

This is the report of one of six committees surveying the price problems of American industries and trade. The other five committees deal with steel and iron, oil, automobiles, textiles, and distributional costs and retail pricing.

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(Resolution of October 25, 1926, revised February 6, 1933)

Report of the
Committee on Prices in the
BITUMINOUS COAL
INDUSTRY

Prepared for
THE CONFERENCE ON
PRICE RESEARCH

National Bureau of Economic Research

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Preface

THE report of the Committee on Prices in the Bituminous Coal Industry is published by the National Bureau of Economic Research for the Conference on Price Research. This Conference is composed of representatives from universities and governmental and private research agencies interested in the advancement of knowledge in the wide field that is roughly defined by the term 'price economics'. As the result of a meeting in November 1935, called at the initiative of a committee representing the National Bureau of Economic Research and departments of economics in a number of American universities, a permanent, autonomous organization was created to stimulate and coordinate research dealing with costs, prices, and related topics. The present membership of the Conference includes the Universities of Chicago, Columbia, Cornell, Harvard, Minnesota, and Pennsylvania; the American Institute of Accountants; the National Association of Cost Accountants; the Bureau of Agricultural Economics, the Bureau of Labor Statistics, and the Central Statistical Board; the Brookings Institution; the Food Research Institute of Stanford University; and the National Bureau of Economic Research.

As its initial undertaking the Conference elected to survey five industries—bituminous coal, cotton textiles, petro-

leum, steel, and automobiles—for the purpose of defining the industrial and economic problems that center about prices, appraising existing data available to research workers and outlining programs of needed research. The present study is the first product of these investigations.

In no industry, perhaps, are issues involving prices of more interest to the public and to economists and of greater concern to public administrators than are those of bituminous coal. Here are problems of competition among rival producers and with substitute products; here are regional zones, imperfectly defined and cutting across one another in diverse ways, yet placing their impress on the pattern of production and distribution; here are varying grades and qualities, with corresponding price differentials; here are found a wide variety of users, ranging from households to railroads and great manufacturing industries; here are intricate connections between producers and carriers, and ownership relations that complicate pricing and distributional problems; and here, more recently, have been introduced elements of federal price control that are of especial interest, not alone because of their bearing on the organization and operations of this industry, but also because they exemplify issues of far wider import.

The objectives of Professor Fisher and his associates are clearly set forth in the opening pages of this monograph. With imagination, objective detachment, and rigorous fidelity to scientific standards of accuracy they have undertaken an experimental, exploratory survey of the tangled problems that center about bituminous coal prices. Their major purpose has been to clear the ground for needed research, rather than to make substantive contributions of their own, but the report that embodies their findings contains much that has value in its own right, as an addition to our knowledge of the bituminous coal industry.

This report points the way to research that will be of obvious and immediate value to the industry and to government, and of no less utility to those who are concerned with the more general aspects of economic organization today. It

is the hope of the Conference that the studies outlined in the report will be undertaken by interested agencies and individuals—by governmental bodies, organs of the industry, private research agencies, and favorably situated students. The Committee has indicated needed action. The field is open for the active work.

In defining some of the major problems that beset the industry and outlining research that will illuminate these problems, the Committee on Prices in the Bituminous Coal Industry has amply fulfilled its original purpose. But the work of the Committee has done more than this. It has provided a convincing demonstration of the possibility of disinterested cooperation in attacking contemporary industrial problems. Under the skillful and tactful leadership of Professor Fisher, a group of men of widely different connections, having a common interest in the economic problems of this troubled industry, were able to sit down together and explore, objectively and dispassionately, ways and means of obtaining a better understanding of the organization, operation, and market relations of the industry. Here, as in other fields in which the Conference on Price Research has sought to effect similar cooperation, good-will, and an active desire to clarify and solve perplexing issues have been encountered invariably. There are grounds here for hope that, on a wider front, such cooperation in the study of industrial ills may generate the knowledge essential to their solution. The future activities of the Conference will be directed toward the furtherance of this cooperation.

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Introduction

THE Committee on Prices in the Bituminous Coal Industry completed its report early in September 1937, four and a half months after the passage of the Bituminous Coal Act of 1937. Because the Commission created to administer the Act found it necessary to apply its energy to such pressing problems as developing an organization, promulgating a coal code, establishing statistical bureaus, approving the composition of district boards, developing standards of classification of coal, formulating marketing rules and regulations, and prescribing procedures for setting minimum prices, little had been accomplished up to that time in the development of a broad program of research and in the conduct of studies other than the compilation of 1936 costs and related data which were absolutely necessary for price-fixing purposes.

