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CHAPTER VI

DEVELOPMENT OF PROPOSED MINIMUM PRICES

THE setting of minimum prices was separated by the Bituminous Coal Act of 1937¹ into two distinct stages. *First*, minimum prices were to be proposed by the district boards for their respective districts. In these deliberations, as will be shown later, little or no consideration was given to the competitive relationship of the coals of a given district to those of other districts. *Second*, coordinated minimum prices were to be worked out by the district boards or by the Commission. In this stage of the price-fixing procedure the purpose was to modify the proposed or uncoordinated minimum prices in such a way as to achieve a proper competitive relationship between the coals of the various districts.

This chapter will deal with the first stage: the development of proposed minimum prices by the district boards for their respective districts. It will describe how the *differentials* proposed between sizes of coal and between grades of coal were arrived at and how the *level* of proposed minimum prices was determined.

A. *Criteria to Be Used in Developing Proposed Minimum Prices*

The Act provided that "each district board shall, from time to time on its own motion or when directed by the Commission, propose minimum prices free on board transportation facilities at the mines for kinds, qualities, and sizes of coal produced in said district, and classification of coal and price variations as to mines, consuming market areas, values as to uses and seasonal demand." (Sec. 4-IIa.) In establishing these prices, the boards had to observe certain standards or criteria. The uncoordinated minimum prices were: to yield a return per net ton which for a given district would be equal as nearly as may be to the weighted average of the total costs per net ton of the tonnage of the minimum price area in which it was located; to reflect, as nearly as possible, the relative market value of the various kinds, qualities, and sizes of coal; to be just and equitable as between producers within the district for any kind, quality, or size of coal for shipment into any consuming market area; to have due regard to the interests of the consuming public; and to preclude dumping. (Sec. 4-IIa and b.) In determining these prices the boards were to use a procedure which conformed with the rules and regulations approved by the Coal Division.

¹ 50 U.S. Stat. at L. (1937), 72. See Appendix G below.

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Two of the terms used in this statement of criteria, "relative market value" and "dumping," need some explanation. Proposed prices were to reflect "relative market value" and be just and equitable as between producers within a district "for any kind, quality, and size of coal for shipment into any consuming market area." The Act did not say what is meant by "relative market value." The most plausible interpretation would seem to be that the minimum prices f.o.b. mine were to reflect the prices at which various coals in a given market would have to sell at consumers' plants in order to be on an equal competitive basis with each other. In that event—since the requirements or preference of consumers, competition with other fuel, and similar factors influencing the value of coal may vary by markets—coal of the same kind and quality and of the same size might carry several prices, depending on the number and character of the markets served. Actually, except in the case of two western districts to be noted later, price differentials for specific markets were not proposed at this stage of the price-fixing procedure. Instead, coal of the same kind, quality, and size was assigned one price irrespective of the market to which the coal was shipped. This price was an f.o.b. mine price which presumably reflected both average costs and general market considerations.

The comments of Ellery B. Gordon and William Y. Webb on the meaning of "relative market value" and the difficulties involved in attempting to relate it to proposed minimum prices are of interest:

"'Relative market value,' on the other hand, is concerned with differentials in price, rather than with price levels, and its relation to the cost of production is only indirect. The interpretation of the term revolves around the problem of proposing price differences that will properly and equitably reflect the relative market values of different kinds, grades, and sizes of coal. This does not mean necessarily that the differences which existed under unrestricted competition will reflect relative market value when prices are fixed. . . .

"In the extremely complicated picture presented by the multiplicity of mines classified in a considerable number of quality groups and with a number of coal size groups, all seeking markets in many consuming areas, the task placed on the district boards of showing that the proposed prices reflect relative market values under any exact interpretation of the term would be tremendous. It has been contended that in consideration of the other standards in the act, the best evidence of compliance with the 'relative market

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value' standard would be a showing of the actual market relationships in a recent past period, with an explanation of any substantial departure from those relationships. Such departure in some cases might be occasioned by a regard for the other standards imposed by the act, such as that proposed prices shall 'be just and equitable as between producers . . . and shall have due regard to the interests of the consuming public.' However, it was found impractical to rest any conclusions on the showing of past invoices and spot orders, analyses of both for middle western districts having been made by the statistical and research sections. It was apparent that such records were not reliable or sound as a basis of judgment or criticism of coordinated prices. Such records were available for only a few months' period. They reflected not a pattern of generally existing spreads between sizes and qualities, but instead they showed the absence of any pattern, the 'bargaining power of particular consumers, the usual presence of certain sizes, practices which might probably be called dumping, attempts to raid territory by price cutting, and other factors and practices of the same sort.' The 'relative market value' standard, in the present situation, rests very largely therefore on judgment and experience. Although the authorities may be guided to some extent by study of price relations in the recent past, it appears that they do not regard these price relations as a necessarily correct measure of quality relations."²

"Dumping" had to do with the practice of selling, primarily a fine size or sizes, at prices which would insure total sales at less than total costs. No size of coal can be produced without a resultant and resultants must be moved so that railroad cars are not left standing on sidings.³ Because the resultant of one group of mines may be the primary size of other mines, the dumping of a resultant may materially affect the markets of the producers whose major output happens to be similar to it. The elimination or careful regulation of dumping is necessary to maintain the structure of minimum prices. Gordon and Webb point out:

"No general formula can be given. Low prices which in one market constitute dumping may, in another market taking the same freight rate, be entirely explained by interfuel competition. Under a marketing rule providing for appropriate procedure and approval

² "Price Fixing in the Bituminous Coal Industry," *Economic Standards of Government Price Control*, Monograph No. 32 (Temporary National Economic Committee, 1941), Part III, pp. 291-92.

³ For definition of "resultant" see note 17 below.

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by a district board, 'distress' sales may be made at less than the established minimum prices. Each case must be examined individually and determined on its merits. Criteria to define dumping will not be easily and simply developed."⁴

B. *Producers' Price-Fixing Agencies*

The proposal of uncoordinated minimum prices was the responsibility of the district boards. Except for the labor member who was appointed by the miners' union which acted in behalf of the preponderant number of employees in the district (in all cases the United Mine Workers of America), the personnel of the boards was composed of Code members representing the various sections of the district. The producer members of the board were usually officers or high-ranking executives who had had a long experience in the industry and an intimate knowledge of the coals produced and of the prevailing price relationships within the district. Because of the nature of the task many of the members chosen were men who had marketing experience. The membership of the 22 boards varied by district. Under the terms of the Act the boards were to be composed of an odd number of members and were to have a membership of not less than three nor more than 17. Except in the smaller districts the membership of the boards tended to approach the maximum limit.

Ten of the 22 district boards performed the task of classifying and pricing coals in their respective districts. Twelve boards, however, appointed committees to undertake or to assist them in doing this work. In Indiana the board was assisted by four advisory committees, one of which dealt with all coals in the district which passed through a two-inch screen, and three advised the board on problems pertaining to particular veins or seams of coal. The remaining 11 districts appointed technical advisory or special classification and price-fixing committees. The number of members and the composition of these committees varied greatly. For example, the technical advisory committee of Eastern Pennsylvania consisted of two members who had a wide range of experience in the mining and sampling of coals and in their preparation, analysis, and classification, while the advisory committee of the Southwestern District (Kansas, Missouri, Texas, and part of Oklahoma) was composed of 15 members, 11 of whom were sales executives. The functions performed by these committees also varied considerably. In Ohio both the coal classification and the schedule of proposed mini-

⁴ *Op.cit.*, p. 292.

imum prices were prepared by the price and classification committee under the general direction of the district board. In Western Pennsylvania the marketing and classification committee not only prepared the classifications and price schedules but held hearings on protests by Code members and submitted its revised schedules to the district board for its approval. Some of the district boards, on the other hand, restricted the duties of their technical committee. Thus in Eastern Pennsylvania, the board itself determined the number of size and quality classes to be used and the price spreads between sizes and grades and assigned the task of working up price schedules within this framework to its technical advisory committee.

C. "*Kinds, Qualities, and Sizes*" of Coal

Under the Act, variations in the chemical and physical characteristics of bituminous coal as well as differences in sizes and the uses to which it is to be put were to be expressed in price differentials which reflected "relative market values" and were "just and equitable as between producers within the district." For this reason and because coal is such an exceedingly complex organic substance, it may be useful to examine the more important characteristics of coal before proceeding with the discussion of coal classification and the determination of uncoordinated minimum prices.

1. KINDS AND QUALITIES

American coals are grouped by geologists into four general *classes*: anthracite, bituminous (including semi-bituminous), sub-bituminous, and lignite. The Bituminous Coal Act of 1937 applies only to the coals classified as bituminous and sub-bituminous.⁵ As used by the Act, the term "bituminous coal" embraces a number of coals that vary in chemical composition, physical structure, and burning characteristics. The geologist classifies them on the basis of the moisture, and fixed carbon and volatile matter content, or the calorific value expressed in British thermal units. On this basis the coals commonly designated as bituminous are ranked as low-volatile, medium-volatile, high-volatile A, high-volatile B, and high-volatile C, and the sub-bituminous as A, B, and C.⁶ It should be pointed

⁵ The Act states, "The term 'bituminous coal' includes all bituminous, semi-bituminous, and sub-bituminous coal and shall exclude lignite, which is defined as a lignitic coal having calorific value in British thermal units of less than seven thousand six hundred per pound and having a natural moisture content in place in the mine of 30 per centum or more." (Sec. 17b.)

⁶ The classification by rank is that proposed by the American Society for Testing Materials on the recommendation of a committee of the American

out that the border lines between the several *ranks* are not very clear and that the coals in any one rank are far from uniform. The analytical limits and requisite physical properties for the various ranks of American coals are given in Table 14.

Chemical analysis reveals differences in coals that affect their burning characteristics—important variations with respect to such factors as the moisture, sulphur, ash, phosphorus, fixed carbon, and volatile matter as well as heat value and fusibility and quantity of ash. Other characteristics of coals which affect their suitability for certain uses but are not yet subject to exact measurement include friability, grindability, and free-burning, coking, and caking qualities. There are also unknown factors involved: some coals that have almost the same analyses and practically the same physical characteristics do not burn in the same manner. The great variations in the coal within a given rank have led a committee of the American Standards Association, Inc., to establish a classification of coal by *grades*. It has grouped coals with respect to (1) their size, (2) the calorific value (as delivered) in Btu expressed to the nearest hundred, (3) the amount of ash, (4) the temperature at which the ash softens, and (5) the amount of sulphur. This classification of coal by grades is still tentative and has not been generally accepted by the industry.

In the commercial market, bituminous coal is commonly classified on the basis of the *use* to which it is put, such as domestic (mostly household), steam, gas, bunker, coking, by-product, and smithing. Certain coals may fall into several use classes, each of which may be subdivided to meet consumers' requirements or preferences and the type of burning equipment utilized. Finally, an effort is now being made to classify coal by *types* such as common banded coal, splint coal, cannel coal, and boghead coal.⁷ In the

Standards Association, Inc. The scheme of classification is based on fixed carbon and calorific value (expressed in British thermal units) calculated to the mineral-matter-free basis. The percentage of fixed carbon is important because carbon has very high value as a producer of heat and because it accounts for the mass of the coal after the moisture, volatile matter, ash, and other constituents are removed. The British thermal units (Btu) indicate the amount of heat that can be generated by burning the coal. (*Proceedings of the 39th Annual Meeting of the American Society for Testing Materials*, 1936, Part 1, pp. 812-18.)

⁷ These are tentatively defined in the *Proceedings of the 41st Annual Meeting of the American Society for Testing Materials*, 1938, Part 1, p. 915. These definitions apply only to commercial varieties of bituminous and sub-bituminous coals.

TABLE 14
Classification of American Coals

| Class | Group | Dry Contents ^a (per cent) | | British Thermal Units ^a (Moist) ^b | Requisite Physical Properties |
|-------------------------|------------------|--------------------------------------|-----------------|---|---|
| | | Volatile Matter | Fixed Carbon | | |
| Anthracitic | Meta-anthracite | 0 to 2 | 98 and over | c | |
| | Anthracite | Over 2 to 8 | 92 and under 98 | c | |
| | Semi-anthracite | Over 8 to 14 | 86 and under 92 | c | |
| Bituminous ^e | Low-volatile | Over 14 to 22 | 78 and under 86 | c | |
| | Medium-volatile | Over 22 to 31 | 69 and under 78 | c | |
| | High-volatile A | Over 31 | Under 69 | 14,000 and over | |
| | High-volatile B | | | 13,000 and under 14,000 ^f | |
| | High-volatile C | | | 11,000 and under 13,000 | Non-agglomerating ^d |
| Sub-bituminous | Sub-bituminous A | | | 11,000 and under 13,000 | Either agglomerating or non-weathering ^g |
| Lignitic | Sub-bituminous B | | | 9,500 and under 11,000 | Both agglomerating and non-weathering |
| | Sub-bituminous C | | | 8,300 and under 9,500 | |
| | Lignite | | | Under 8,300 | Consolidated |
| | Brown coal | | | Under 8,300 | Unconsolidated |

^a On mineral-matter-free basis.

^b Moist Btu refers to coal containing its natural bed moisture but not including visible moisture on the surface of the coal.

^c Coals having 69 per cent or more fixed carbon on the dry, mineral-matter-free basis shall be classified according to fixed carbon, regardless of Btu.

^d If agglomerating, classify in the low-volatile group of the bituminous class.

^e It is tentatively recognized that there may be non-caking varieties in each group of the bituminous class.

^f Btu are expressed to the nearest hundred.

^g In this group there are three varieties: (1) agglomerating and non-weathering; (2) agglomerating and weathering; and (3) non-agglomerating and non-weathering.

Source: Used with permission of the American Society for Testing Materials. This classification was adopted in 1937 and incorporated without change in the 1938 Standard Specifications for Classification of Coals by Rank (ASTM Designation D 388-38), 1952 *Book of ASTM Standards*, Part 5, p. 873.

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United States the only types in general use are splint coal and cannel coal.

These differences in chemical composition, physical structure, burning characteristics, and in uses to which best suited are found not only between seams but in the same seam and sometimes in the same mine.

This discussion of the characteristics of bituminous coal has been in terms of classes, ranks, grades, and types rather than of "kinds and qualities" for which, it will be recalled, district boards were to propose minimum prices. The Act unfortunately did not define these terms and the hearings held by the Commission and the Division failed to disclose any clear-cut distinction. As will be shown later, five district boards specifically listed "qualities" as one of a number of factors considered in classifying their coals but apparently none of them attempted to define its meaning. As a general rule "kinds and qualities" appears to have been considered as a convenient label under which to include all factors other than size that determine value of coal. It is recognized, of course, that kinds and qualities of coal cannot be appraised and evaluated apart from size.

2. SIZES OF COAL

Coal as it comes from the mine without screening or preparation is called "mine run" and is sometimes sold in that form.⁸ To satisfy the consumers, however, or because the added price commanded by the large sizes more than offsets both the lower price of the smaller sizes and the cost of screening, the producer commonly passes his mine-run coal over screens of different types having openings of various shapes and sizes. The variety of commercial sizes is surprisingly large, depending upon the consumers' preferences or needs, the physical characteristics of the coal, and efforts to expand markets and decrease sales resistance. The broad classes, in order of size, are lump or block, egg, nut, stoker, and slack or screenings. Sometimes, however, a single mine may produce and sell forty or more sizes. As shown in Table 15, the number of sizes produced in 1937 varied greatly from district to district. Fortunately the size classifications approved for the districts by the Division combined the many sizes into a limited number of size groups. (For an example see Table 18.)

⁸ Some producers screen and wash their coal and then reassemble it and sell it as "mine run."

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TABLE 15

Number of Sizes of Bituminous Coal Produced, by Producing District, 1937

| Producing District | Total Sizes | <i>Measures of Concentration of Sizes</i> | |
|-----------------------------|----------------|---|--|
| | | <i>Sizes Made by 10 Per Cent or More of Mines</i> | <i>Tonnage of Dominant Size in Each District as Per Cent of Total Tonnage in Each District</i> |
| 1 Eastern Pennsylvania | 105 | 6 | 65 |
| 2 Western Pennsylvania | 98 | 11 | 64 |
| 3 Northern West Virginia | 115 | 20 | 54 |
| 4 Ohio | 63 | 12 | 67 |
| 5 Michigan | 10 | | 94 |
| 6 Panhandle (West Virginia) | 52 | 27 | 68 |
| 7 Southern Numbered 1 | 118 | 12 | 63 |
| 8 Southern Numbered 2 | 169 | 20 | 62 |
| 9 West Kentucky | 59 | 18 | 75 |
| 10 Illinois | 126 | 23 | 56 |
| 11 Indiana | 81 | 24 | 48 |
| 12 Iowa | 35 | 13 | 82 |
| 13 Southeastern | 63 | 12 | 60 |
| 14 Arkansas-Oklahoma | 65 | 12 | 47 |
| 15 Southwestern | 72 | 13 | 75 |
| 16 Northern Colorado | 16 | 13 | 86 |
| 17 Southern Colorado | 46 | 13 | 65 |
| 18 New Mexico | 34 | 17 | 65 |
| 19 Wyoming | 40 | 20 | 53 |
| 20 Utah | 22 | 14 | 89 |
| 22 Montana | 25 | 13 | 77 |
| 23 Washington | 69 | 14 | 44 |

Source: Thomas Fraser, W. L. Crentz, and F. G. Tryon, "Sizes and Grades of Coal Produced in the United States in 1937" (mimeographed report), Bituminous Coal Division, n.d.