On July 1, 1937, the Commission took over the U. S. Bureau of Mines' statistical service for bituminous coal. In more recent months the Commission's statistical and research objectives and organization have been developed under the leadership of F. G. Tryon, formerly of the United States Bureau of Mines. The services to be rendered fall under two major divisions: (1) administrative statistics and (2) research and analysis.

The "administrative statistics branch" will concern itself with the collection and compilation of data pertaining to costs, sales realization, sales, prices, shipments, and contracts. Sales realization and detailed cost data have been compiled by divisions and areas for the years 1936 and 1937. In January 1938 the monthly collection of similar data was begun. Copies of all invoices and contracts are now being forwarded to the Commission. The analysis of invoices, now in process, will make available not only prices, transportation charges, discounts, premiums, and allowances for different classes and sizes of coal but also will show the quantity of coal shipped from producing fields and districts to various cities, states, and market areas, as well as the type of consumers supplied and the method of transportation.

Meantime to finish what is regarded as an indispensable base for its operations, the Commission is collecting detailed statistics of the movement of coal from each producing district to each destination in the United States, classified by size and grade.

The work to be carried out by the "research and analysis branch" will include market service reports, economic research, and technical research. The market service reports consist of "rapid-fire measurement of trends of all the factors of the market—production, consumption, stocks on hand, distribution, exports, imports, and price movements. To give a background for current changes, the long-time trends will also be developed to show demand, capacity, mechanical equipment, operating practice, employment and running time."

Those responsible for economic research, according to present plans, will "conduct fundamental studies of the economic principles underlying market control, price determination, and trade practices, as a basis for Commission policy", make "special investigations on particular problems, test and critically review the price structures" to be established by the Commission and examine "their effects upon consumers, the competitive standing of districts, and the demand for coal." The technical research division in

addition to supplying "technical advice on problems directly related to the administration of the system of minimum prices and fair trade practices", will "supervise certain special studies of 'new uses', 'conservation', and 'safety', specified in Section 14-A of the Act" and will make engineering studies relating to competing fuels and factors controlling costs such as seam conditions, mechanical equipment, and mining practices.

If the statistical studies now being carried on can be continued and if the contemplated program of research can be brought to completion and the data and findings obtained thereby published or otherwise made available to private research agencies and individuals, the execution of many of the projects suggested in this program of research for bituminous coal will be greatly facilitated and the comprehensiveness and value of their findings will be materially increased. Moreover, the statistics on consumption, flow of coal to markets, and inter-fuel competition will be substantially improved and much information previously supplied at irregular intervals will undoubtedly be regularly collected and compiled. Finally, should the research activities of the Commission be continued over a period of years, economists will be afforded an opportunity to test out in this industry many of the assumptions and theories which now prevail about the present functioning of the industrial system.

WALDO E. FISHER

INDUSTRIAL RESEARCH DEPARTMENT
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Objectives

Business and social policies can be formulated intelligently only if they are based upon realistic descriptions and interpretations of the continually changing organization and functioning of the industrial system. The development of this background of information depends upon: (1) accurate and comprehensive factual records relating to the functioning of industry; (2) an intimate knowledge of the forces and circumstances that lead business men to make decisions on policy and procedure in specific situations. The prerequisites of policy formation involve intensive study of selected industries and the coordination and integration of the data obtained and of the conclusions reached.

On the assumption that price research is not an end in itself but is rather a point of attack, the Committee on Prices in the Bituminous Coal Industry, in furtherance of the general purposes of the Conference on Price Research, has set itself the following specific objectives:

- 1) To state clearly the scope and operating characteristics of the bituminous coal industry that influence its price levels and price problems (see Part I)
- 2) To ascertain what price and related data are being currently collected for this industry (see Appendix I)
- 3) To appraise these data and to suggest means by which the factual record of the bituminous coal industry may be made more useful to the industry, the government, economists, and the public (see Appendix II)
- 4) To indicate those phases of the problems of prices that need further study and research and that are of greatest significance to the industry, economists, and the public (see Part II)
- 5) To outline a program of research (see Part II)

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**Report of the
Committee on Prices in the
BITUMINOUS COAL
INDUSTRY**

PART ONE

Characteristics of the Industry that have a Bearing on Price Problems

A COORDINATED program of research must necessarily be formulated with reference to the organization and operation of the industry under consideration and the problems and conditions that determine its price structure as well as its price trends and policies. For this reason the major economic characteristics of the bituminous coal industry that have a bearing on price and related problems are summarized briefly to give those not familiar with the general conditions in this industry a background for a better understanding of the program of studies outlined in Part II. Because of limitation of space and, more especially, because of the lack of essential data concerning important aspects of the industry, this statement of economic characteristics is sketchy. It should be modified and amplified as the studies proposed in Part II are made.

A THE BITUMINOUS COAL INDUSTRY

Bituminous coal holds a strategic place in the industrial order as a vast storehouse of heat and power, the utilization of which involves the livelihood of some 462,000 wage earners as well as tens of thousands of proprietors and salaried officers and employees. In 1935 it contributed 19.0 per cent of the total value of all minerals and 29.2 per cent of the

value of all fuels produced in the United States. Only the petroleum industry surpassed it in value of product and these two industries accounted for 46 per cent of the total value of all mineral products. Table 1 indicates the greater importance of the fuel industries, particularly petroleum and bituminous coal, as compared with gold, silver, copper, iron ore, and zinc mining.

TABLE 1

Value of Mineral Products, United States, 1935¹

PRODUCT	VALUE OF PRODUCT	PERCENTAGE OF TOTAL
Metals		
Copper, sales value	\$ 63,295,000	1.7
Gold	124,115,915	3.4
Iron ore	82,864,000	2.2
Silver	33,080,576	0.9
Zinc, sales value	36,272,000	1.0
Fuels		
Anthracite coal, Penna.	207,600,000	5.6
Bituminous coal	699,900,000	19.0
Natural gas	422,000,000	11.4
Natural gasoline	73,400,000	2.0
Petroleum	994,000,000	27.0
Total metallic products	721,600,000	19.6
Total mineral fuels ²	2,397,000,000	65.0
Total non-metallic products ³	553,000,000	15.0
Unspecified	16,400,000	0.4
Total mineral products	3,688,000,000	100.0

¹ *Minerals Yearbook, 1936*, pp. 41-43.

² Approximate.

³ Exclusive of mineral fuels.

As usually defined, the bituminous coal industry includes only the mining of bituminous coal and its distribution by those who produce it. With respect to the issues involved in an examination of price levels and price policies, this definition is too restricted in scope; for a substantial portion of the total production of bituminous coal is marketed by sales agencies that are not affiliated with operating companies and the mine price is, and has been for over a decade, determined largely by market rather than by mine factors.

The conversion of bituminous coal into heat and power requires the services and cooperation of three industries. The first is mining, which involves the recovery of coal, its preparation for the market, and its delivery to railroad cars, barges, or trucks at the mine.

The second industry is transportation, by rail, inland and coastwise water carriage, and truck. Of the coal loaded at the mines for shipment in 1934, 90.2 per cent was transported by rail, 4.4 per cent by waterways, and 5.4 per cent by trucks or wagons. These figures conceal the considerable tonnage that is carried by combined rail and water routes to Tidewater and the Great Lakes trade. The trucking of coal has been increasing rapidly since 1929. The importance of bituminous coal to the railroads is indicated by the percentage it constitutes of their total freight—from one-fourth to one-third. Because coal is dumped from mine cars into railroad cars, barges, and trucks—the storage of coal at the mine being at present held impracticable by the operators—mining and transportation are frequently regarded as one continuous process. The student of prices, however, must treat these two services as distinct, since transportation charges constitute a substantial portion of the total price paid by the large industrial consumer—on the average an amount somewhat larger than that paid to the mine operator. Important also is the tendency of freight rates to rigidity, while mine prices are subject to marked fluctuations. As a result, the combined prices, f.o.b. cars on the tracks at destination, are far more stable than mine prices, alone.

The third allied industry is marketing. In a typical week during the winter months of 1934 the bituminous coal mines loaded about 131,000 railroad cars holding approximately 7,000,000 tons of coal. These 131,000 cars were gathered from some 6,000 mines in thirty odd states and the coal was delivered to at least 90,000 carload lot buyers and to millions of consumers, mostly householders, who purchase coal in less than carload lots.

To understand the behavior of bituminous coal prices the

impact of the prices paid for competing fuels must be studied as well as the prices paid for the services performed by each of the three interrelated industries. However, the price problems of competing sources of energy fall outside this Committee's assignment.

B KINDS OF BITUMINOUS COAL

Bituminous coal is a general term embracing several coals that vary in chemical composition, physical structure, and burning characteristics. The engineer classifies them on the basis of the moisture, fixed carbon, and volatile matter content, the controlling factors being the fixed carbon and the volatile matter. On this basis the coals commonly designated as bituminous are ranked, in descending scale, as bituminous, subbituminous, and lignite. Each rank includes two or more subclasses. The border lines between the several ranks are not clear-cut. Chemical analysis reveals differences in coals that affect their burning characteristics—important variations with respect to such factors as the moisture, sulphur, ash, phosphorous, fixed carbon, and volatile matter content as well as heat value and fusibility of ash. Other characteristics of coals that affect their suitability for certain uses and are not yet subject to exact measurement include friability, grindability, and free burning, coking, and caking qualities.