D. Price-Fixing Procedure

Congress specifically assigned to the boards in the several districts a two-fold task with respect to the development of uncoordinated minimum prices. It instructed them to propose (1) classifications of coal and price variations as to mines, consuming market areas, values as to uses, and seasonal demand, and (2) minimum prices, f.o.b. the mine, which conformed with the criteria laid down in the Act.

In carrying out this assignment the boards (1) classified coals by kinds and qualities, sizes, and in some instances, uses of coal, and special coal preparation other than screening, (2) proposed price spreads or differentials between the sizes and grades of coal as classified, and (3) reviewed and adjusted price differentials

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where necessary so that they would give rise to a realization per net ton which for a given district would equal "as nearly as may be" the weighted average of the total per net ton costs of the minimum price area in which it is located. Theoretically these three functions might have been undertaken separately and consecutively. The boards did not do this. To enable the reader more easily to comprehend the magnitude of the task and to understand the involved procedures used by the boards, this analysis of classifying and pricing procedures will adhere to the above threefold classification of functions.

1. CLASSIFYING PROCEDURES

Considerable disagreement existed over what Congress meant by "classification of coal." Some persons held that it applied to the process of grouping like coals and that the basis of classification should have been the intrinsic qualities of the coal. Others pointed out that since the significance of any factor in coal analysis and the importance and accuracy of sizing vary with the uses to which coal is put, classification should have grouped the coals on the basis of all three factors; namely, intrinsic qualities, size, and use to be made of the coal.⁹

In its Order 38 of August 16, 1937, directing district boards to classify their coals, the Commission instructed them to "consider as pertinent" and give "due consideration" to the following factors: 1) Proximate analyses; namely, moisture, ash, volatile matter, fixed carbon and sulphur, Btu's and ash-softening temperature, analysis of ash and ultimate analysis of coal. 2) Physical characteristics. 3) Characteristics of performance.¹⁰ To clarify this Order the Commission said:

"Classification as intended under Order #38 of the Commission is not to be confused with the proposal of prices, nor with price variations which, under the language of the Act, may be involved in such price proposals. The word 'classification' may be defined as a systematic arrangement in groups or categories according to some definite plan or sequence. We are not engaged in any classification

⁹ Roger N. Quirk, "Regulation of the Bituminous Coal Industry in the United States" (preliminary edition, mimeographed, June 1939), p. 93.

¹⁰ *Federal Register*, August 18, 1937, p. 1412. The use of "proximate analysis" in this quotation departs from standard terminology, for which see note 36 below. Physical characteristics presumably referred to such factors as appearance, structure, friability, size, and nature of the ash; and characteristics of performance referred to the coking, caking, or free-burning qualities of coal.

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of coals for scientific purposes nor are we concerned with the listing of coals for any particular purpose or for any particular types of equipment. The classification which is to be made at this time is, therefore, a grouping of coals which have common physical, chemical and performance characteristics."¹¹

The Commission made it clear that no consideration should be given at this stage of the price-fixing procedure to "values as to uses" or "market history and sales experience," both of which had been recommended by various district boards.

In September 1937 some districts submitted classifications of their coals. In most instances, they were admittedly inadequate. In a number of cases, however, they were reflected in the classifications finally proposed. The pressure upon the Commission for an early establishment of minimum prices led it to telescope the procedure for classification and pricing. This action, together with the failure to give consumers an opportunity to present their case at a public hearing, criticism to the effect that the Commission had failed to live up to the terms of the Act, and finally a series of injunctions issued by the United States Court of Appeals of the District of Columbia which set aside the price schedules for specified consumers led the Commission, on February 25, 1938, to revoke the entire price schedule¹² and later the directions for classification which it had issued up to that time.

In its second attempt to obtain uncoordinated minimum prices, the Commission was more cautious in framing its instructions concerning the factors to be considered and the procedure to be followed. Its Order 245, instead of listing specific factors as did the initial order in 1937, recapitulated the price-fixing provisions of the Act and instructed the Boards to observe certain general rules and regulations, which may be summarized as follows:

Each district board was to submit to the Commission within 25 days a schedule of minimum prices, together with all the data upon which they were computed, including the factors considered in determining price relationships.

All prices proposed by the boards were to be f.o.b. transportation facilities at the mine.

Each board should transmit its schedule of minimum prices to each code member 15 days before filing the schedule with the Commission.

¹¹ Quoted by Quirk, *op.cit.*, p. 101.

¹² Order 230, *Federal Register*, February 26, 1938, p. 469.

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During the interim the board might receive protests from code members and make such changes in its schedule as it deemed proper.

The schedule of prices so revised should be transmitted to each code member not later than the date of submission of the proposed schedule to the Commission.

Each board should file 100 copies of the final schedule of proposed prices with the Commission, and transmit five copies to each of the other district boards.

The schedules submitted by each board (to be tabulated in conformity with an outline suggested by the Commission) should contain an alphabetical list of code members, names of mines, subdistricts, seams, classifications, size groups, etc.

Each schedule should include a clause to the effect that the proposed prices were not the final prices which would be established, but were subject to increase or decrease as might be required in the coordination process.¹³

To insure uniformity of presentation of classification data and prices, the Commission included in its order a sample schedule to be used by district boards. Table 16 gives a clear picture of the

TABLE 16
Sample Schedule upon Which Uncoordinated Price Schedules
Were to be Patterned

| Alphabetical List of Code Members Showing Price Classifications by Sizes for All Uses Except as Separately Shown | | | | | | | | |
|---|-------|------------------|-------|-------------|---|---|---|---|
| Company | Mine | Sub- District | Seam | Size Groups | | | | |
| | | | | 1 | 2 | 3 | 4 | 5 |
| Adams Coal Co. | Black | Coal | No. 8 | A | B | C | D | E |
| Jones Coal Co. | White | Coke | No. 6 | B | C | B | A | B |
| Smith Coal Co. | Red | Iron | "B" | E | D | C | E | A |
| Williams Coal Co. | Green | Glass | "E" | G | G | G | G | G |

| Prices Applicable (dollars per net ton, f.o.b. mine) | | | | | |
|---|-------------|------|------|------|------|
| Classification | Size Groups | | | | |
| | 1 | 2 | 3 | 4 | 5 |
| A | 2.75 | 2.65 | 2.55 | 2.45 | 2.35 |
| B | 2.65 | 2.55 | 2.45 | 2.35 | 2.25 |
| C | 2.55 | 2.45 | 2.35 | 2.25 | 2.15 |

Source: *Federal Register*, August 2, 1938, pp. 1895-96.

¹³ *Federal Register*, August 2, 1938, pp. 1895-96.

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type and arrangement of data required by the Commission. The classification data were to be presented alphabetically by companies. Opposite each company's name the boards were asked to specify the name of the mine, the subdistrict in which it was located, and the seam worked or kind of coal produced. The coals of each mine were to be grouped by sizes, and the quality ratings assigned by the Board were to be indicated by letters—A the highest, B the next, C third quality, etc. These letter ratings were to be uniform within the district, but not necessarily between districts. This statement is also true of the size groups used.

It will be observed that the coal from any one mine did not have to (and as we shall see later usually did not) carry the same grade letter (price classification) for all sizes. This variation may be explained in part by the fact that most of the boards considered market experience as well as the physical and chemical characteristics of coal. As a consequence, such factors as "consumer acceptance" or "market history" may have led the board to assign different quality ratings for different sizes of the same coal. Another element is the fact that coal in the seam is not necessarily homogeneous chemically and physically. Some parts, having one character, may break up readily, while other parts may not. It is possible, at a given mine, that the lump and egg sizes might be very low in ash content but the screenings would have a much higher ash content and be much higher in sulphur content. Occasionally the fusion temperature is different between sizes. On the other hand, there are mines in which the slack of coal is of better quality than the large sizes. Different quality ratings for the different sizes may result from differences in hardness, friability, and coking, caking, or free-burning qualities, none of which is shown in chemical analysis. To illustrate: a mine with a friable coal may have relatively inferior large sizes and at the same time excellent industrial sizes. Finally, the type of burning equipment of the consumer or the use to be made of the coal may make the same coals more valuable in certain sizes than in others.

In developing their coal classifications, most district boards took into consideration "kinds, qualities, and sizes" of coal. Some of them, however, also took into account a number of other related factors. The following analysis of the procedures used and the problems involved in coal classification will consider first, classifications by size and other nonquality factors, and second, classifications by kinds and qualities.

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a. *Classifications by size and other nonquality factors.* An examination of the size schedules submitted to the Commission discloses that a number of districts resorted to more than one basis of classification. Altogether four bases were used: the size of the coal, that is, run-of-mine coal or coal after it had been run over screens of various shapes and sizes; the method of mining used underground, that is, whether coal is shot off the solid or undercut; the special preparation given coal in addition to screening, such as washing, air cleaning, crushing, etc.; the use made of the coal, that is, for such special purposes as smelting, the manufacture of water gas, the manufacture of by-product coke, etc., but not for domestic (household) use.

Table 17 presents both the actual number of size groups and the number of so-called "size groups" for each of the other non-quality factors in each district. Examination of this table reveals that all districts proposed size groups for mine-run and screened coal, ranging in number from 5 to 25. In addition, one district established special size groups for some of its coals on the basis of the method of mining used, five on the special preparation given the coal, and nine on the use made of the coal. Each of these bases needs further elaboration.

1) *Classification by actual size group.* The price of coal varies with its size. For this reason and to serve a diversified group of buyers, operators screen their coal whenever conditions permit. The number of run-of-mine and screen sizes with which a given board had to work depended on such factors as the preferences and needs of the consumers served by the district, the screening machinery in use, and the physical characteristics of the coal.¹⁴

Once the number of mine-run and screened sizes produced in the district had been ascertained, the board had the problem of classifying them, that is, of grouping closely related sizes of coal so that price differentials reflecting size might be established. The largest number of such size groups that any district might require was the number of sizes produced. The minimum number was the smallest number of size groups that would not throw together coal

¹⁴ Consumers' needs and preferences in coal sizes are determined in a large measure by the types of burning equipment in which the coals are consumed. Industrial furnaces (stoker fired) commonly require small, and house heaters (hand fired) large, sizes. The largest size a given district can produce depends upon such physical characteristics of coal as hardness and friability.

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TABLE 17

Number of Groups Proposed on Basis of Size and Other Nonquality Factors, by Producing District, 1939

| Producing District | Size Groups (Mine Run and Screened Coal) | Other Nonquality Factor Groups | | | Total |
|-----------------------------|---|--------------------------------|--|----------------------------|-----------------|
| | | Mining Methods | Special Preparation of Coal ^a | Special Uses of Coal | |
| 1 Eastern Pennsylvania | 5 | | | | 5 |
| 2 Western Pennsylvania | 12 | | | 4 | 16 |
| 3 Northern West Virginia | 5 | | | 2 | 7 |
| 4 Ohio | 11 | | | | 11 |
| 5 Michigan | 19 | | 1 | | 20 |
| 6 Panhandle (West Virginia) | 12 | | | | 12 |
| 7 Southern Numbered 1 | 10 | | | | 10 |
| 8 Southern Numbered 2 | 23 | | | 8 | 31 |
| 9 West Kentucky | 21 | | | | 21 |
| 10 Illinois | 18 | | 8 | | 26 |
| 11 Indiana | 12 | | 6 | | 18 |
| 12 Iowa | 9 | | 1 | | 10 |
| 13 Southeastern | 19 | | | 1 ^b | 20 |
| 14 Arkansas-Oklahoma | 15 | 3 | | 3 | 21 |
| 15 Southwestern | 13 | | 2 | 6 ^c | 21 ^c |
| 16 Northern Colorado | 13 | | | | 13 |
| 17 Southern Colorado | 17 | | | | 17 |
| 18 New Mexico | 15 | | | 1 | 16 |
| 19 Wyoming | 14 | | | | 14 |
| 20 Utah | 15 | | | | 15 |
| 22 Montana | 12 | | | 2 | 14 |
| 23 Washington | 25 | | | 1 | 26 |

^a Other than initial screening.

^b This size group represents a combination of sizes. It refers to coal above 1 inch bottom size sold for production of power, ceramic purposes, and production of gas.

^c In this district three additional size groups were, in effect, created by a system of assigning lower grades to certain size groups when sold for industrial use rather than for domestic and commercial use.

Source: *Federal Register*, December 14, 1938, pp. 2918-62; December 22, 1938, pp. 3077-3108; January 11, 1939, pp. 120-55; January 12, 1939, pp. 195-217; January 19, 1939, pp. 277-343; February 8, 1939, pp. 548-78; February 28, 1939, pp. 1048-78.

sizes which in a given market normally carry different prices. For price-fixing purposes, the number of size groups had to be kept small, but not so small as to disturb the generally accepted market relationships between the various sizes.

Not infrequently the boards were confronted with a multiplicity of mine-run and screened sizes some of which did not reflect real variations in commercial utility. This diversity may be explained, at least in part, by high-pressure selling which leads operators to resort to refinements of sizing and grading, not for the purpose of

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satisfying an existing demand, but as a selling device to increase their volume of sales at the expense of their competitors.¹⁵

The wide variety in the number of size groups proposed by the district boards is shown below:

| <i>Size Groups</i> | <i>Districts</i> |
|--------------------|------------------|
| 0 to 7 | 2 |
| 8 to 14 | 7 |
| 15 to 21 | 10 |
| 22 and over | 3 |
| Total | <u>22</u> |

It is apparent that there is considerable variation in the number of size groups even when bases other than size alone are eliminated.

The size classification (run-of-mine and screened coal) of District 2 is shown in Table 18. Some sizes show only one limit such as 4" and others two limits as 1½" × 4". As the coal is run over a series of sieve-like "screens" which vibrate or rock mechanically from end to end, the large pieces pass over the top set of screens. This coal has only a lower size limit which is indicated as 5" lump, 4" lump, or 3" lump, depending upon the size of the openings of the first set of screens. The coal that runs through the first set of screens but passes over the second, or through the second and over the third, etc., is described by two limits such as 3" × 6" or 3" × 7" stove, or 1" × 3" nut. All coal with two limits is called "double screened" coal. The coal which passes through the last set of screens, unless it is rescreened, has no lower limit. Such coal is referred to in the industry as being the size of the last screening by zero or minus the size of the last screening. For instance, coal which passes through a screen with ½" holes would be designated either as "½" × 0" or "½". (See Figure 2.)¹⁶

¹⁵ Roger N. Quirk points out two practices which fall into this category. To secure new business, operators in the past offered to buyers, at a price normally asked for the standard size, coal that has been run through screens, the openings of which have been slightly enlarged. An analogous practice is that of removing a certain percentage of fine coal from the mine-run coal and selling this modified mine-run at mine-run prices. To maintain their competitive advantage these operators naturally sought to include these odd sizes in the classifications to be adopted by the board. (*Op.cit.*, pp. 109-10.)

¹⁶ Figure 2 has been prepared to aid the nontechnical reader in visualizing these relationships between screen openings and coal sizes. For a detailed discussion of the subject see E. A. Holbrook and Thomas Fraser, *Screen Sizing of Coal, Ores and Other Minerals*, Bulletin 234, U.S. Bureau of Mines, 1925.

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TABLE 18

Size Classification in Western Pennsylvania, 1939

| Size Group | Description of Size Group |
|-----------------|---|
| 1 | <i>Lump coal</i> having bottom size larger than 4", and <i>Double screened coal</i> with bottom size 4" and over and top size 6" and over. |
| 2 | <i>Lump coal</i> having bottom size larger than 3" but not over 4", and <i>Double screened coal</i> with bottom size 4" and over and top size not over 6". |
| 3 | <i>Lump coal</i> having bottom size larger than 2" but not over 3", and <i>Double screened coal</i> with bottom size 2" and over but not exceeding 3" with top size 5" and over. |
| 4 | <i>Lump coal</i> having bottom size larger than 1½" but not over 2", and <i>Double screened coal</i> with bottom size over 2" if top size does not exceed 5", also double screened coal with top size over 5" if bottom size does not exceed 2". |
| 5 | <i>Lump coal</i> having bottom size of 1¼" and under, and <i>Double screened coal</i> with top size over 4" but not exceeding 5" if bottom size does not exceed 2", also double screened coal with top size not exceeding 4" and bottom size 1½" and larger but under 3". |
| 6 | <i>Double screened coal</i> with top size over 2" but not exceeding 4", and bottom size 1½" and under. |
| 7 | <i>Double screened coal</i> with top size not exceeding 2". |
| 8 | <i>Straight run-of-mine, modified run-of-mine, and resultant coals</i> over 2". |
| 9 | <i>Resultants</i> with top size larger than 1¼" but not exceeding 2". <i>Nut and slack.</i> |
| 10 | <i>Resultants</i> with top size larger than ¾" but not exceeding 1¼". <i>Nut and slack.</i> |
| 11 | <i>Resultants</i> with top size larger than ½" but not exceeding ¾". <i>Slack.</i> |
| 12 | <i>Resultants</i> with top size not exceeding ½". <i>Slack.</i> |
| 13 ^a | FOR RETORT- AND WATER-GAS PLANTS ONLY <i>Lump</i> larger than 2" and <i>Double screened coal</i> 2" × 5" and over, either top or bottom size. |
| 14 ^a | FOR RETORT- AND WATER-GAS PLANTS ONLY <i>Lump</i> , 1½" and 2", and <i>Double screened coal</i> top size under 5" and bottom size 2" and under. |
| 15 ^a | FOR RETORT- AND WATER-GAS PLANTS ONLY <i>Lump</i> , 1¼" and under. |
| 16 ^a | FOR BY-PRODUCT PLANTS ONLY <i>Run-of-mine, resultant run-of-mine, nut and slack coal, and slack coal.</i> |

^a Size group for special use of coal.