Coals are commonly classified—on the basis of volatile matter contained—into low, medium, and high volatile. There is a wide difference of opinion among bituminous operators as to where the lines should be drawn. The most authoritative definition is contained in the tentative specifications for classification of coals by rank adopted by the American Society for Testing Materials on the recommendation of a committee of the American Standards Association: low volatile, more than 14 but not more than 22 per cent; medium volatile, more than 22 but not more than 31 per cent; and high volatile, more than 31 per cent. The volatile contents are on a dry basis.¹ Within any one grade as

¹ Proceedings of the 39th Annual Meeting, Vol. 36, 1936, Part I, p. 813.

well as between grades there are gradations in chemical and physical characteristics and therefore in quality that determine both the suitability of coals for various uses and the prices they can command in competitive markets.

In the commercial market, coal is classified primarily on the basis of the 'use' to which it is to be 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. Size is another factor that enters into the use classification. The variety of commercial sizes is surprisingly large, depending upon the size and shape of the screen openings in use and the consumer's needs or preferences. The broad classes, in order of size, are lump or block, egg, nut, and slack or screenings. A single mine may produce and sell forty or more sizes as the result of mixing in varying proportions and combinations two or more of the primary sizes. Coal not screened is termed 'mine run'.

The above analysis makes it clear that there are many kinds of bituminous coals and that these coals differ in chemical composition, physical structure, burning characteristics, and as a result in the uses to which they may be put. These differences in bituminous coals are found not only between seams, but also in different beds of the same seam and not infrequently at the same mine. Differences in rank, variations within any one rank or grade due to delicate gradations in quality, and the specifications of consumers with respect to quality, size, and quantity all serve to create an intricate price structure which does not easily lend itself to economic analysis.

C CONSUMERS OF BITUMINOUS COAL

Few industrial commodities have so diverse a market or are so widely consumed as bituminous coal. Notwithstanding substantial economies in coal utilization as well as a considerable displacement by competing fuels, bituminous coal continues to be the principal source of total mechanical

energy in the United States. In 1929, a year of peak industrial activity, the railroads were the largest single group of consumers, accounting for approximately 26 per cent of total consumption exclusive of exports. General manufacturing industries, next in importance, purchased about 18 per cent. The coke ovens consumed approximately 17 per cent, the electric utilities 8.6 per cent, the steel works (not included in 'general manufacturing' above), including also iron blast furnaces and rolling mills, $4\frac{1}{2}$ per cent, the bunker trade $11\frac{1}{2}$ per cent, and household and other buyers about 24 per cent. Approximately 75 per cent of the primary energy used in manufacturing industries in 1929 was supplied by bituminous coal, and 75 per cent of the energy used by public utilities in 1934, and 83 per cent of that used by railroads for locomotive power in 1933 came from bituminous coal.²

In 1929 eighty-five of the 3,000 odd counties in the United States consumed about 72 per cent of the coal used in general manufacturing establishments, iron and steel mills, gas plants, railroad shops, and coke ovens.³ About 93 per cent of this coal was consumed east of the Mississippi River. Two states, Pennsylvania and Ohio, used 38 per cent, and all the states north of the Ohio and Potomac Rivers and east of the Mississippi about 80 per cent. The 519,555,000 tons of bituminous coal consumed in that year were distributed to at least 90,000 carload lot buyers and to millions of household and small industrial consumers. Every state in the union used bituminous coal in generating energy for the production of light, heat, and power.

D DISTRIBUTION OF BITUMINOUS COAL

Bituminous coal is distributed through several channels. The simplest and most direct marketing arrangement occurs in the case of captive tonnage, i.e., coal shipped by mines to affiliated, controlling, or owning corporations.

² Carter vs. Carter, In Equity No. 59374, pp. 19 and 20.

³ These consumption figures do not include coal used by railroads for locomotive fuel and coal consumed by electric utilities, the bunker trade, coal mines, other mines and quarries, and household and miscellaneous users.

From 20 to 25 per cent of total tonnage is handled in this way. The rest of the coal is sold either by the sales departments of operating companies or by separately incorporated sales agents, by independent wholesalers, by dock companies (which combine wholesaling in carload lots with retailing), and by retailers. In general, the large companies maintain their own sales departments and the small companies sell through independent wholesalers or jobbers. Retailers, who handle from 15 to 20 per cent of total production, purchase their coal from the mine or the wholesaler, and, in the Northwest, from the dock companies. Very little is known concerning the amount of coal handled by each type of distributor, their methods, or the cost of their services.

Bituminous coal "flows from its many producing fields by a maze of hauls and crosshauls to meet in competition for the markets of the country". In 1929 only about one-fourth of total shipments of bituminous coal were intrastate. The rest of the coal, except that used as railway and bunker fuel, moved across state lines to compete with coal from other areas and with other sources of heat and power in the domestic fuel markets. Not a single coal producing state supplied its entire coal requirements. A fairly representative city, Indianapolis, obtained 53 per cent of its all-rail coal deliveries from Indiana mines and its other shipments from mines in 25 districts in 8 other states.⁴

Producing fields are so widely scattered geographically and so numerous, coals vary so markedly in their composition, and freight rates are so high in proportion to the price of coal that the market areas to which various fields may ship coal tend to be limited. Consequently, there are many regional markets, each served at any one time by its own combination of producing fields. The flow of coal from producing fields to various markets, however, does not follow crystallized channels. Minor adjustments in mine prices or freight rates may greatly modify the movements.

⁴ F. E. Berquist and Associates, *Economic Survey of the Bituminous Coal Industry under Free Competition and Code Regulation* (National Recovery Administration, Division of Review, March 1936), p. 140.

E THE PRICE STRUCTURE

In the bituminous coal industry there are no 'administered' prices,⁵ unless we so regard the nominal charges (many of which are merely book values) that captive mines record for shipments to owning or affiliated companies. If these may be called administered prices, then approximately one-fifth of total production falls in this category. Prices of the rest are determined under extremely competitive conditions.

In the marketing of bituminous coal we find three types of price: (1) mine prices, f.o.b. cars, which in captive tonnage may be book transactions or arbitrary prices; (2) the prices reported for commercial coal f.o.b. cars on the track at destination, f.o.b. piers, f.a.s. ship, and at docks; (3) retail prices, which include the f.o.b. mine price, transportation charges, and the retailers' margin. The price charged by the wholesaler is an f.o.b. mine price which includes his margin.

Because of the downward trend of prices from 1923 to 1932 and the substantial shifts in the flow of coal from producing fields to consuming markets, the price structure in this industry has been extraordinarily flexible. At any one time there are literally thousands of coal prices. The innumerable price variations may be explained to a considerable extent by the following factors, some of which have been considered above. Differences in:

- a) the rank or grade of coal
- b) size specifications
- c) the uses to which coal may be put
- d) the preparation given the coal
- e) the competitive situation within market areas. The price charged at the mine on a given day for a given size frequently varies for different markets. To illustrate, the minimum price for lump coal, 4 inch and over, asked by group A mines in the Clearfield district of Central Pennsylvania on January 1,

⁵ Gardiner Means has defined an administered price as one set by administrative action and held constant for a period of time. For scientific purposes there is some doubt as to the value of this concept.

1935 was \$2.50 per ton for coal sold to market areas 1 and 1a, \$2.90 for coal shipped to market areas 2 and 3, and \$2.85 for other market areas. The prices for all classes of mines in the Clearfield district to market areas 1 and 1a ranged from \$2.20 to \$2.50 per ton, and those to market areas 3 and 4 from \$2.65 to \$2.90.⁶ Variations of this kind are characteristic of the industry and are occasioned by differences in freight rates, partial absorption of freight rates by operators, location, transportation facilities, the competitive situation in the markets supplied, costs of production, and similar factors.

- f) the period covered by the sales contract. Sales of coal in car-load lots are divided into contract sales and spot sales. The basis of classification is the time that elapses between the date of sale and the date of final delivery, sales requiring delivery within 30 days usually being designated as spot sales.
- g) the quantity purchased
- h) seasonal fluctuations
- i) the bargaining position of consumers

The trends and differentials in the prices charged for coals of different grades and ranks, and for different uses, market areas, types of consumer, etc., have not as yet been analyzed. This is one of the 'blind spots' that is especially in need of study and research.

The difficulties inherent in securing satisfactory reports on coal prices, the inadequacy of present methods of collecting price data, and the need for improving current information on prices are recognized as fundamental problems by those who publish prices of coal. The following quotations are typical of statements made to the Committee during the course of its work:

"We are having considerable difficulty with bituminous coal prices."

"Our experience indicates that coal is one of the most difficult commodities for which to get uniform and reliable price quotations."

⁶ The mine groups and market areas refer to the classifications established by the Code Authorities under the Bituminous Coal Code for the purpose of setting minimum prices.

"At present, and for some months back, we have been quoting only coal prices at Chicago for the reason the markets elsewhere have been peculiarly difficult to quote. For that matter, Chicago is no exception, but we seem to have been able to get a better coverage there."

F FACTORS THAT DETERMINE PRICE LEVELS AND PRICING POLICIES

The factors and conditions that affect prices may be grouped as those which are primarily common to the industry at large and influence the average level of coal prices, and those which vary from field to field and determine the prices a given operation may command. Such a classification is more or less arbitrary. Obviously both the level of prices in the industry and a given mine price are interrelated and are determined by both industry-wide and local or regional forces and conditions. It is believed, however, that this form of presentation will help to clarify the price problems that characterize the industry.