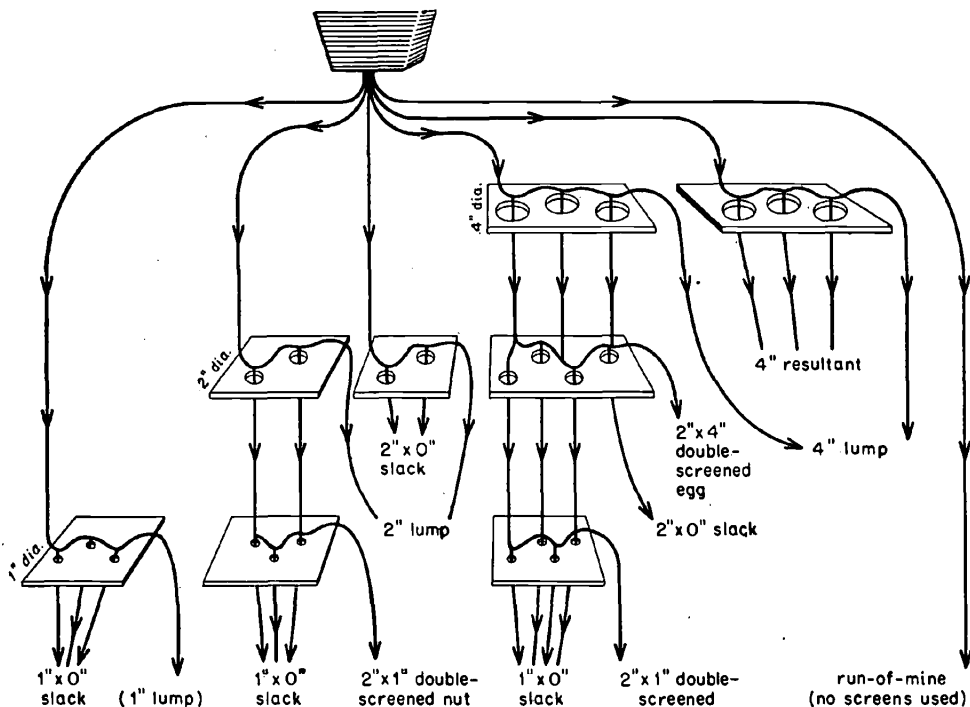
Source: *Federal Register*, January 11, 1939, p. 124.

The sizes with only a lower limit are usually confined to lump or block coal; the double-screened sizes include a wide variety such as chunks or small lumps, stove or grate, egg, nut, pea, and stoker;

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FIGURE 2

Illustration of Screening Process



and the sizes with no lower limit consist largely of slack coal or screenings and resultants.¹⁷

2) *Classification by mining method.* In District 14 (Arkansas-Oklahoma) the district board distinguished between coals undercut by machine and those shot off the solid, that is, blasted down without undercutting. Less than 12 per cent of the coal is shot off the solid in this district and, because this method of mining produces an excessive amount of small coal and slack, the board presumably found it advisable to set up three special size groups for coal mined by this method.

3) *Classifications by values as to uses.* The Act provided that "classification of coal and price variations as to . . . values as to uses" were to be proposed by each district board. The phrase

¹⁷ A "resultant" may be defined as the coal remaining after all sizes above a certain size have been removed.

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"values as to uses" occasioned considerable controversy as to (1) its meaning, (2) the stage of the price-fixing process at which it should receive attention, and (3) the manner in which it should be considered in the price-fixing process.

a) *Lack of agreement on definition.* Two very different interpretations have been placed on "values as to uses." The Consumers' Counsel and some operators held that the phrase referred to the utilization value of coal and suggested that it be elaborated to read "uses for which the coal is best fitted." The Coal Commission and most operators, on the other hand, took the position that "values as to uses" applied to the particular use to which a given consumer intends to put his coal after sale and delivery. The first group would classify *coals* on the basis of the uses to which—because of their inherent properties—they were capable of being put, and the second group would classify *sales to consumers* on the basis of the use actually made of the coal.

b) *Disagreement as to stage of price-fixing process at which values as to uses should receive attention.* Although the Act stated that "classification of coal and price variations as to . . . values as to uses" were to be proposed by each district board, the Commission in its Order 38, which laid down the bases of classification for the first attempt at price fixing, deliberately omitted any references to values as to uses, and thereby implied that values as to uses were not to be considered in the classifying process. In this interpretation the Commission received the support of the Consumers' Counsel. Many operators, however, insisted that the Commission's ruling was in violation of the Act. When uncoordinated price schedules including use classes were submitted by a number of district boards, the Commission rejected them.

In its second attempt to establish uncoordinated minimum prices, in the summer of 1938, the Commission reproduced the price-fixing provisions of the Act and made no comments as to the stage at which or the manner in which values as to uses were to be considered. Each district board, therefore, was free to make its own interpretation of the provisions of the Act with respect to use classifications. As will be seen later, this procedure for dealing with the "values as to uses" provision of the Act has been severely criticized.

c) *Controversy over the manner in which values as to uses should be considered in pricing process.* The Consumers' Counsel

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pointed out that the Act stated that minimum prices were to be proposed "for kinds, qualities and sizes of coal" and did not state that separate prices were to be established for the different uses to which coal may be put. The Office of the Counsel added, "When the producer is required to charge a consumer more for his coal if he is going to use it to make coke than if he is going to use it to make steam, the Coal Division goes beyond the requirements of the Act." It maintained that the Division was not compelled to do so by the provision of the Act which required that the coordination shall "take into account values as to uses" nor by the provision that the district boards should "propose . . . classification of coal and price variations . . . as to values as to uses." It further stated that:

"To take values as to uses into account in fixing prices is not the same as to fix a different price for a different use. Prices may be varied as to values as to uses without fixing a separate price as to each use.

"Thus, suppose one mine produces coal of such a size, kind and quality that it is useful for by-product, domestic, or steam use, and that another mine produces coal of such a kind, size and quality that it is useful only for steam. In such a situation, the last-mentioned mine has a coal which, because of its fewer number of outlets, should be cheaper because it is harder to sell. The owner of the last-mentioned mine should be permitted to sell his coal for less than the man who can sell it for several uses, for otherwise he cannot compete. Such a differential would fix variant prices for the two kinds or qualities with due regard for their values as to uses. . . .

"However, that is not what the Coal Division proposes to do. Taking the examples cited above, it proposes in some cases to fix a certain price for similar coal from both mines when that coal is to be used for steam, another when it is to be used for by-product, and so on. Then when the first mine sells its coal for steam use, it will sell it at a lower price than if it is to be used for by-product. . . .

"If one of the Examiners went to the bakery on the corner and asked the price of a loaf of bread, he would be amazed if the baker replied, 'Well, it will be 5 cents if you want to make bread pudding out of it, 10 cents if you want to make toast out of it, and 15 cents if you are just going to butter and eat it.' The baker would be fixing separate prices for each use classification as the Coal Division proposes to do, and it wouldn't make sense.

"On the other hand, if the hypothetical Examiner went to the

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hypothetical baker with a similar question he would not be surprised to hear such a reply as: 'We have some fresh bread that you can use to butter and eat, to make toast, or to make bread pudding. We have some one-day-old bread that's good for making toast or bread pudding, and we have some two-day-old bread that's not good for much of anything except making bread pudding. The price for the two-day-old kind and quality of bread is 5 cents, for the one-day-old kind and quality 10 cents, and for the fresh kind and quality 15 cents—and, of course, I don't care what you use it for.' That baker would have varied the prices for the kind and quality of bread in his stock with due regard to its values as to use."¹⁸

The Consumers' Counsel objected vigorously to the policy of differential pricing as to uses, asserting that it was not contemplated by the statute and that it was contrary to the conservation objectives of the Act, in that it encouraged the consumption of coal of superior qualities in a manner that did not utilize those superior qualities nor compensate the coal industry for them.¹⁹ The Consumers' Counsel maintained furthermore that the policy was not conducive to practical and effective administration of the Act, in that it imposed on the producer the responsibility of determining in advance the use to which the coal was to be put before he knew what price to give it.

Moreover, he stated that it was unfair to the interests of the consuming public generally in that it entailed a price discrimination among consumers of different classes in the purchase of the same kind, quality, and size of coal.

Finally he suggested that the complexity of price schedules containing "use classes" might enmesh the Coal Division in extraneous calculations and serve as a cover for preference or discrimination as between consumers.²⁰

The Commission undoubtedly was fully aware of these matters.

¹⁸ *Brief for Consumers' Counsel Division, In the Matter of the Establishment of Minimum Prices for the Coals Produced in Districts Nos. 1 to 20, Inclusive, 22 and 23 (General Docket No. 15)*, Bituminous Coal Division, February 14, 1940, pp. 95-97.

¹⁹ This point, wrote H. N. Eavenson in a letter to the authors, "was very strongly disputed by many in the industry. It is certainly a fact that in District 2 the same prices for various qualities of coal have resulted in the use of high grade by-product coal where steam coal of much lower chemical qualities would have answered the same purpose just as well. The opinion of the Consumers' Counsel in this had a great deal of justification, and it was far from agreeing with the major opinion of the industry." (Letter dated June 12, 1944.)

²⁰ *Brief for Consumers' Counsel Division . . .*, p. 93.

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Its attempt to eliminate consideration of values as to uses in the initial stages of the first determination of coordinated price schedules supports this belief. It must be remembered, however, that the Act required that (1) "district boards should propose . . . classification of coal and price variations as to . . . values as to uses," and (2) the Commission should "take into account values as to uses" in the coordination of district minimum prices. Moreover, the Commission was specifically instructed by the Act not to disrupt the existing relative price structure or to disturb fair competitive opportunities. Evidently the Commission concluded that the discontinuance of special-use prices might provoke opposition in the industry, and perhaps lead to litigation.

d) *Use classes included in size classifications.* Reference to Table 17 will show that nine of the 22 district boards set up special use categories in their classification schedules. Of these, six proposed special size groups for coal sold as railroad locomotive fuel, two for the manufacture of retort- and water-gas, two for the manufacture of by-product coke, two for blacksmithing, one for use in smelting; one for domestic sizes when sold to industrial buyers, and one for ceramic purposes, and for the production of power and gas.

Special price differentials for coals to be sold to certain classes of consumers might be obtained in other ways. A number of districts established special prices for coals of this kind in their "price instructions and exceptions" and other explanations accompanying their price schedules. One, the Southwestern (District 15), achieved this end by assigning special quality ratings in its proposed schedules. Here, coals in three size groups (Nos. 12, 13, and 14) were graded one way for sales to industrial users and another way for sales to domestic and commercial consumers.²¹ It should be pointed out that in the Midwest the domestic consumer placed

²¹ The following extracts from the schedule of this district will illustrate the device.

| Company and Mine | Domestic and Commercial Size Group | | | Industrial Size Group | | |
|------------------------|---------------------------------------|----|----|--------------------------|----|----|
| | 12 | 13 | 14 | 12 | 13 | 14 |
| Alston | A | A | I | H | H | O |
| Binkley | D | D | U | K | K | BB |
| Crowe | D | D | P | K | K | T |
| Scott, Arthur | D | | K | | U | BB |

Thus, from the Alston mine the coal of size group 12 is A (\$1.60) when sold to domestic and commercial consumers, and H (\$1.25) when sold to industrial consumers.

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a higher value on free-burning coals than on coals that had stronger coking characteristics.

Only 4 districts failed to make any provision for the differential pricing of coal for different uses. The number of districts providing in one form or another for differential pricing as to uses and the use classes established follow:

| <i>Use Class</i> | <i>Size Classification</i> | <i>Other Ways</i> | <i>Total</i> |
|--|----------------------------|-------------------|--------------|
| Blacksmithing | 2 | 1 | 3 |
| Bunker fuel | | 3 | 3 |
| By-product coke making | 2 | | 2 |
| Domestic sizes for industrial purposes | 1 | 2 | 3 |
| Railroad locomotive fuel | 6 | 11 | 17 |
| Retort- and water-gas | 2 | | 2 |
| Special industries | 2 | | 2 |

It will be observed that, except for railroad locomotive fuel, the number of districts providing for a given use class was small, three at the most. Price differentials for locomotive fuel were supported on the ground that this fuel is sold to the consumer at the mine, at a time convenient to both, and under fairly elastic specifications as to size and quality. Special prices for this fuel were not objected to by the Consumers' Counsel Division in its Brief relating to values as to uses.

4) *Classifications and special preparations of coal other than screening.* The boards of five districts established special size groups for coals which have been washed, cleaned, or crushed. Of the remaining 17 districts some preferred to deal with specially prepared coals in their "price instructions and exceptions," others in the general instructions accompanying their price schedules, and still others in their classifications of coal by kinds and qualities.

The number of districts which set up size groups or otherwise provided for price differentials for specially prepared coal were:

| <i>Type of Preparation</i> | <i>Size Classification</i> | <i>Other Ways</i> | <i>Both Ways</i> | <i>Total</i> |
|-------------------------------------|----------------------------|-------------------|------------------|--------------|
| Chemical treatment (oil, wax, etc.) | | 22 | | 22 |
| Washing, cleaning, etc. | 1 | 7 | 3 | 11 |
| Crushing | 1 | 4 | | 5 |

It should be pointed out that no districts established special size groups for chemical treatment, that only four set up size groups for washing and cleaning, and one for crushing. Apparently spe-

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cially prepared coal could have been handled just as well in the price instructions and exceptions.

Two additional factors sometimes influenced the number of size groups chosen for the district. The Board in Panhandle West Virginia (District 6), for example, made its size classification conform with that in competing districts for the purpose of minimizing discrepancies in the coordinating stage of the pricing process. In some instances the number of size groups was influenced by a desire for clarity. Thus the Commission decided to increase the size groups of Southern Numbered 2 (District 8) from 15 to 31 "for purposes of clarification and convenience, and to more clearly and distinctly classify" the coals of this district.²²

One cannot fail to be impressed by the variation in the number of total size groups in the 22 districts. Some of the districts, notably 1 and 3, tried to hold down the number of such groups. The district board of Eastern Pennsylvania (No. 1) proposed only five such groups, stating that it "believes that the five size groups it has proposed represent a step towards simplification of its price list which is much needed; that they are all that are necessary; that by so limiting its size groups it will aid in eliminating requests for substitution of one size coal for another; and that said groups are fair and equitable as to both producers and consumers."²³ On the other hand, the Board of the Southwestern District (No. 15) adopted 21 separate size groups because a survey of distribution reports showed that "this number of different sizes was actually loaded within this district."²⁴ It is worth noting that eight districts proposed 20 or more size groups. Undoubtedly the number of groups submitted by the various boards reflected to a considerable degree the thinking and experience with size classifications under the National Recovery Administration and the first bituminous coal control act.

The Consumers' Counsel called attention to the lack of standardization throughout the producing districts. As evidence he pointed out that the 8" × 3" size "is classified as 'egg' in District 16, as 'grate' in District 17, as 'stove' in District 20, and as 'furnace' in District 22." He added that "in many instances, the proposed price schedules not only classify sizes differently for different districts, but even classify them differently within the same district, depending upon the consuming market, or the use classification, or

²² *Federal Register*, January 19, 1939, p. 325.

²³ *Ibid.*, January 19, 1939, p. 279.

²⁴ *Ibid.*, December 22, 1938, p. 3095.

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the transportation method, or the preparation given at the mine (whether raw, washed, cleaned, etc.).” He held that standardization of size groups would be in the interest of the consumer inasmuch as price schedules would be more readily understood and price comparison could be more easily made.²⁵ It was pointed out, however, that the large consumers are competent to analyze the size variations and that the small consumer did not make use of price schedules.

b. *Classification by kinds and qualities.* The first stage of the classifying procedure made available for each district the number and content of the size groups to be included in the price schedule. The next major task of the district boards was to classify the coals of each mine according to kinds and qualities so that price differentials which reflect “relative market values” might be established. If the reader will turn to the sample schedule upon which uncoordinated price schedules were to be patterned (Table 16) he will see (1) that the quality ratings or rankings of the coals of a given mine were to be made for each size group and (2) that they were to be expressed in letter grades.

Inasmuch as the provisions of the Act with regard to this procedure were expressed in general terms, and the Act and the administrative agencies failed to define “kinds and qualities,” the boards were given much leeway in carrying out this function. For these reasons and because of great differences in the composition of coals, the procedures followed in this phase of the price-fixing process varied widely from district to district.

1) *Proposed classification procedures.* A difference of opinion prevailed among the district boards about the method that should be used in grouping coals by kinds and qualities. Four types of procedures were advocated; these may be characterized as: (1) overall ranking, (2) factor ranking based on coal-to-coal comparisons, (3) factor ranking according to predetermined grades and standards, and (4) rating in terms of definite units of measurement. The proposed procedures fall into two basic categories: ranking which places coals in broad classes, groups, or zones,²⁶ and rating which ordinarily makes use of some kind of a “yardstick” utilizing definite units of measurement and expresses the results of evaluation in

²⁵ *Brief for Consumers' Counsel Division . . .*, p. 164.

²⁶ This quality ranking is, of course, wholly distinct from the geological ranking of coals into anthracite, bituminous, sub-bituminous, and lignite described earlier in this chapter.

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quantitative terms. An explanation of these methods may help in understanding more readily the problems involved and the classification procedures used by the various district boards.

a) *Over-all ranking.* Coals may be classified by comparing them with each other without detailed examination of their physical, chemical, and market characteristics. Classification under this procedure is made without formal analysis and is based on a working knowledge of the coals involved. Because coal analyses disclose essential characteristics of coal, there is little justification for using over-all ranking, especially since it places much emphasis on human judgment.

b) *Factor ranking based on coal-to-coal comparisons.* Coals may also be ranked with respect to each of certain selected characteristics, commonly referred to as "factors." Sometimes the ranking is restricted to measurable factors such as heat content, ash content, etc., but more often imponderables such as "consumer acceptance," "market history," and "characteristics of performance" are also included. Under this procedure, coals are compared with each other for each of the selected factors—one factor at a time. In this way a number of categories, one for each factor, are made available which show the position of each coal relative to that of all other coals in the district. The results of the ranking may be shown by the position assigned to the coal or by descriptive terms such as "low," "average," and "high." These categories, one for each factor, served as the basis upon which the boards or their committees formulated their quality classes or letter grades. Since no attempt was made to measure the relative importance of each of the factors, the resulting grades were largely a matter of judgment.

c) *Factor ranking according to predetermined grades and standards.* The methods of over-all and factor ranking based on coal-to-coal comparisons have been criticized because they place too much weight on opinion. To reduce the area of judgment, certain critics have advocated that coals be ranked according to grades and standards which have previously been established for each of the characteristics of coal. Such a procedure would make available a number of coal categories, one for heat content, another for ash content, a third for sulphur, etc. Those who suggest this approach generally recommend the use of the standard specifications of coal by grade and rank which were prepared by the American Society for Testing Materials. The society has prepared grade specifications for:

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The size of coal

The calorific value of the coal (as delivered) in Btu expressed to the nearest hundred

The amount of ash

The temperature at which ash softens

The amount of sulphur

The specifications for ash, ash-softening temperature, and sulphur are:²⁷

| Amount of Ash | | Ash-Softening Temperature | | Sulphur | |
|---------------|-----------------|---------------------------|-----------------|---------|----------------|
| Symbol | Per Cent | Symbol | Degrees F | Symbol | Per Cent |
| A 4 | 0.0 to 4.0 | F 28 | 2800 and higher | S 0.7 | 0.0 to 0.7 |
| A 6 | 4.1 to 6.0 | F 26 | 2600 to 2790 | S 1.0 | 0.8 to 1.0 |
| A 8 | 6.1 to 8.0 | F 24 | 2400 to 2590 | S 1.3 | 1.1 to 1.3 |
| A 10 | 8.1 to 10.0 | F 22 | 2200 to 2390 | S 1.6 | 1.4 to 1.6 |
| A 12 | 10.1 to 12.0 | F 20 | 2000 to 2190 | S 2.0 | 1.7 to 2.0 |
| A 14 | 12.1 to 14.0 | F 20— | Less than 2000 | S 3.0 | 2.1 to 3.0 |
| A 16 | 14.1 to 16.0 | | | S 5.0 | 3.1 to 5.0 |
| A 18 | 16.1 to 18.0 | | | S 5.0+ | 5.1 and higher |
| A 20 | 18.1 to 20.0 | | | | |
| A 20+ | 20.1 and higher | | | | |

The grade designation for a hypothetical coal might read:

2-4", 132 — A8 — F24 — S 1.6

These symbols designate a coal of 2 to 4 inches in size, having a heat content of about 13200 Btu, an ash content falling between 6.1 and 8.0 per cent inclusive, an ash softening temperature falling between 2400° F. and 2590° F. inclusive and a sulphur content falling between 1.4 and 1.6 per cent inclusive.

At the hearings on the classification of coal and standard methods and rules of making and applying such classifications, the Consumers' Counsel recommended such a procedure, not as a standard of classification for price fixing, but "for the purpose of protecting both producers and consumers by assuring the utilization of a uniform and standard description of coal in the valuation of coals (and, at some future date, in standards for the classification of coals)."²⁸

The Counsel recommended that the Commission adopt the various standard specifications for classification of coal which have been developed by the American Society for Testing Materials and require that the coal of each mine of each code member be described (1) by rank and its position in the scale of rank, (2) by

²⁷ 1937 Supplement to American Society for Testing Materials Standards, pp. 151-52.

²⁸ How Much Heat in Bituminous Coal, Consumer Ideas No. 1, Consumers' Counsel of the National Bituminous Coal Commission, 1937, p. 24.

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grade (that is, calorific value, ash content, etc.) in the case of the basic sizes, (3) by tolerance and size consist,²⁹ and (4) by sizes.³⁰

The advocates of this method undoubtedly realize that the development of a series of categories, one for each of the various measurable characteristics, would still leave a considerable area for judgment in fixing prices. The method does not provide a procedure for arriving at the importance of (1) each of the characteristics

²⁹ The term "size consist" has been widely used in the bituminous coal industry but has never been authoritatively defined. Size consist is sometimes thought of as reflecting the degree of resistance to breakage of a mass of coal under the influences of mining, handling, and atmospheric conditions. It can be measured by passing the coal through several screens whose openings are of different sizes, and weighing the quantities of coal that remain above and fall through the screens. Some coals exhibit a preponderance of small particles, others have a more even distribution of large, medium, and small particles.

Usage differs with respect to the place where size consist is to be measured or estimated. Some persons limit it to the condition of coal at the mine after the mining and preparation procedures have been completed. Others apply it to the condition of coal at its destination, in the possession of the dealer or the consumer.

Howard N. Eavenson, who had had a wide experience with the classification of coals under the Coal Act of 1937, pointed out to the authors that "size consist was not a principal factor in the determination of minimum prices as set on various coals, but it was a factor in setting up the definitions of size groups for the various producing districts by the Bituminous Coal Commission. . . . Size consist comes into play as between two different coals in determining their value when the coal is used in specific plants. Generally it does not carry much weight in the determination of the relative values of different coals, except at plants where coarseness of the nut-and-slack size, for instance, of one kind of coal would increase its value to that plant, as against another kind which would not have this characteristic." (Letter dated July 18, 1947.)

³⁰ The Counsel also recommended that the Commission adopt the standard definitions of terms relating to coal insofar as they were applicable under the Act, and that the descriptive nomenclature to be approved by the Commission should disclose by whom the sample submitted for analysis was taken, the name and address of the laboratory in which the analyses were made, and the date when the sample on which the rank and grade descriptions were based was taken. He suggested that descriptive grade and rank specifications, in accordance with the methods and terms he proposed, should be required by and filed with the Commission. Finally he recommended that the Commission consider the following proposals either at the hearing on standards of classification or the hearing on marketing rules and regulations: (1) that individual operators upon request be required to furnish a prospective consumer with the rank and grade specifications proposed above; (2) that consumers be permitted to check the specifications given them by sellers to those submitted to the Commission and that the Commission provide facilities for this purpose and inform consumers of any variances; and (3) that in the event such variances are pronounced, the producer be made subject to action by the Commission for violation of those provisions of the Act having to do with unfair methods of competition and discriminatory trade practices.

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analyzed or (2) the degrees established to indicate the position of the coal in any single category.³¹

Those who are critical of the method point out that these specifications for classification have been developed from a standpoint of efficient consumption and not from the point of view of price determination. They argue that the classifications are admittedly incomplete, since they fail to consider factors such as caking and friability that determine the behavior of coal in the fire-box and its value on the market. While the procedure is of practical value in describing coals in terms of the factors included in the classification, and might well have been utilized by the Commission in formulating its standards and definitions of the qualities of coal, it is not inclusive enough to be used as the basis for evaluating coals.³² For purposes of price fixing, the classification of "kinds and qualities" must of necessity take into account both the properties of coal not considered in the A.S.T.M. classification and the criteria laid down in the Act, especially factors that affect "relative market values," existing fair competitive opportunities, and competitive relationships between coal and other forms of fuel and energy.

Notwithstanding its limitations, the use of the method of ranking coals according to predetermined grades and standards as one step in the appraisal procedure would have served useful purposes. It would have required those assigned the task of price fixing to give more careful consideration to important intrinsic properties of coal and would have made available to the Coal Division data of immeasurable value in coordinating the proposed minimum prices. There is reason to believe, however, that the collection of these data would have extended considerably the time needed to arrive at proposed minimum prices.

³¹ "One of the great troubles with classifying coal by analyses," wrote Mr. Eavenson, "was the fact that the analyses that were submitted were not on a uniform basis, and all of them were not reliable, and, in fact, many of the companies submitted analyses that were clearly wrong. [If adequate analyses had been submitted] it is very likely that there would have been a greater use of the classification of the American Society for Testing Materials and certainly it could have been used to a very considerable extent, as far as the chemical and other qualities went without requiring the use of so much judgment." (Letter dated June 12, 1944.) This condition was corrected in the coordination phase of price fixing. The district boards had adequate analyses made of the coals of all mines by an independent agency.

³² See statements of A. C. Fieldner, United States Bureau of Mines, and Henry T. Coates, National Association of Purchasing Agents, at a hearing held July 15 and 16, 1937, pursuant to Order 8 of the Commission which directed all district boards to propose standards of classification. (*How Much Heat . . .*, Consumers' Counsel, pp. 5-22.)

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d) *Rating in terms of definite units of measurement.* Plans of this type attempt to develop a procedure for (1) rating coals serving a common market by assigning weights to the variations in selected characteristics of coal, and (2) determining relative prices.

The outstanding example of this approach is the technique proposed by the Technical Board of the NRA Code Authorities for Western Pennsylvania, Northern West Virginia, and the Eastern Subdivision (including Eastern Pennsylvania, Maryland, and three counties in West Virginia).³³ The plan was not formulated in time to be utilized under the NRA, and failed to win the approval of producers in subsequent price-fixing programs. The Board was asked to devise a method for the classification and correlation of coals as a basis for the establishment of minimum fair prices as provided for under the Bituminous Coal Code. It conceived its task to be to ascertain "what relative value the average consumer *should* be willing to assign to coals of varying properties, in terms of the relative cost to him in obtaining an equivalent utilization value therefrom."³⁴ Thus the Board was not concerned with the establishment of actual minimum prices but with the development of a procedure for determining relative values, that is, the prices at which various coals in a given market would have to sell at the consumer's plant in order to be on an equal competitive basis with each other. The procedure was to be such that once a price-fixing agency fixed the actual price of any given coal for a given market, the formula would give the actual prices of all other coals selling in that market. It was the Board's contention that the dollar value of any particular grade and size of coal should be a function of the cost of production, the cost of transportation, the relative utilization costs of other competing fuels, and similar factors, and that the relative values should reflect only the value of the various coals

³³ In preparing this section the authors have drawn on the following publications of Stephen P. Burke: "Price-Fixing' in the Bituminous Coal Industry—A Legal-Economic Problem," (originally published in *West Virginia Law Quarterly*, April 1935, pp. 225-248) which was published with "A Résumé of the Report of the Technical Board on the Value Correlations of Coals" under the title of *The Problem of "Minimum Fair Competitive Prices" in the Bituminous Coal Industry* by the Northern West Virginia Subdivisional Code Authority, Fairmont, West Virginia, April 24, 1935 and "*Minimum Prices fo.b. Mines*" under the *Bituminous Coal Conservation Act of 1935*, a report prepared at the request of the District Board of District No. 3 of Minimum Price Area 1, Morgantown, West Virginia, November 1935.

³⁴ Burke, *The Problem of "Minimum Fair Competitive Prices" in the Bituminous Coal Industry*, p. 31.

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to the average consumer. All coals of approximately the same quality, therefore, were to sell at the same price in any given market. Companies which, because of unfavorable freight rates or high mine costs, could not meet the price established for a given grade and size of coal would be compelled to withdraw from the market since the NRA Code prohibited sales below mine cost.

Although it was aware that the importance of the physical and chemical properties of coal often varies with the intended use, the Board, to simplify its problem, decided to limit its consideration to one type of burning equipment. Because the predominant use of bituminous coal has been for the production of steam and because adequate data for all steam-raising plants were not available, the type of consumer selected was a public utility which operated a moderately large stoker-fired power plant for steam-raising purposes.

The first step taken by the Board to rate the various coals serving a common market was the selection of six physical and chemical properties commonly included in a coal analysis. These were:

| Group A: Relative Factors | Group B: Fixed Factors |
|---------------------------|---------------------------|
| Heat content | Ash-handling cost |
| Moisture (as sold basis) | Sulphur (as sold basis) |
| Ash (as sold basis) | Ash-softening temperature |

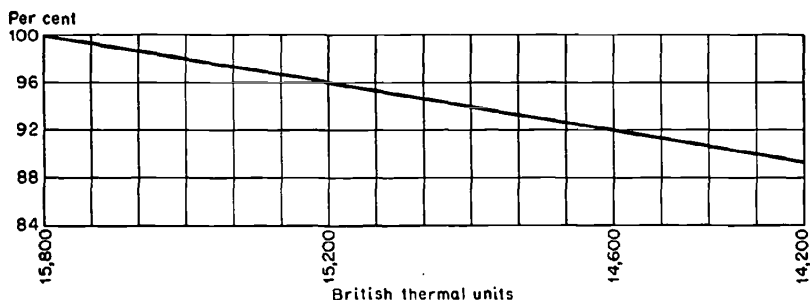
The Board was aware that other properties and factors also influence the marketability or value of coal to the consumer. It found it necessary, however, to disregard them, since no precise or acceptable methods for evaluating them were available.

The second step was to create a separate yardstick for each factor. Two general methods were developed, one for the "relative factors" (Group A) and another for the "fixed factors" (Group B). In the case of the relative factors, the Board expressed the importance of a given factor in each of the coals serving a common market as a percentage of a base coal, that is, a competing coal in the same market which possessed this particular factor to the most desirable degree. In other words, the base coal was given a value of 100, and other coals in the market were related to it as percentages. The base coal need not, and commonly would not, be the same coal for each of the three related factors. A more detailed description of the method used to determine the importance of each relative factor follows:

The heat content was provided for by choosing as the base coal

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one containing 15,800 British thermal units.⁸⁵ Coals having a lower heat content were related to the base coal in the manner indicated in the diagram:



Thus a coal having 15,200 Btu would be rated 96 and one having 14,600 Btu would be rated 92. This is at the rate of 4 points for every 600 Btu.

Similarly the Board drew a graph for moisture content on an as-sold basis. A coal having a moisture content of not more than 3 per cent was rated 100. Wetter coals were assigned lower values, approximately one point for every 1 per cent of moisture. To illustrate:

| <i>Per Cent of Moisture</i> | <i>Rating</i> |
|---------------------------------|---------------|
| 2 | 100 |
| 3 | 100 |
| 5 | 98 |
| 7 | 96 |

The measurement of ash content was determined by taking as a base coal one having an ash content not exceeding 5 per cent. Coals having more than 5 per cent ash were assigned lower values at the rate of 10 points for every 7 per cent of ash. Thus a coal of 12 per cent ash was assigned a value of 90.

The fixed factors, Group B, were computed in cents per ton and deducted from the base value of each coal, that is, the computed market price before the fixed factor deductions are made. The yardsticks used to evaluate coals for these three factors were constructed on the basis of the data presented in the first table on page 146.

Table 19 has been prepared to facilitate the understanding of the method used to determine relative prices in this procedure. Sec-

⁸⁵ As measured under laboratory conditions. Heat yield in an average stoker-fired power plant would be somewhat lower, but this fact was taken into consideration by the Technical Board.

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| <i>Factor</i> | <i>Allowance = 0</i> | <i>Allowances</i> |
|---------------------------|---|--|
| Ash-handling cost | Up to and including 5 per cent of ash content | At the rate of \$.01 per ton for each 1 per cent of ash content above 5 per cent. |
| Sulphur (as sold basis) | Up to and including 1.6 per cent of sulphur content | At the rate of \$.01 per ton for each 0.3 per cent of sulphur above 1.6 per cent up to 4 per cent beyond which no additional allowances are made. |
| Ash-softening temperature | 2800° F and temperatures above | \$.02 for each 100° F between 2800° and 2600° F; \$.032 for each 100° F between 2600° and 2000° F, and \$.23 irrespective of temperatures below 2000° F. |

tion A gives analyses of four hypothetical coals, B the ratings for the relative factors, C the deductions or allowances to be made for the fixed factors, and D the relative values.