CHARACTERISTICS OF THE INDUSTRY THAT AFFECT THE AVERAGE LEVEL OF COAL PRICES

In this analysis the several factors are grouped according to their major influence upon capacity and production costs or selling prices and demand. These aspects of price determination interact, of course, and therefore alter the component forces that affect each.

Factors influencing Capacity and Production Costs

Certain factors and conditions are continuously exerting pressure on the owners of coal land to increase existing capacity and on the operators to produce coal. The more important are:

Abundance and accessibility of coal deposits

This country is well supplied with bituminous coal deposits. They and the relative ease with which mines may be opened or reopened are ever-present inducements to the

owners of coal lands to begin production at the first propitious opportunity.

Cost of holding undeveloped coal lands

A very large portion of our undeveloped coal resources that are mineable at current price levels are in the hands of mining companies and individuals. Taxes as well as interest charges and, in some cases, the cost of supervision are continually recurring items of expense. Since there is no revenue until coal is marketed, these resources tend to be developed as soon as a favorable opportunity presents itself. Often this means a price that gives only a small return above production costs and carrying charges on outlays for development.

Decentralization of the industry

Coal is mined commercially by more than 6,000 mines scattered over thirty odd states. In 1929 these 6,000 odd mines were operated by some 4,000 companies. These figures, however, overstate the degree of decentralization, since four states (Pennsylvania, West Virginia, Kentucky, and Illinois) produce more than 70 per cent of coal mined annually. This wide geographic distribution of mines serves to preclude voluntary concerted action on the part of producers to balance capacity with demand or to establish any semblance of control over prices.

Highly specialized character of the industry's capital equipment

Mining equipment cannot be used for other purposes, the costs of development cannot be recovered except by producing coal, and overhead and maintenance costs go on when the mine is closed. In the absence of any regulation of either capacity or price, mining is continued until not even the out-of-pocket costs are forthcoming. Should this practice lead to bankruptcy, the mine is often operated under new management with greatly reduced capital charges and is thus able to sell at still lower prices; this aggravates fur-

ther the economic position of other existing commercial operations. The ordinary adjustment of capacity to current demand by means of price changes is thereby hampered.

Time required to develop new mining properties

The process of opening up a new mine takes time, three years or even longer being required to bring a new mine up to its maximum rate of production. Once started, the undertaking is usually completed, and as a result additional capacity is frequently brought into being several years after demand has been curtailed. How this factor affects capacity "is well illustrated by the growth of mine capacity during the war period. The normal annual 'birth rate' before the war was about 300 new mines of commercial size. In their first year of production these mines would turn out perhaps 8 million tons of coal, but by the third year of their life the same mines would be turning out 18 or 20 million tons. Now, as soon as the price shot up in 1916 the 'birth rate' greatly increased. In that year 454 new commercial mines were opened, and in 1918 the number jumped to 1,573. . . . The first-year output of the new mines opened in 1918 was 24 million tons, and their mature output was probably well over 50 million tons. The figures of new and abandoned mines show that the properties opened in the three years 1916 to 1918 so far exceeded those abandoned during the same time as to add at least 150 million tons to the annual capacity of an already overdeveloped industry. But these increments in capacity did not greatly affect the market until the high price of the war had gone, partly because of the time required to bring new mines to maturity and partly because when they were projected there was no surplus of labor to man them. In fact, much of the new capacity came into mature productivity in the depression year 1921, during which the producing power of the industry increased by 64 million tons."¹

¹ D. L. Wing and F. G. Tryon, *The Bituminous Coal Industry in Prosperity and Depression*; a paper presented before the mining session of the American Statistical Association, December 28, 1923.

Complicated structure of freight rates

Under natural conditions the more distant producing fields would have a haulage cost that would be a heavy liability except where the coal is of exceptional quality or the burden can be shifted to the wage earners in the form of lower wages and longer hours. This disadvantage is offset in part by an intricate structure of freight rates which, by reflecting factors other than differences in distance of haul, encourages the development of outlying coal resources. By lower ton-mile rates for long hauls and by the extension of railway facilities to new coal lands, the railroads have made it possible for coal from remote fields to compete in the nearby markets of the older fields. Thus the railroads have contributed materially to the overdevelopment that has characterized this industry throughout much of its history. Because freight charges constitute such a large portion of the consumer's purchase price and because competition is based upon the delivered price, freight rates play an extremely important part in determining the prices, f.o.b. the mine, for certain markets.

Increase in mechanization

Since 1920 extraordinary progress has been made in the mechanization of mines, in preparing coal for the market, and in methods of storage. Limitation of space prevents consideration of the extent and nature of the progress in the field of engineering. Some idea of these advances may be obtained from the increase in output per employee. For the industry as a whole the average output per man per day rose 32.5 per cent between 1920 and 1931—from 4.0 to 5.3 tons. Employee output has since declined, particularly in 1934 when the reduction in daily hours of work from eight to seven caused output per day to fall to 4.4 tons. The following year daily output increased to 4.5 tons.