TABLE 19

Hypothetical Data Used to Explain Procedure Proposed under NRA by Technical Board of Code Authorities for Western Pennsylvania, Northern West Virginia, and Eastern Subdivision

| <i>Factors and Values</i> | <i>Coal I</i> | <i>Coal II</i> | <i>Coal III</i> | <i>Coal IV</i> |
|--|---------------|----------------|-----------------|----------------|
| A. Analyses of Hypothetical Coals (Relative and Fixed Factors) | | | | |
| 1 Heat content (H. Value) (degrees F) | 15345 | 15125 | 15367 | 15134 |
| 2 Moisture content (per cent) | 2.5 | 3.5 | 1.6 | 2.0 |
| 3 Ash content (per cent) | 8.0 | 8.5 | 8.6 | 12.1 |
| 4 Ash-handling cost | | | | |
| 5 Sulphur content (per cent) | 1.05 | 2.5 | 1.1 | 2.3 |
| 6 Ash-softening temperature (degrees F) | 2620 | 2075 | 2795 | 2585 |
| B. Relative Factors (per cent) | | | | |
| 1 Heat content | 97 | 96 | 97 | 96 |
| 2 Moisture content | 100 | 99.5 | 100 | 100 |
| 3 Ash content | 96 | 95 | 95 | 90 |
| All relative factors (1 × 2 × 3) | 93.1 | 90.7 | 92.2 | 86.4 |
| C. Fixed Factors (dollars) | | | | |
| 4 Ash-handling cost | .03 | .04 | .04 | .07 |
| 5 Sulphur content | .00 | .03 | .00 | .03 |
| 6 Ash-softening temperature | .04 | .21 | .00 | .04 |
| Total deductions (4 + 5 + 6) | .07 | .28 | .04 | .14 |
| D. Relative Values (dollars) | | | | |
| Base value | 2.27 | 2.21 | 2.25 | 2.11 |
| Fixed-factor deductions | .07 | .28 | .04 | .14 |
| Relative values | 2.20 | 1.93 | 2.21 | 1.97 |
| Assumed freight | 1.00 | .75 | .50 | .25 |
| Relative mine prices | 1.20 | 1.18 | 1.71 | 1.72 |

Source: Rearranged from data published in Stephen P. Burke, *The Problem of "Minimum Fair Competitive Prices" in the Bituminous Coal Industry*, Northern West Virginia Subdivisional Code Authority, Fairmont, West Virginia, 1935.

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Once the actual price of any coal for a particular market has been established by the price-fixing agency, the price of any other coal may be obtained as follows:

First, compute an over-all relative factor for each of the coals by multiplying the percentage assigned for heat content by that assigned for moisture and then multiplying the product by the percentage allowed for ash (see B). Second, compute the base value of the coal for which a market price has been established—assuming this coal to be III and the price \$2.21—by adding to it the total deductions (four cents) to be allowed under “fixed factors” (see C). Third, determine the “base value” of each of the remaining coals by using the formula $r(s/t)$ in which r equals the “base value” of the coal for which a market value has been established, s , the “over-all relative factor” for the coal whose “base value” is to be determined, and t , the “over-all relative factor” for the coal with an established price. Fourth, deduct for each coal the cents per ton allowed for the three fixed factors from their respective “base values.” This will give the “relative values” of the several coals which, as previously explained, are the prices at which they should sell at the consumer’s plant if the coals involved are to be kept on an equal competitive basis. The mine price of the coal of any operator for shipment to a given market may be obtained by deducting, in each case, the freight rate from the computed “relative value” of his coal in that market.

The approach of the Technical Board to the problem of classifying coals has been criticized for relying upon too many untested assumptions. Critics pointed out that the Board’s concept of an average consumer was unrealistic and that the choice of the six factors used in the evaluation process was arbitrary—other factors being completely ignored. They argued that the charts underlying the valuation of the “relative factors” had not been substantiated, and questioned the representativeness of the data supplied by engineers for computing the “fixed-factor” deductions.

Howard N. Eavenson, who was one of the engineers employed by the Board of District 2 to submit data to the Technical Board, advised the authors that “under the conditions named the value of coal for steam purposes depended very directly on the heat content, with which everyone was in accord. We were also able to present a number of cost data showing the effect on the value of coal of various percentages of moisture and also of ash, and there was practically unanimous agreement among the Board and the engineers furnishing data to it regarding these factors. When it came

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to the questions of sulphur and ash softening temperature, there were very few known data and none were submitted by the engineers, and what figures were used by the Board were never shown to anyone else, with possibly one exception. None of the technical men appearing before the Commission agreed with the use of sulphur, as while there is some difference in the value of sulphur for metallurgical coals, for steam use the effect of sulphur is generally not very important, excepting as affecting the heat value and possibly some repair costs, and there were no figures available showing what these would be. The same thing is true with the ash softening temperature only to a much greater degree, and none of the technical men were in accord with the figures used in the report of the Board. As a matter of fact, it can be burned just as efficiently as high fusion coal can be, and therefore the variation in cost decided upon could not and should not apply, and it was the universal opinion of the technical men connected with this proceeding that there were not sufficient data for either sulphur or ash fusion temperature values."

The fact that the Board failed to consider size consist and the strong coking characteristics of the Central Pennsylvania coals contributed to the defeat of the Board's program.

Lastly, the critics maintained that the use of the Technical Board's formula would have disrupted the then-existing relative price structure as well as fair competitive opportunities—requirements which the final minimum prices had to observe under the terms of the Act. To illustrate: the formula gave extremely low prices on low-grade coals to permit their movement into markets that have high freight rates, and this was contrary to all past records of coal movement. As a result, this particular plan of classification, while generally known to operators, did not influence NRA prices, and affected only indirectly the price-fixing procedure under the Coal Act of 1937.

2) *Quality classification in practice.* The preceding analysis should serve to throw some light upon the problems of classification which were to confront the 22 district boards under the Act of 1937. We are now ready to take up first, the factors used, and second, the procedures followed by the district boards.

a) *Factors considered by boards.* The significant provisions of the Act pertaining to minimum prices and coal classification other than by sizes, and the corresponding factors used by the 22 boards in ranking their coals are presented in Table 20. Inasmuch as some of the factors are technical in nature and others, not having been

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TABLE 20

Provisions of Bituminous Coal Act of 1937 Pertaining to Minimum Prices and Coal Classification, and Factors Other than Size Used by Producing District Boards in Ranking Their Coals

| <i>Provisions of the Act^a</i> | <i>Factors Other than Size Considered by the Boards</i> |
|--|--|
| “Each district board shall . . . propose minimum prices . . . for kinds, qualities, and sizes of coal produced in said district, and classification of coal and price variations as to mines, consuming market areas, . . .” | “Qualities” Analysis Physical characteristics Characteristics of performance Special treatment of coal |
| “. . . values as to uses and seasonal demand.” | Values as to uses Seasonal demand |
| “The minimum prices so proposed shall reflect, as nearly as possible, the relative market value of the various kinds, qualities, and sizes of coal; shall be just and equitable as between producers within the district; and shall have due regard to the interests of the consuming public.” | Consumers’ acceptance Marketability Market history |
| (No provision was made in the Act for consideration of this factor at this stage of the price-fixing process.) | Competitive fuels and energy |

^a 50 U.S. Stat. at L. (1937), 72.

defined, are vague and overlapping, the following explanations may be useful:

Qualities. The term should not be confused with the phrase “kinds and qualities” stated in the Act. Only five district boards listed this factor and none of them attempted to define it. It probably is meant to include the chemical and physical characteristics of coal that affect its value and that have not been separately listed by the Board.

Analysis. Analysis measures such characteristics of coal as Btu (heat content), moisture, volatile matter, fixed carbon, sulphur, ash, and ash-softening temperature.⁸⁰

Physical Characteristics. The term refers to such characteristics as appearance, structure, friability, and size consist.

Characteristics of Performance. This factor has to do with the coking, caking, or free-burning qualities of a coal and with the nature of its ash.

⁸⁰ “Analysis” as used above differs from “proximate analysis” (including moisture, volatile matter, fixed carbon, and ash) in that Btu, sulphur, and ash-softening temperature have been added. (*International Library of Technology* [1922], Vol. 87B, Sec. 38, pp. 79-80.)

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Special Treatment of Coal. This factor refers to coal whose commercial value has been enhanced by washing, cleaning, waxing, or chemical treatment.

Consumers' Acceptance. This term reflects the willingness of consumers to buy a given quantity of a certain grade and size of coal at a particular price. In other words, it is the effective demand for coal of a particular grade within a particular size group. This demand, while largely determined by the specific factors listed by the several boards may also be affected by imponderables.

Marketability. Although a number of districts listed both this and consumers' acceptance as factors considered in classifying their coals, it is difficult to find any basis for a distinction between them.

Market History or Market Experience. This term appears to differ from consumers' acceptance and marketability in two respects: it suggests (1) that a period of several years was taken within which relative market values were examined, and (2) that some reference was made to records of the tonnages and the prices at which particular coals sold during the period. In most districts, however, such facts were not compiled and the boards relied upon group judgment based on selling experience.

Values as to Uses. In most districts this phrase was apparently taken to mean that a particular coal was assigned one price when bought by one class of consumers and a different price when purchased by another class of consumers. The most important use classifications are railroad fuel, by-product coal, bunker fuel, coal for making retort- and water-gas, and, in effect, domestic coal, since coals for domestic use in some districts carry a higher price than similar coals for industrial uses.

Seasonal Demand. This factor refers to the fluctuating pattern of consumption and the practice in certain areas of granting discounts to domestic and industrial consumers for off-season purchases.

Competitive Fuels and Energy. In regions where fuel oil, natural gas, or hydroelectric power was plentiful the prices assigned to coal had to be low enough to permit it to compete as effectively as it did prior to the determination of prices. The Act stated that this factor should be taken into consideration but specified that it should be taken into account in the coordination stage. Some of the districts gave weight to competition with other fuels in the

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initial price-fixing procedure. Where this was done the Commission took a tolerant attitude, apparently believing that no good purpose would be attained by ruling out this factor at this stage of the price-fixing procedure and insisting upon its consideration in the coordinating phase of the process.

To what extent were these eleven factors considered by the various district boards in establishing their respective quality classifications? Table 21 gives for each district the factors which its board stated were used in classifying its coal and determining its uncoordinated prices. It is important to note that this table merely lists the factors considered and fails to indicate the importance attached to each of them. It shows, for example, that District 1 used seven factors but does not disclose how much more weight was given to coal analyses than to the physical characteristics of the coal or any of the other five factors. Again, it reveals that coal analyses were used in 13 districts, but it fails to show anything about the character of the analyses used. Lastly, it is not certain that all factors were reported. It is quite possible that certain districts specified only those factors which were given serious attention while other districts listed all factors including those given very casual consideration. In fact, a study of the evidence does not reveal, except in a few cases, the degree of consideration given to any of these factors. For the most part the evidence consists solely of statements of witnesses from the various districts that such factors were taken into account.

Of the 22 districts, three did not report quality classifications because their coal showed little or no variation.

Of the 19 districts reporting quality classifications, 13 made use of coal analysis. In nearly all of these 13 districts, analysis was the most important single factor in evaluating coal. Within any one district, however, coal analysis was seldom given the same weight for all sizes. For example, industrial consumers normally attach much more importance to analytical value than do householders. As a result, the district boards found it necessary to give much more consideration to coal analysis in evaluating the mine-run and slack sizes than they did in the appraisal of their domestic sizes. In Arizona (District 18) the free-burning, lower heating value coals were rated much higher by the consumer than were the higher heating value coking coals. This was because of the ease in tending the furnace and not because of the heat.

The physical characteristics of the coal were mentioned by 15 and the characteristics of performance by 11 districts. An analysis

TABLE 21
 Factors Used by Producing District Boards to Classify Their Coals
 and to Determine Uncoordinated Minimum Prices

| Factor Considered | Producing District | | | | | | | | | | | | | | | | | | | | | | |
|------------------------------------|--------------------|---|---|---|----------------|----------------|----------------|---|---|----|----|-----------------|----|----|----|----|----|----|----|----|----|----|--|
| | 1 | 2 | 3 | 4 | 5 ^a | 6 ^a | 7 | 8 | 9 | 10 | 11 | 12 ^a | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 22 | 23 | |
| Coal analysis | X | X | X | X | | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | |
| Physical characteristics | X | X | X | X | | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | |
| Characteristics of performance | X | X | X | X | | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | |
| Special treatment of coal | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | |
| Consumers' acceptance | X | | X | X | | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | |
| Marketability | | X | X | X | | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | |
| Market history | X | | X | | | X | X | X | | X | X | X | X | X | X | X | X | X | X | X | X | X | |
| Values as to uses | X | X | X | X | X | X | X ^b | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | |
| Seasonal demand | | | | | | | X ^b | X | | | | | | | | | | | | | | | |
| Quality or qualities | | | X | X | | | | | | | | | | | | | | | | | | | |
| Competitive fuels and energy | | | | | | | | | | | | | | X | X | X | X | X | X | X | X | X | |
| Total number of factors considered | 7 | 6 | 9 | 8 | 2 | 2 | 9 | 8 | 6 | 4 | 8 | 2 | 9 | 6 | 8 | 9 | 6 | 6 | 4 | 6 | 4 | 5 | |

x Indicates use of factor.

^a In this district a single quality class was established and thus, properly speaking, there was no need to use factors for ranking or rating coals. This factor was considered but no special price variations were proposed for it.

^b This factor was considered by the authors from the *Federal Register*, December 14, 1938-February 28, 1939.

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of the testimony of the first eight districts before the hearings on classification and price-fixing procedures leads us to conclude that where both factors were used they were regarded as of equal importance and singly or together were ranked as second in importance to coal analysis. Market considerations in one form or another were considered in 19 of the reporting districts and undoubtedly were given substantial weight. Three western districts—Arkansas-Oklahoma (District 14), Southwestern (District 15), and Washington (District 23)—took into account the competitive fuel situation in evaluating their respective coals. Five districts gave consideration to the factor listed as “quality” or “qualities.”

The three remaining factors—special treatment of coal, values as to uses, and seasonal demand—were of little or no importance in determining general price relationships within a district, but were used primarily to establish special price differentials. Thus all 22 districts established higher prices for coal which underwent some form of cleaning or special treatment (chemical, oil, or wax). Eighteen districts granted discounts to one or more classes of consumers for coal purchased for designated uses, and two southern districts (8 and 13) provided for special seasonal discounts during the spring and summer.

b) *Classification procedures used by boards.* Many operators and especially sales executives insisted that it is impossible for practical purposes to establish prices for various coals by applying uniform “yardsticks” of value to the many intrinsic qualities and market characteristics of coal. They pointed out that certain of these attributes, such as “market history,” “consumer acceptance,” and “characteristics of plant performance,” cannot be assessed. They argued that the significance of most factors in a coal analysis as well as the importance and accuracy of sizing vary with the use which is to be made of the coal, and, therefore, that the suitability of a coal for a given plant should be regarded as an individual matter. For these reasons and because the final price structure had to preserve the existing relative price relationships, they took the position that there should be “no classification of the kinds and qualities of coal except and apart from the price schedules,”⁸⁷ and that any pricing procedure must, in a large measure, reflect the judgment of those who had a long experience in the industry and

⁸⁷ Memorandum of the coal operators’ lawyers committee of March 1938. Quoted by Quirk, *op.cit.*, p. 97.

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an intimate knowledge of the coals produced and of the price relationships prevailing in the district.

In the light of the operators' claims, a classification of procedures used in the appraisal of coals becomes of especial interest. Unfortunately, the statements explaining the procedures followed in appraising coals as reported to the Commission by the various district boards are not complete. Notwithstanding this limitation and the fact that classification always tends to be somewhat arbitrary, an attempt to classify the methods utilized by the district boards may be useful. Of the 19 districts³⁸ which established quality classifications only one, Illinois (District 10), adopted a rating procedure. The remaining districts used factor ranking based on coal-to-coal comparison.³⁹ It should be stated, however, that some of these districts, especially 19, 22, and 23, were so casual in their treatment of individual factors that the writers considered placing them under the over-all ranking method. No district ranked its coals according to predetermined grades and standards.⁴⁰

It is impossible in the scope of a single volume to treat fully the methods used in all districts. To give the reader an understanding of what is involved in classifying coals according to kinds and quality, the procedures used in Eastern Pennsylvania (District 1) and Illinois (District 10) are summarized. Eastern Pennsylvania⁴¹ was selected because it illustrates in a general way the approach, but not the specific technique, which was followed by the districts using the factor-ranking method, and Illinois because it is the only attempt by a district board to rate coals in terms of definite units of measurement. The most detailed description of the factors considered in proposing quality classes is found in Indiana (District 11), but because space was limited and the statement of Indiana's procedure was incomplete, it was not selected to illustrate the factor-ranking procedure.

When the 17-man board of Eastern Pennsylvania took on the

³⁸ It will be recalled that three districts (5, 6, and 12) did not submit quality classifications because there was practically no intra-district variation in the quality of their coal.

³⁹ In certain districts a number of the factors included in coal analysis were subjected to measurement. Since measurement was not consistently applied and the resulting rank assigned to the coal was not expressed in quantitative terms, these districts were listed as having used factor ranking based on coal-to-coal comparisons.

⁴⁰ For a discussion of types of classification procedures, see section D a), b), c) of this chapter.

⁴¹ Although District 1 also includes the coal mines of Maryland and of Grant, Mineral, and Tucker counties of West Virginia, it is general practice to refer to it as "Eastern Pennsylvania."

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task of establishing uncoordinated prices, there were 1,868 companies or persons operating 2,080 mines. About half of these mines were wagon mines. In 1937 the production of the district was almost 40 million tons. Of this amount approximately 93 per cent was produced by all-rail mines.

The Board assigned the initial job of classifying the coals of this district to a technical advisory committee consisting of two members who had a wide range of experience in sampling and analyzing coals. This two-man committee, working closely with a committee of nine district board members, had access to the NRA classification of coals which was based on the judgment of some 20 marketing men, and the data bearing on classification compiled since the passage of the 1935 Act. These data included analyses of coal seams in production and of the coals of 641 shipping mines. From the operators the Board obtained and made available to the committee distribution data showing by tons the various sizes of coal produced by each operator during the calendar year 1937.

The Board set up five size groups which may be summarized as follows:⁴²

| <i>Size Group Number</i> | <i>Brief Description of Content</i> |
|----------------------------------|--|
| 1 | Lump and double screened coal with top size over 2" |
| 2 | Double screened coal with top size 2" and under |
| 3 | Mine-run, modified mine-run, and minus resultant with top size over 2" |
| 4 | Minus resultant with top size over ¾" and not over 2" |
| 5 | Minus resultant with top size not over ¾" |

In Eastern Pennsylvania, as in other districts, whenever two or more specific sizes fell within one size group they carried the same letter and price for any single grade of coal.

The technical committee, as did most other boards, selected one size—to be referred to hereafter as the basic size—for primary analysis. Mine-run coal, the important size in group 3, was chosen because it supplied a large part of the district's tonnage. A study of geological and other data disclosed that the mines in this district logically fell into 45 subdistricts. The technical committee, therefore, established 45 subdistricts and began its task of classifying the various coals on the theory that all coal in the ground in the same seam and subdistrict should have the same inherent quality unless

⁴² *Federal Register*, January 19, 1939, p. 287.

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it was shown that abnormal conditions, such as faults or other geological disturbances, had brought about important changes. Other factors, however, were considered which materially modified the initial classification by mines and seams. First, the tentative classification was examined and modified in the light of analyses of the mine-run coals of rail mines grouped as to price classes, seams, and subdistrict. Also the method of mining used was taken into account. Later the technical committee, believing that "market experience must be relied upon in the last instance to arrive at price variations as between coals that would be just and equitable to producers and have due regard for the interest of the consuming public," compared the coals classified in one area with coals in other areas "on the basis of the knowledge gained . . . through past experience, through a study of the various reports on the coals of Pennsylvania, through conversations . . . with men of experience in the marketing of coals, and on the general reputation of different coals."⁴³ These coal-to-coal comparisons by subdistricts led to further changes in the tentative classification.

The proposed price schedule classified the mine-run coals of this district into eight quality classes or grades, A to H.⁴⁴ The percentage distribution of the 1,374 mines producing the mine-run size is shown below:

| <i>Per Cent of Mines Assigned a Grade of</i> | | | | | | | | |
|--|-----|-----|------|------|------|-----|------|-------------------|
| A | B | C | D | E | F | G | H | <i>All Grades</i> |
| 2.7 | 4.2 | 6.8 | 10.3 | 25.8 | 25.8 | 9.5 | 14.9 | 100.0 |

The better coals, grades A, B, and C, were concentrated in fewer than 14 per cent of all mines. Grades E and F were applied to about 52 per cent. Table 22 shows the quality grades appearing in the various coal seams. Apparently the seam was not a major consideration as a determinant of quality. The coals in many of the seam designations show a considerable number of quality grades. Even a single seam such as Brookville discloses a lack of concentration of mines. On the other hand, combinations of seams such as Sewickley, Mahoning, and Mercer, show, not a variety of grades, but a surprising concentration. Walter A. Jones, Secretary-Treasurer of District Board No. 1 stated in a letter to the authors that the variations in quality within a given seam in this producing area may be explained in large part by the long distances covered

⁴³ *Ibid.*, January 19, 1939, p. 280.

⁴⁴ The same eight quality classes also applied to size groups 1 and 2. Two additional classes, H-1 and H-2, were added later for size groups 4 and 5. See Table 27 for a cross section of grades for selected mines.

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TABLE 22

Number of Mines in Eastern Pennsylvania, by Quality Letter and by Seam, 1939
(For Size Group 3, Run-of-Mine)

| Seam | Quality Letter | | | | | | | | Total |
|-----------------------------------|----------------|----|----|-----|-----|-----|-----|-----|-------|
| | A | B | C | D | E | F | G | H | |
| A Brookville | | | 2 | 10 | | 13 | 3 | 25 | 53 |
| A' Clarion ^a | | 7 | 4 | | | 2 | 32 | 17 | 62 |
| B Kittanning, lower ^b | 36 | 36 | 74 | 51 | 55 | 48 | 41 | 52 | 393 |
| C Kittanning, middle ^c | | | 1 | | 22 | 28 | 1 | | 52 |
| C' Kittanning, upper ^d | | | 5 | 9 | 86 | 24 | 4 | 7 | 135 |
| D Freeport, lower | | 10 | 6 | 10 | 105 | 78 | 5 | 7 | 221 |
| E Freeport, upper ^e | | | | 14 | 45 | 133 | 34 | 29 | 255 |
| Pittsburgh ^f | | | | 43 | 14 | 18 | 9 | 1 | 85 |
| Bakerstown | | | | 1 | | | | 54 | 55 |
| Sewickley ^g | | | | | 16 | | | | 16 |
| Redstone | | | | | | | | 6 | 6 |
| Mahoning ^h | | 4 | | | | | | 2 | 6 |
| Mercer ⁱ | | | | | 3 | 1 | | | 4 |
| Miscellaneous seams | 1 | | 2 | 4 | 8 | 10 | 2 | 4 | 31 |
| Total | 37 | 57 | 94 | 142 | 354 | 355 | 131 | 204 | 1,374 |

^a Includes Fulton.

^b Includes Barnett and Bloss.

^c Includes Bluebaugh.

^d Includes Seymour.

^e Includes Kelly.

^f Includes Big Vein.

^g Includes Tyson.

^h Includes Six Foot and Speer.

ⁱ Includes Alton.

Source: Compiled by the authors from a list of mines in the *Federal Register*, January 19, 1939, pp. 287-98.

by the seams and by the fact that most of them had been subjected to geological disturbances in pre-historic times. He pointed out that in a single seam, the Lower Kittanning B, the following wide ranges are found:

| | Range |
|---------------------------|---|
| Volatile matter | 15 per cent to 40 per cent |
| Ash | 5 per cent to 15 per cent |
| Sulphur | 0.6 per cent to 4 per cent |
| Ash-softening temperature | 2100° F. to 3000° F. |
| Friability | The most friable in District No. 1 to the least friable in District No. 1 |

Table 23 gives the quality grades appearing in each subdistrict. Here again we find a considerable number of quality classes:

| Quality Grades | Subdistricts | Mines |
|----------------|--------------|-------|
| 1 | 3 | 88 |
| 2 | 10 | 298 |
| 3 | 17 | 453 |
| 4 | 11 | 450 |
| 5 | 4 | 85 |
| All grades | 45 | 1,374 |

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TABLE 23

Number of Mines in Eastern Pennsylvania, by Quality Letter
and Subdistrict, 1939
(For Size Group 3, Run-of-Mine)

| Sub-district | Quality Letter | | | | | | | | Total |
|--------------|----------------|----|----|-----|-----|-----|-----|-----|-------|
| | A | B | C | D | E | F | G | H | |
| 1 | | | | | | 14 | 31 | | 45 |
| 2 | | | | | 9 | 1 | | 29 | 39 |
| 3 | | | 41 | | | | 2 | 1 | 44 |
| 4 | | | | | | | 15 | | 15 |
| 5 | | | | | 24 | 3 | 11 | 2 | 40 |
| 6 | | | | | 44 | 37 | | | 81 |
| 7 | | | | | | 44 | | | 44 |
| 8 | | | | 6 | 34 | 12 | | 21 | 73 |
| 9 | | | 3 | 14 | 7 | | 6 | | 30 |
| 10 | | | | | | | | 29 | 29 |
| 11 | | | | | | | 5 | 5 | 10 |
| 12 | | | 1 | | | | 8 | 2 | 11 |
| 13 | | | | 6 | 1 | 4 | 1 | 2 | 14 |
| 14 | | | | | 9 | 17 | 3 | | 29 |
| 15 | | | | | 2 | 18 | 4 | | 24 |
| 16 | | | | | 33 | | 5 | | 38 |
| 17 | | | 6 | 3 | 10 | | | | 19 |
| 18 | | | | 22 | 28 | 39 | 1 | | 90 |
| 19 | | 4 | 4 | | 1 | | | | 9 |
| 20 | | | 5 | | | 3 | | | 8 |
| 21 | | | 4 | 6 | | 20 | 1 | 3 | 34 |
| 22 | | | | | 16 | 11 | | 1 | 28 |
| 23 | | | | | | 1 | 10 | 4 | 15 |
| 24 | | | 3 | 6 | 11 | 2 | | 1 | 23 |
| 25 | | | | | | 1 | 1 | 1 | 3 |
| 26 | | | 15 | 1 | 2 | | | | 18 |
| 27 | 2 | 7 | | | | 25 | | | 34 |
| 28 | | | | | | | 6 | 3 | 9 |
| 29 | | | | | 38 | 42 | | | 80 |
| 30 | 3 | 1 | 3 | | 6 | | | 1 | 14 |
| 31 | 4 | | 4 | 6 | | | | | 14 |
| 32 | | | | 4 | 4 | 6 | 3 | | 17 |
| 33 | 20 | | | | 4 | 1 | | | 25 |
| 34 | 6 | | | 1 | | 2 | | 2 | 11 |
| 35 | | | | | 1 | 1 | | | 2 |
| 36 | 1 | | | 2 | 19 | 1 | | | 23 |
| 37 | | 6 | | | 10 | 3 | | | 19 |
| 38 | | | 4 | 12 | 2 | | 1 | | 19 |
| 39 | 1 | 39 | | | | 18 | | | 58 |
| 40 | | | 1 | | | 2 | 2 | 9 | 14 |
| 41 | | | | | 4 | 13 | 15 | 7 | 39 |
| 42 | | | | | 11 | | | 6 | 17 |
| 43 | | | | 36 | 16 | 14 | | 28 | 94 |
| 44 | | | | 16 | 1 | | | 47 | 64 |
| 45 | | | | 1 | 7 | | | | 8 |
| Total | 37 | 57 | 94 | 142 | 354 | 355 | 131 | 204 | 1,374 |

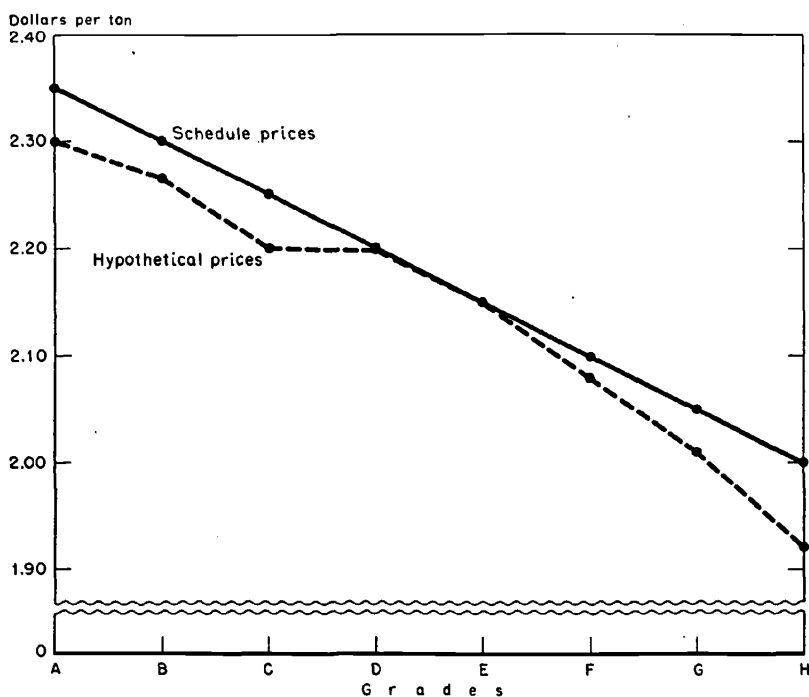
Source: Compiled by the authors from a list of mines in the *Federal Register*, January 19, 1939, pp. 287-98.

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The insert on page 157 gives only the quality grades in any one sub-district. Table 23 shows wide ranges within some subdistricts. There is, however, a tendency for a larger percentage of mines to fall into a single quality grade and for the spread between grades to be narrower than in the classification by seams.

It is apparent that the seam and the subdistrict of Eastern Pennsylvania in which a mine operated do not necessarily determine the quality letters assigned to its products. Chart 9 for the predominant size, run-of-mine, shows that the determining factor is not to be

CHART 9
Comparison of Schedule Prices and Hypothetical Prices
for Run-of-Mine Coal in Eastern Pennsylvania



Source: Schedule prices are the uncoordinated minimum proposed by the district board; hypothetical prices are based on the National Recovery Administration's Technical Board formula. After a diagram prepared in the Office of the Consumers' Counsel. The computations are those of the Counsel's staff.

found in the characteristics of coal analysis, although these characteristics are by no means negligible. This chart compares the uncoordinated prices proposed by District Board 1 with the hypo-

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thetical prices derived from coal analyses by the use of the NRA Technical Board formula. In the computation it was assumed that the basic grade E was to be priced at \$2.15.

How, then, are all these deviations from the characteristics of particular seams, subdistricts, and coal analyses to be explained? They may be accounted for in a large part—as the district board itself pointed out—by the consideration that was given to consumer acceptance and market experience.

Coal analyses were used only in classifying mine-run coal. The Board was of the opinion that rigid application of the mine-run classification to all other sizes would fail to establish the true relative market value of these coals, and would not give the producers a fair competitive opportunity. In classifying the coals in the four other size groups, therefore, further attention was given to market experience; and other related factors, including values as to uses and preparation of the coal, were taken into account. Notwithstanding this fact, all but 49 of the 1,374 mines listed in the proposed price schedule carried the quality letter assigned to mine-run coal for all other size groups where more than one size group was produced. Incidentally, 28 of the 49 mines were located in one seam, the lower Kittanning (B), and most of the exceptions applied to one size group only.

The Board in Illinois had the task of classifying the coals of 823 mines whose production in 1937 amounted to 50-odd million tons. About 92 per cent of this coal was produced by 158 rail-connected mines, called "shipping mines" because part of their coal is transported by rail. The remaining 8 per cent was produced by 665 mines which are referred to as local or truck mines.⁴⁵ The Board centered its attention upon the shipping mines, and turned the task of classifying the coals of the local mines to its Committee on Classification of Coals and Prices Representing Local Mines.

From federal and state agencies, and in many instances directly from the operators, the Board obtained for each mine the tonnage produced by sizes in 1937, the seam mined, the mining system used, the manner of recovery, the preparation process, the physical appearance of the coal as loaded, and other pertinent information on physical characteristics. Code members operating 105 shipping

⁴⁵ Actually the mines producing coal in this district in 1937 numbered 1020 and the output amounted to approximately 52 million tons. The figures given above are those for the mines in operation when the proposed schedule of uncoordinated prices was prepared. The output of the mines included in the initial classification amounted to 98 per cent of the 1937 tonnage.

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mines and one local mine filed 544 separate analyses. In addition independent coal analyses were made at the Board's direction of all coal seams mined in the district.

The 26 size groups established for the district (See Table 24) were combined into three major classes: coarse or large coals, fine coals which were washed or cleaned, and raw fine coals. It should be noted that Illinois is one of the few districts which established major classes of coal and applied the classification procedure separately to each class. Having established these major classes, the Board next decided on a basic size group for each class. Size group 2 was taken for the coarse coals, size group 12 for the fine washed or cleaned coals, and size group 24 for the fine raw coals.

When rating procedures were used, some kind of yardstick became necessary. To construct such a device, the Board first selected the coal analyses (all made by the same commercial testing company) of 59 shipping mines whose coals were considered to be representative of those produced by mines in this district. Next it picked out ten mines in southern Illinois which produced excellent coals. All of these mines produced coarse sizes, four the fine washed or cleaned sizes, and six the fine raw sizes. To obtain a base coal to which to relate other coals in each major class, the Board averaged the coal analyses of all ten mines for the coarse coals, of the four mines producing fine cleaned or washed coals, and of the six mines producing fine raw coals. The average analyses in each class were called grade A coals.