Joint costs

While a considerable amount of coal is sold as a mine-run product, most of it is screened into numerous sizes to meet

the requirements or preferences of consumers. As no size can be produced without a resultant (i.e., by-product coal of other size or sizes in addition to the principal product), costs cannot be definitely allocated. Preparation practices aggravate the supply problem in that the resultant of one group of mines may be the primary size of other mines. The attempt to unload the resultant affects materially the market of the producers whose major output happens to be similar to the resultant of other mines. This condition affects the supply of certain sizes of coal and therefore the price they can command in the market at a given time. Adjustments are difficult because the combination of sizes demanded is not constant throughout the year.

Other Factors Influencing Selling Prices and Demand

Demand for bituminous coal, which prior to 1919 moved steadily upward, except for fluctuations with the business cycle, has in recent years fallen below the 1920-23 average. The basic forces and conditions that account for this significant change and that affect the demand for this fuel generally are summarized below:

Character of demand

In the short run, total demand for coal is not likely to be substantially modified by price changes. Power and heat are items in consumption that cannot be dispensed with and shifts to substitute fuels take time. The consumer's coal bill constitutes so small a proportion of his total expenses (usually well under 10 per cent) that there is no strong incentive to change to competing fuels unless the price differentials are greatly altered or the supply of coal is frequently cut off by labor disputes. Furthermore, equipment generally used to burn coal is too costly to discard and in many instances the expense of adapting it to the use of other sources of energy is considerable. In addition, because mine prices constitute approximately one-half of the delivered price to large industrial consumers and from one-fifth to one-fourth of the retail price, only substantial ad-

justments in mine prices materially modify delivered prices. Over a period of years, however, equipment must be replaced. Prolonged high prices, especially when accompanied by periodic general strikes, may cause shifts to other fuels and encourage greater care in firing and improvements in the design of fuel-burning equipment. These may alter appreciably the demand for coal. Post-War developments in this industry have demonstrated that in the long run demand for bituminous coal is surprisingly flexible.

Seasonality

Shipments fluctuate from month to month. For the industry as a whole production drops materially in March or April and continues at a level considerably below the average for the year until August. The active period is from September to January or February and sometimes March. This seasonal pattern of the industry must not be taken as representative of individual companies or fields. The curve of monthly shipments varies from field to field, and those for certain fields, notably the regions supplying the lake trade, differ widely from that of the industry as a whole.

Decline in the rate of growth of important consuming industries

As pointed out by F. G. Tryon, the virtual completion of the railroad net of North America, the shift in manufacturing from crude, heavy products to lighter products requiring less fuel, and the great increase in the volume of secondary metal returned by industry in the form of scrap have definitely retarded the growth of virgin pig iron consumption. As the iron and steel industry has been the second largest single consumer of bituminous coal, these changes helped to check the growth in demand that characterized the coal industry prior to 1919.⁸ In part this decrease in demand has been offset by gradually increasing consumption in some of the processing industries. Undoubtedly, the de-

⁸ *The Trend of Coal Demand* (Ohio State University Press, Columbus, 1929), pp. 6 and 7, and Carter vs. Carter, In Equity No. 59374, pp. 36 and 37.

cline in the rate of growth of population in this country has retarded the former rapid increase in the consumption of heat and power for industrial uses.

Competition of other sources of energy

Competing sources of energy, notably oil, gas, and hydroelectric, listed in the order of importance, have encroached upon the markets of bituminous coal. Of the annual supply of energy obtained from mineral fuels and water power in the United States the percentage contributed by bituminous coal dropped from 69.5 in 1918 to 46.3 in 1934. This does not mean, however, that competing fuels have directly displaced bituminous coal to this extent. Much of the growth in the total energy supply has been due to the extensive utilization of gasoline in motor vehicles and of oil and gas for uses that can be said to be merely in indirect competition with coal. It has been estimated that less than one-fourth of the 1929 consumption of fuel oil and about half of the natural gas consumption entered directly into competition with coal.⁹ Much of the fuel and gas that competes with coal is consumed in the Southwest and Far West.