Two formulae were used to rate the coals of the 59 mines: a "coarse coal formula" which was applied to the large sizes and a "fine coal formula" which was used for both the cleaned and raw fine sizes.

The factors considered in rating the various coals were:

| <i>Factors</i> | <i>Formula</i> | |
|-------------------------------------|------------------|--------------------|
| | <i>Fine Coal</i> | <i>Coarse Coal</i> |
| Group A | | |
| Heat content | yes | yes |
| Moisture content | yes | yes |
| Ash content | yes | yes |
| Group B | | |
| Ash allowance | yes | no |
| Sulphur allowance | yes | yes |
| Ash-softening temperature allowance | yes | no |
| Moisture content | no | yes |

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TABLE 24

Size Classification in Illinois, 1939

| Coarse Coal—Washed, Air Cleaned, or Raw | | Fine Coal | | |
|--|------------|-----------------------|----------------------|----------------------|
| | | Washed or Air Cleaned | | Raw |
| Group No. 1: | | Group No. 7: | Group No. 15: | Group No. 21: |
| 10" lump | 8" × 3" | 1½" × 1" | 2" × 5/8" | 3/8" × 10 Mesh |
| 9" | 8" × 2" | 1½" × 3/4" | 2" × 7/16" | 3/16" × 10 Mesh |
| 8" | 8" × 1½" | 1¼" × 1" | 2" × 5/16" | 3/8" × 1¼" |
| 7" | 8" × 1¼" | 1¼" × 3/4" | 2" × 1/8" | Group No. 22: |
| 6" | 7" × 4" | 1¼" × 13/16" | | 3/8" × 48 Mesh |
| 4" | 7" × 3" | | Group No. 16: | 5/16" × 48 Mesh |
| 9" × 6" | 7" × 2½" | Group No. 8: | 1½" × 1" | Group No. 23: |
| 9" × 4" | 7" × 2" | 2" × 5/16" | 1½" × 3/4" | 2" × 0" |
| 9" × 2" | 7" × 1½" | Group No. 9: | 1½" × 3/4" | Group No. 24: |
| 8" × 5" | 7" × 1¼" | 1½" × 10 Mesh | 1¼" × 1" | 1½" × 0" |
| 8" × 4" | 6" × 4" | 1½" × 5/16" | 1¼" × 3/4" | 1½" × 0" |
| | | 1½" × 1/4" | Group No. 17: | 1½" × 0" |
| Group No. 2: | | 1¼" × 5/16" | 1½" × 5/8" | 1¼" × 0" |
| 3" lump | 5" × 3" | 1¼" × 1/4" | 1½" × 1/2" | 1" × 0" |
| 2½" | 4" × 3" | Group No. 10: | 1½" × 7/16" | 3/4" × 0" |
| 6" × 3" | 4" × 2½" | 1" × 3/8" | 1½" × 3/8" | 1½" × 0" |
| 6" × 2½" | | 1" × 5/16" | 1½" × 5/16" | 7/16" × 0" |
| Group No. 3: | | 3/4" × 1/2" | 1½" × 1/4" | Group No. 25: |
| 2" lump | | 3/4" × 5/16" | 1½" × 1/8" | 3/8" × 0" |
| 6" × 2" egg | | 3/4" × 1/4" | 1¼" × 3/8" | 5/16" × 0" |
| 5" × 2" egg | | 3/8" × 5/16" | 1¼" × 5/16" | 1/4" × 0" |
| 4" × 2" egg | | 3/8" × 4 Mesh | 1¼" × 1/4" | 3/16" × 0" |
| 3" × 2" egg | | Group No. 11: | 1¼" × 3/16" | 1/8" × 0" |
| Group No. 4: | | 2" × 0" | Group No. 18: | 6 Mesh × 0" |
| 1½" lump | 4" × 1¼" | 2" × 28 Mesh | 1" × 1/2" | Group No. 26: |
| 1¼" | 4" × 3/4" | Group No. 12: | 1" × 7/16" | 10 Mesh × 0" |
| 6" × 1½" | 4" × 1/4" | 1½" × 28 Mesh | 1" × 3/8" | 28 Mesh × 0" |
| 6" × 1¼" | 3" × 1½" | 1¼" × 28 Mesh | 1" × 5/16" | 48 Mesh × 0" |
| 6" × 1" | 3" × 1¼" | 1" × 28 Mesh | 1" × 1/4" | |
| 6" × 3/4" | 3" × 3/4" | 3/4" × 28 Mesh | 7/8" × 5/16" | |
| 6" × 1/2" | 3" × 5/16" | 1½" × 0" | 7/8" × 1/16" | |
| 5" × 1½" | 2½" × 1½" | 1¼" × 0" | 3/4" × 1/2" | |
| 5" × 3/4" | 2½" × 1¼" | 1" × 0" | 3/4" × 3/8" | |
| 4" × 1½" | 2½" × 1" | 3/4" × 0" | 3/4" × 5/16" | |
| | | 1/2" × 0" | Group No. 19: | |
| Mine run modified | | 7/16" × 0" | 2" × 10 Mesh | |
| Locomotive fuel | | Group No. 13: | 2" Crushed | |
| Reclaimed lump | | 1" × 10 Mesh | 2" Modified | |
| Railroad egg | | 3/8" × 10 Mesh | Group No. 20: | |
| Mixed lump | | 5/16" × 10 Mesh | 1½" Modified | |
| Group No. 5: | | 5/16" × 48 Mesh | 1½" × 10 Mesh | |
| 2" × 1½" | 2" × 1" | Group No. 14: | 1½" × 28 Mesh | |
| 2" × 1¼" | 2" × 3/4" | 3/8" × 0" | 1¼" Modified | |
| Group No. 6: | | 5/16" × 0" | 1" × 10 Mesh | |
| Mine Run Straight | | 1/4" × 0" | 1" × 28 Mesh | |
| Mine Run Crushed | | 10 Mesh Dust | 3/4" × 1/8" | |
| Mine Run 6" | | | 3/4" × 10 Mesh | |
| Mine Run 6" Crushed | | | 3/4" × 1/16" | |
| Mine Run 5" Crushed | | | 3/4" × 28 Mesh | |
| Mine Run 4" | | | 1/2" × 1/2 mm. | |
| Mine Run 3" | | | 7/16" Stoker | |
| Mine Run 2½" | | | | |
| 2½" Modified | | | | |

Source: *Federal Register*, February 28, 1939, pp. 1052-53.

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Parenthetically, it may be noted that the Illinois District Board listed market history as one of the classifying factors it considered. Unfortunately the relationship of market history to the rating formula was not indicated by the Board.

In general the formulae used by the Board to classify its coals related the coals of each of the 59 mines to the base coal of each major class (1) by deducting from the heat content (Btu) of a given coal the Btu losses incurred for moisture and ash content (group A factors) in excess of the base coal, and expressing the remainder as a percentage of the heat content of the base coal, (2) by deducting from the percentage heat content of a given coal the allowances for certain physical characteristics (group B factors) when present in the coal in excess of an established minimum, and (3) by applying the percentage rating of a given coal (arrived at by subtracting from 100 the percentage deductions and allowances granted for both sets of factors used in the formula) to the price assigned to the base coal and expressing this price as a letter grade. Tables 25 and 26 indicate how the fine coal formula was applied.

When all 59 mines had been assigned net heat percentage ratings, the Board had the task of expressing them in letter grades as required by the Commission. This was done in the following manner: the base coal which had been given the grade of A was assigned a price, say \$1.71—the price prevailing in the market for that coal. The price of the base coal was then multiplied by the net heat percentage rating assigned to the coal of each mine included in the sample producing coal in this size group. To illustrate: let us suppose that the net heat percentage rating from one of the mines in the group of 59 was 97 per cent as determined by the formula. This percentage of \$1.71 is \$1.66 or five cents below the \$1.71. This coal was graded B. Similarly, another coal of the same size with, let us say, a net heat percentage rating of 91 per cent would carry a price of \$1.56 or 15 cents below \$1.71, and this coal, since it was three five-cent intervals below the price of the base coal, was graded D. In this manner, letters were assigned to the coal of all of the 59 shipping mines used in constructing the yardstick. The quality grades assigned to coals in the basic size group applied to all other size groups in the major class.⁴⁶

⁴⁶ In a conversation with the authors, several members of the Coal Division pointed out that such a rating technique would be more feasible in Illinois, where coals are relatively uniform, than in some other districts, such as Eastern Pennsylvania, where considerable variations in quality are found.

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TABLE 25

Application of Illinois Board's Fine Coal Formula, 1939

| Item | Base Coal | | Given Coal | | | Computed Value (per cent) (6) |
|--|---------------------------------|---------|-------------------------------------|--------------------|---------------------|-------------------------------|
| | Physical Measure (per cent) (1) | Btu (2) | Physical Measure (3) (per cent) (3) | (1) (per cent) (4) | Btu (5) | |
| Heat content | | 11908 | | | 10345 | |
| Moisture content | 8.33 | | 12.10 | 3.77 | 47.35 ^a | |
| Ash content | 10.47 | | 17.34 | 6.87 | 710.70 ^b | |
| Net heat content ^c | | | | | 9586.95 | |
| Net heat, per cent of base ^d | | | | | | 80.508 |
| Allowances: | | | | | | |
| For ash | | | 17.34 | | | -3.5 ^e |
| For sulphur | | | 6.87 | | | -2.5 ^e |
| For ash-softening temperature | | | 1976 ^f | | | -1.0 ^e |
| Net heat percentage ratings ^g | | | | | | 73.508 |

^a Thus, $.0377 \times 1256 \text{ Btu} = 47.35 \text{ Btu}$. The 1256 Btu represents the amount of heat required to dispel 1 pound of moisture. As the heat content of this coal is measured in Btu per pound, the computation just given will measure the Btu loss incurred due to the "excess moisture" of 3.77 per cent.

^b The Board assumed that the volume of excess ash was directly proportionate to the Btu loss thereby incurred. Thus, $6.87 : 100 :: 710.70 : 10345$. One Illinois code member, however, objected to this assumption and argued that "excess ash" did not involve nearly so much loss of heat. After hearing his facts the Commission directed the District Board to halve the influence of "excess ash" in its "fine coal formula." Revised, the above expression would read: $6.87/2 : 100 :: 710.70/2 : 10345$. The net heat content would become 9942.30 Btu or 83.493 per cent instead of 9586.95 or 80.508 as in the above table. The final figure after subtracting the allowances, would be 76.493 per cent.

^c Heat content minus Btu deductions for "excess moisture" and "excess ash." ($10345 - 47.35 - 710.70$).

^d That is, 9586.95 as a percentage of 11908.

^e From the appropriate section of Table 26.

^f In degrees Fahrenheit, not per cent.

^g Net heat, per cent of base minus allowances for ash, sulphur, and ash-softening temperature.

Source: Data obtained from *Federal Register*, February 28, 1939, pp. 1054-55.

The coarse coal formula differed from that used for fine coals in several respects. In the first place the allowance for excess ash content was 1.5 per cent of Btu content for every one per cent of ash above the established minimum. In the second place, no allowances were given for ash content or for ash-softening temperature, presumably because domestic consumers generally do not give consideration to these factors. Deductions, however, were made for sulphur because it is a detriment not only in use but in appearance,

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TABLE 26

Schedule of Allowances for Group B Factors Used
by Illinois Board in Rating its Coals, 1939

| <i>Excess Ash (Applied to Fine Coals)</i> | | <i>Variations in Ash-Softening Temperature (Applied to Fine Coals)</i> | |
|--|-----------------------------|--|-----------------------------|
| <i>Physical Measure (per cent)</i> | <i>Value (per cent)</i> | <i>Softening Temperature (degrees Fahrenheit)</i> | <i>Value (per cent)</i> |
| Under 11 | 0.0 | 2500—2599 | +2.0 |
| 11—11.99 | -0.5 | 2400—2499 | +1.5 |
| 12—12.99 | -1.0 | 2300—2399 | +1.0 |
| 13—13.99 | -1.5 | 2200—2299 | +0.5 |
| 14—14.99 | -2.0 | 2100—2199 | 0.0 |
| 15—15.99 | -2.5 | 2000—2099 | -0.5 |
| 16—16.99 | -3.0 | 1900—1999 | -1.0 |
| 17—17.99 | -3.5 | | |
| 18—18.99 | -4.0 | | |
| 19—19.99 | -4.5 | | |
| 20—20.99 | -5.0 | | |
| <i>Excess Sulphur (Applied to Coarse and Fine Coals)</i> | | <i>Excess Moisture (Applied to Coarse Coals)</i> | |
| <i>Physical Measure (per cent)</i> | <i>Value (per cent)</i> | <i>Physical Measure (per cent)</i> | <i>Value (per cent)</i> |
| Under 2 | 0.0 | Under 10 | 0.0 |
| 2—2.99 | -0.5 | 10—11.99 | -1.0 |
| 3—3.99 | -1.0 | 12—13.99 | -2.0 |
| 4—4.99 | -1.5 | 14—15.99 | -3.0 |
| 5—5.99 | -2.0 | 16—17.99 | -4.0 |
| 6 and over | -2.5 | 18 and over | -5.0 |

Source: *Federal Register*, February 28, 1939, pp. 1054-55.

and an additional allowance was provided for excess moisture content since it reflected more closely than any other characteristic the degree of degradation in the handling and storage of the large sizes of coal produced in this district.

Having ranked the 59 representative mines in each of the three major classes, the Board then graded the coals of the other 99 shipping mines. This task was accomplished for each mine by finding (1) from among the 59 mines one which operated in the same seam and which had coal of comparable quality, and (2) by assigning a corresponding grade.⁴⁷

⁴⁷ The method used to compute differentials for specially treated coals may be of interest. The Board, working with the coals of the ten mines taken as a base, compared the Btu contents of the four mines whose coals were washed with those of the remaining six. The average of the former was 12,251 Btu and of the latter 11,908. Thus the heat content of the raw coal was only 95.692 per cent as great as that of the washed coal. With the

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The same general approach was followed by the Committee in grading the 665 local (truck) mines. The Board and the Committee applied to each local mine the classification which the Board had placed on the nearest rail shipping mine.

2. TASK INVOLVED IN ESTABLISHING PRICE DIFFERENTIALS AND TENTATIVE UNCOORDINATED PRICES FOR SIZES AND GRADES OF COAL

At this point in our analysis each district board had established a classification of coal which listed for each mine the sizes produced by it and the quality grades assigned to its coal in each size class. Table 27 reproduces (with some modifications for the purpose of clarity) the uncoordinated-price schedule for selected mines in Eastern Pennsylvania. Section A of this table reveals the type of information made available by the classifying procedure.

The next job of the district boards was to assign money values to the letters opposite each mine. Section B of the table shows the product of this phase of the pricing procedure. It will be seen that Eastern Pennsylvania proposed ten grades or quality classes of coal. These grades were expressed in letters by all boards at the request of the Commission because it was known that the district boards or the Commission itself would frequently find it necessary during the coordination stage to establish one mine price for a given coal when sold in one market, and another when sold in a different market, and because the Act provided that prices were to be modified from time to time in order to reflect changes in costs. Obviously a system of lettering coals under these circumstances would be more satisfactory than prices for identifying grades. To carry out the task of assigning a price to each letter grade the boards could start working either with the quality classes which reflect the vertical relationship between the various coals or with size classes (or groups) which reflect their horizontal relationship.

A coal of size group 12 (washed) priced at \$1.80, the corresponding raw coal (size group 24) was 4.308 per cent or \$.078 lower. The Board also "recognized the fact that in the washing process a certain percentage of the fines were removed with dewatering screens or other similar contrivances, and that as a result there is an according improvement in the size consist. The Board evaluated this difference at 2.2 cents per ton, which amount added to the 7.8 cents quality difference . . . made the ten cents differential in the base prices established by the Board for the base coals used for washed and raw screenings." Subsequently this difference was reduced to \$.09. (*Federal Register*, February 28, 1939, p. 1058.)

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a. *Price differentials for quality classes or grades.* In proposing price differentials for quality classes, most boards selected a basic size or size group for primary analysis. In a few districts more than one basic size was selected, as for example, in Indiana (District 11) where the Board used one basic size for domestic coals and another for industrial coals, or in Illinois (District 10) where it will be recalled three basic sizes were utilized. The basic size or sizes having been selected, the next step was to ascertain the price spread that normally prevailed between the best and poorest coal within the size group.

In Eastern Pennsylvania the Board selected mine-run coal, the important size in size group 3, as the basic size because it constituted a substantial part of the district's tonnage. The total price spread of the eight grades of mine-run coals was found to be 35 cents. It was essential that the total price differential established by the Board conform with market experience, because a narrower spread would shift consumption to the better grades of coal and a broader one would probably shift consumption to the poorer grades.

The next task confronting the district boards was to divide the normal price spread existing between the best and poorest coals within the basic size group among the component quality classes. Here again, existing price relationships had to be considered. Asserting that minimum quality differences between bituminous coals are seldom expressed in intervals of less than 5 cents, the boards as a rule measured grade differences in intervals of 5 cents or multiples thereof.

In Eastern Pennsylvania the total price spread of 35 cents for mine-run coal was divided into seven equal parts. Presumably the use of a 10-cent interval would have blurred the competitive picture, and would have arbitrarily increased the market value of some coals and depressed others. On the other hand, an interval of less than 5 cents would have introduced an unnecessary and unwanted complexity in the market. Table 28 illustrates the procedure used to establish differentials for quality grades. At this stage the reader should confine his attention to the vertical relationship between the coals in size group 3. It will be seen that grade E (No. 3) in the basic size group was made the key coal to or from which grade differentials were added or subtracted and that the total spread between classes A and H is 35 cents. In the Board's opinion the 5 cent differential between adjoining grades above or below class E was necessitated by both the difference in intrinsic value of the coals and the needs of the district in order to market its

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TABLE 27
Uncoordinated-Price Schedules for Selected Mines in Eastern Pennsylvania, 1939

| | | A. Quality Grades for Individual Mines, by Coal Size Group | | | | | | | | | | | | |
|----------------------|------------------|--|--------------|--|---|---|---|---|---|---|--|---|---|--|
| Company | Mine | Sub-district | Seam or Kind | Lump and Double Screen Coal with Top Size 2" over 2" | | | Double Screen Coal with Top Size 2" and under | | Mine-Run, Modified Mine-Run, and Resultant with Top Size 2" over 2" | | Mine-Run, Resultant—Top Size over 3/4" and not over 2" | | Minus Resultant with Top Size not over 3/4" | |
| | | | | 1 | 2 | 3 | 2 | 3 | 4 | 5 | | | | |
| Berwind-White | Maryland | 30 | B | A | A | A | A | A | A | A | A | A | C | |
| | No. 35 C' | 33 | C' | E | E | E | E | E | E | E | E | E | E | |
| | No. 37 C' | 33 | C' | E | E | E | E | E | E | E | E | E | E | |
| Beunier | No. 40 C' | 33 | C' | E | E | E | E | E | E | E | E | E | E | |
| | Miller Run No. 6 | 17 | B | | | | | | | C | C | C | C | |
| | Irvona No. 6 | 26 | B | C | C | C | C | C | C | C | C | C | C | |
| Big Bend Big Vein | Castle | 43 | Big Vein | D | | | | | | D | D | D | D | |
| | Castle G | 43 | Big Vein | | | | | | | D | D | D | D | |
| | Union 5 | 43 | Big Vein | | | | | | | F | F | F | F | |
| Biggs & Martin | Biggs & Martin | 44 | Bakerstown | | | | | | | H | H | H | H | |

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TABLE 27 (concluded)
 B. Prices, by Grade and Size Group
 (Dollars per net ton, f.o.b. mine)

| Grade | Size Group | | | | |
|----------------|------------|------|------|------|------|
| | 1 | 2 | 3 | 4 | 5 |
| A | 2.45 | 2.35 | 2.35 | 2.30 | 2.20 |
| B | 2.40 | 2.30 | 2.30 | 2.25 | 2.15 |
| C | 2.35 | 2.25 | 2.25 | 2.20 | 2.10 |
| D | 2.30 | 2.20 | 2.20 | 2.15 | 2.05 |
| E | 2.25 | 2.15 | 2.15 | 2.10 | 2.00 |
| F | 2.20 | 2.10 | 2.10 | 2.05 | 1.95 |
| G | 2.15 | 2.05 | 2.05 | 2.00 | 1.90 |
| H | 2.10 | 2.00 | 2.00 | 1.95 | 1.85 |
| H ₁ | | | | 1.90 | 1.80 |
| H ₂ | | | | 1.85 | 1.75 |

Source: *Federal Register*, January 19, 1939, pp. 287, 288, and 298.

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TABLE 28

Procedure Followed in Eastern Pennsylvania in Computing Price Differential for a Sample Quality Grade and Size Group, 1939 (dollars)

| Quality Grade | Size Group | | | | |
|---------------|------------|------|----------------|------|------|
| | 1 | 2 | 3 ^a | 4 | 5 |
| A | | | +.20 | | |
| B | | | +.15 | | |
| C | | | +.10 | | |
| D | | | +.05 | | |
| E | +.10 | +.00 | Base | -.05 | -.15 |
| F | | | -.05 | | |
| G | | | -.10 | | |
| H | | | -.15 | | |

^a This size group includes: 1) Mine-run coal, 2) Modified mine-run coal, and 3) Minus resultant with top size over 2". All coals within any one size group of a given quality grade carry the same letter grade and are assigned the same uncoordinated price.

Source: *Federal Register*, January 19, 1939, pp. 279-81.

coals in the territory constituting its principal market, namely, east of Ohio and north of the Potomac River.

b. *Price differentials for size groups.* In computing price differentials for size groups, the district boards presumably sought to retain, so far as possible, the price differences that had prevailed under free competition. As was the case in setting up quality differentials, the boards selected a basic size group and a key quality class or grade. Working with one of the coals designated in the basic size group, say mine-run, the Board of District 1 drawing on the experience of its members in marketing coals, set up, for the key grade, price differentials between E coal in the basic size group and the E coal in each of the other size groups. As shown in Table 28, size group 3 and class E were taken as the basic size group and key quality class respectively. It will be seen that in relation to the basic size group, the E coal in size group 2 carried no differential and that the coal in size group 1 carried an extra 10 cents. The E coal in size group 4, on the other hand, was 5 cents and that in size group 5 15 cents below the E coal in the basic size group.⁴⁸ The final step was to assign to each quality class in the

⁴⁸ According to the District Board, size group 1 was priced \$.10 above size group 3 because the former coal goes to domestic buyers where credit risks are greater and orders are smaller than on industrial sales. The difference could not exceed \$.10, however, because the domestic buyers would

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basic size group the differentials which had been established, and then to compute the prices in the other size groups by applying the differentials that had been established. For Eastern Pennsylvania coals, the result would be that shown in Table 29. Actually

TABLE 29
Price Differentials for Bituminous Coals in Eastern Pennsylvania,
by Size Group and Quality Class, 1939
(dollars)

| Quality Class | Size Group | | | | |
|---------------|----------------|----------------|-------|----------------|----------------|
| | 1 ^a | 2 ^a | 3 | 4 ^b | 5 ^b |
| A | + .10 | + .00 | + .20 | -.05 | -.15 |
| B | + .10 | + .00 | + .15 | -.05 | -.15 |
| C | + .10 | + .00 | + .10 | -.05 | -.15 |
| D | + .10 | + .00 | + .05 | -.05 | -.15 |
| E | + .10 | + .00 | Base | -.05 | -.15 |
| F | + .10 | + .00 | -.05 | -.05 | -.15 |
| G | + .10 | + .00 | -.10 | -.05 | -.15 |
| H | + .10 | + .00 | -.15 | -.05 | -.15 |

^a Amount shown is added to the prices arrived at in size group 3.

^b Amount shown is subtracted from the prices arrived at in size group 3.

Source: *Federal Register*, January 19, 1939, p. 298.

most districts omitted this step and instead assigned a price to the selected coal and applied the size differentials to the price of each quality class in the basic size group. Thus, to obtain the prices of grade A coals in the various size groups it was necessary to ascertain the price of the class A coal in size group 3 (in this case 20 cents above grade E coal) and then to add or subtract the differentials designated for each of the remaining size groups.

Theoretically, this method would be workable no matter what size group was chosen as basic or what grade was selected to be the key quality class so long as price differentials for sizes of coal were uniformly applied to each quality class. In practice, however, it appears that the size and grade of coal chosen was generally one that

object—they complain that the lump and egg sizes contain too much fine coal, the district's coal being soft and friable.

The Board stated that size group 2 coals compete directly with those of size group 3 and thus should take identical prices.

In the Board's opinion the presence of "fines" in size group 4 reduces the value of that size \$.05 below size group 3.

Coal in size group 5 is used almost entirely in pulverized-fuel installations, which can be readily converted to burn oil or gas. According to the Board, this coal must be priced \$.15 below size group 3 if it is to compete with oil and gas. (*Federal Register*, January 19, 1939, pp. 280-81.)

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had come to be well known in the district usually because of its importance from the standpoint of production. If such a coal was also common in competing districts it was so much the better, because in the coordination stage of price fixing the deliberations of the districts would be facilitated by the use of common points of reference.

The method of computing price differentials for sizes of coal admits of variations and elaborations. In Indiana (District 11), for example, the Board used two base size groups, one for the large domestic coals and another for the industrial sizes:

| <i>Domestic Size Groups</i> | | <i>Industrial Size Groups</i> | |
|---|---------------------------------------|-------------------------------|---------------------------------------|
| <i>Size Group</i> | <i>Relation to Base (dollars)</i> | <i>Size Group</i> | <i>Relation to Base (dollars)</i> |
| 1 | Base | 7 | +.20 |
| 2 | -.15 | 8 | +.20 |
| 3 | -.20 | 9 | +.15 |
| 4 | -.30 | 10 | +.10 |
| 5 | -.35 | 11 | Base |
| 6 | -.50 | 12 | -.15 |
| Size Group 18, run-of-mine was not related to either base but "was classified according to value at the several mines." | | 13 | -.30 |
| | | 14 | -.20 |
| | | 15 | -.25 |
| | | 16 | -.80 |
| | | 17 | -.60 |

c. *Method used to set tentative uncoordinated prices.* Differentials for both sizes and qualities of coal having been computed, the task of converting letter grades into actual prices was a simple one. In order that the level of prices should be reasonably close to the level that should ultimately prevail, many districts applied to their coal of preponderant tonnage—usually the key quality coal in the basic size group—the weighted average costs of the minimum price area in which they were located. In District 1 the preponderant coal was grade E run-of-mine. This coal was given a price of \$2.15 which corresponded to the average cost of Minimum Price Area 1 (see Table 27, lower section) and to it were added the differentials shown in Table 29. In districts where no one coal was outstanding, the level of prices proposed was apparently related to the weighted average cost of the minimum price area by rough calculations or trial and error.

3. ADJUSTING TENTATIVE UNCOORDINATED PRICES TO MEET REQUIREMENTS OF THE ACT

The last step confronting the boards was to determine whether the average realization of the district would have equalled the 1937

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weighted average cost of its minimum price area if (1) the prices proposed had been in effect in 1937 and (2) the same quantities had been sold as were sold in that year. This was done by weighting each grade of coal in each size group by the tonnage sold by the district and then comparing the average computed realization with the weighted average cost of the minimum price area for the base period. Table 30 illustrates the application of the method.

TABLE 30

Method Used to Determine Whether Level of Uncoordinated Prices Conformed to the Act

| Size Group | Grade | Proposed Price (dollars) | Net Tons in 1937 (thousands) | Total Computed Realization (dollars) | Average Computed Realization (dollars) | Weighted Average Cost in Minimum Price Area (dollars) |
|------------|-------|--------------------------|------------------------------|--------------------------------------|--|---|
| 1 | A | 2.85 | 6 | 17,100 | | |
| 1 | B | 2.80 | 10 | 28,000 | | |
| 1 | C | 2.75 | 13 | 35,750 | | |
| 1 | D | 2.70 | 20 | 54,000 | | |
| 2 | A | 2.75 | 3 | 8,250 | | |
| 2 | B | 2.70 | 9 | 24,300 | | |
| 2 | C | 2.65 | 5 | 13,250 | | |
| 2 | D | 2.60 | 10 | 26,000 | | |
| 3 | A | 2.60 | 1 | 2,600 | | |
| Total | | | 140 | 371,000 | 2.65 | 2.60 |

An illustration prepared by the authors. The figures in the columns are incomplete and do not add up to the amount given.

4. HEARINGS ON MODIFICATIONS OF PROPOSED PRICES BEFORE SUBMITTING SCHEDULE TO COMMISSION

Order 247, "Rules and Regulations for the Proposal of Minimum Prices," directed each district board to submit its schedule of minimum prices to each Code member 15 days before filing it with the Commission.⁴⁹ Thus Code members were given an opportunity to protest the ratings and prices assigned to their coals. During the interim the board or its classification committee was required to hold hearings at which protests or objections were to be considered, and to make modifications when conditions made such action advisable. A copy of the revised schedule was then forwarded to each Code member and the schedule together with underlying data were transmitted to the Commission.

⁴⁹ *Ibid.*, August 13, 1938, p. 1988.

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5. MODIFICATIONS OF UNCOORDINATED PRICE SCHEDULES BY COMMISSION

Upon receipt of the uncoordinated price schedules, the Commission held hearings at which all interested parties were given an opportunity to protest. The district boards submitted evidence supporting their proposed prices and placed in the record, as exhibits, data which were used as a basis for classification and price fixing. Through witnesses, the boards also testified as to the factors considered, the reasoning followed, and the procedure employed by them in establishing proposed price schedules. The Commission also heard protests filed by Code members. The number of such protests for six districts and the action taken by the Commission are shown in Table 31.

TABLE 31
Number of Protests Filed by Code Members in Six Producing Districts and Action Taken by Bituminous Coal Commission

| Producing District Number | Code Members | Protests | Total Involved | Mines | | | Other Reclassi- fications |
|---------------------------------|-----------------|----------|-------------------|--------------|------------|-----------------------|---------------------------------|
| | | | | Reclassified | | Not Re- classified | |
| | | | | In Whole | In Part | | |
| 1 | 1542 | 8 | 16 | 4 | | 12 | 1 |
| 2 | 1148 | 1 | 2 | | | 2 | 1 |
| 3 | 395 | 10 | 21 | 1 | 10 | 10 | 4 |
| 4 | 1452 | | | | | | 200 |
| 6 | 120 | 2 | 2 | 2 | | | |
| 7 | 251 | 5 | 19 | | 2 | 17 | 1 |
| Total | 4908 | 26 | 60 | 7 | 12 | 41 | 207 |

Source: From an unpublished typescript memorandum, dated March 8, 1939, by C. D. Bray and William S. Eichelberger, entitled "Preliminary report on evidence in the record—Docket 15. Prices proposed by Districts within Price Area 1 (with the exception of District 5)," p. 70. Messrs. Bray and Eichelberger were in the Office of the Consumers' Counsel. The present writers omitted data for District 8.

The 26 protests in these six districts involved 60 mines. Seven of these mines were given new classifications, 12 were reclassified in part, and the remaining 41 were left unchanged. It will be noted that 207 mines whose managements did not protest the ratings assigned them were also subjected to reclassification. Of this total, 200 mines were located in District 4. Most of these mines were taken as a group and changed from O to Q classification in the

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nut-slack and slack sizes, presumably because these coals were somewhat lower in Btu content than those of competing mines that had been graded O.

E. Summary

In accordance with the terms of the Act and the instructions of the Commission, 22 district boards proposed for their respective districts uncoordinated minimum prices f.o.b. mine for kinds and qualities of coal, and sizes of coal.

In developing their price schedules all the boards set up size classifications: nine of these specifications included special size groups for coals when sold to certain users, five for coals subjected to additional treatment or preparation, and one for coals shot off the solid. Some of the remaining district boards preferred to provide for use classes, and for washed, cleaned, and crushed coals in their "price instructions and exceptions," and other explanations accompanying their price schedules, and still others by taking these factors into consideration in ranking or rating their coals for kinds and qualities. The size specifications varied greatly both as to the number of size groups and their contents.

Nineteen districts classified their coals for kinds and qualities. In developing these classifications all districts reported that they took market factors into account in one form or another, 15 that they gave consideration to physical characteristics of coal, 13 to the qualities of coal usually covered by coal analysis (heat and moisture content, the per cent volatile matter, fixed carbon, sulphur, and ash as well as the ash-softening temperature), and 11 to the characteristics of performance. Except for a few districts, the evidence does not reveal how much consideration was given to these factors. All districts proposed price differentials for one or more types of treated coals (primarily chemically treated coal), 18 districts for one or more classes of consumers (principally locomotive fuel) and two districts for coal bought during the spring and summer months. In classifying their coals, 18 districts used factor ranking based on coal-to-coal comparisons, and one district rated its coals in terms of definite units of measurements.

The letter grades assigned to each mine for its various sizes of coal were given monetary values by applying price differentials for both quality grades and size groups which, as pointed out earlier, were not uniform from district to district. The proposed prices were then tested and adjusted where necessary to meet the requirements

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of the Act with respect to the relationship that should prevail between the average realization of the district and the average mine cost of the minimum price area in which the district is located.

The tentative price schedule for each district was sent to all Code members, hearings were held to consider protests, and the revised schedule and its underlying data were transmitted to the Commission which held hearings, made certain modifications in the proposed prices for certain mines, and approved the uncoordinated price schedules of all 22 districts.

The above presentation of the procedures followed by the district boards in developing proposed minimum prices has been logical rather than chronological. In practice the sequential order outlined in this chapter was frequently blurred. In many districts some of the steps involved in classifying coals were carried out simultaneously and others were treated when and as data and time permitted. It should be stressed that in all districts judgment necessarily played an important role in determining minimum prices and that in most fields it probably was the dominant factor. The method of approach of the boards reflected the influence of a number of factors among which should be listed: the unavailability of statistical tools by which to measure certain relationships, the absence of a body of experience upon which to draw in carrying out a new undertaking, the indefiniteness of some of the criteria for classification and pricing laid down by the Act, the lack of detailed instructions from the Coal Commission, and the limited time allowed the district board members to perform the task.