Economies in the use of coal

The largest single factor accounting for declining demand for bituminous coal is increasing efficiency in the use of fuel. It began in 1909, but its effect upon national demand was not significant until after 1920 when the post-War price level was a strong incentive. The average percentage reduction in fuel consumed per unit of product between 1909 and 1929 as estimated by F. G. Tryon and H. C. Rogers is presented herewith. The authors point out that these savings are due to the cumulative effect of small economies and the general application of improvements and practices developed by the more efficient companies. "The aggregate consumption of fuel and hydro-power in industries and steam transportation at the efficiencies actually attained in 1929 was only 67 per cent of what it would have been had

⁹ Berquist and Associates, *op. cit.*, pp. 25 and 26.

the wasteful practices of 1909 continued unchanged."¹⁰ Data for subsequent years indicate that the movement for fuel economy has continued, but at a much slower pace. Materially decreased rates of reduction are shown in the consumption of coal per unit of product for electric public utilities, blast furnaces, and locomotives in freight service.

INDUSTRY OR SERVICE	PERCENTAGE REDUCTION IN FUEL CONSUMPTION PER UNIT OF PRODUCT 1909-1929
Electric public utility power plants	66
Steam railroads	40
Petroleum refining	36
Iron furnaces, steel works and rollings mills	25
Cement mills	21
All other manufacturing, approximately	21
All industries or services listed above	33

In some instances at least a temporary halt in the progress of efficiency in the use of coal is indicated.¹¹ Consumption of coal per passenger train car-mile by locomotives for passenger service has actually increased because of the reduction in number of passenger cars per train and the increase in speed.

Economies in the use of coal are also being applied to households, by means of insulation, more efficient radiation, automatic heat controls, and improved standards of furnace construction.¹²

This analysis of the factors and conditions that influence the general level of coal prices indicates, and factual studies substantiate the conclusion, that, on the one hand, there is continuous pressure on the owners of coal land to increase existing capacity, and for the operators to continue to sell coal at prices that do not cover production costs, and, on the other hand, a number of forces and conditions are causing a drastic decline in the rate of increase in the demand for bituminous coal.

The working out of these factors over a period of years

¹⁰ *Statistical Studies of Progress in Fuel Efficiency* (Transactions, 2d World Power Conference, Vol. 6, Sec. 12, 1930), pp. 343-65.

¹¹ Shore, Tryon, and Mann, *Minerals Yearbook*, 1935, p. 636.

¹² Berquist and Associates, *op. cit.*, p. 25.

has resulted in idle mines and low utilization of capacity. "From 1900 until the beginning of the World War the percentage of capacity utilized was fairly uniform. Since the World War, demand has been checked at about 500 million tons production, but capacity continued to increase and reached a peak in 1923. Subsequent liquidation of War-time capacity improved somewhat the ratio of use to capacity, but even in 1929 it was not back to the pre-war level. In that year 17 per cent of the capacity of active mines was unutilized, and idle mines would have added another 17 per cent."¹³

The introduction of the seven-hour day and the five-day week in April 1934 has tended to reduce excess capacity. This tendency, however, has been offset at least to some extent by the further introduction of two- or even three-shift operations. It is frequently asserted that overdevelopment has disappeared. However, in 1935 bituminous coal mines worked on an average only 179 days or approximately 71 per cent of a full working year of 252 days.¹⁴ It is a matter of conjecture whether seasonality in this industry requires such a large proportion of inactive capacity. The mere presence of surplus capacity as well as more adequate transportation facilities may have encouraged over a period of years the commercial buyers of bituminous coal to purchase on a hand-to-mouth basis or to reduce to a minimum the stock carried in storage.

CHARACTERISTICS INFLUENCING CERTAIN MINE PRICES

In the preceding analysis attention was centered on characteristics common to the industry at large. This section will examine the forces and conditions that vary from field to field and materially affect the prices a given mine may command.

¹³ *America's Capacity to Produce and America's Capacity to Consume*. A digest of the studies made by the Brookings Institution under a grant from the Maurice and Laura Falk Foundation of Pittsburgh, Pa.

¹⁴ The full working year of 252 days has been computed by taking into account that the wage contract provides for a five-day week and by deduction of the holidays usually designated in the trade agreements.

Factors influencing Production Costs

Minimum Price Area No. 1, established by the Bituminous Coal Conservation Act of 1935, comprises the producing fields of Iowa and of all states east of the Mississippi River except those of Alabama, Georgia, and Southern Tennessee. In 1934 it produced 89 per cent of the total output of the United States. Its production costs per ton of coal mined by commercial operations (Table 2), which do not include

TABLE 2
Production Costs Per Ton of Coal Mined by Commercial Operations in Minimum Price Area No. 1,* 1934

COST ITEMS	DOLLARS PER TON	PERCENTAGE OF TOTAL
Labor		
Daymen	.3784	23.9
Mining	.5264	33.3
Yardage and deadwork	.0560	3.5
Mine supervisory and clerical	.0710	4.5
Total labor cost	1.0319	65.2
Supplies		
All supplies except power and fuel	.1760	11.1
Power purchased	.0670	4.3
Mine fuel	.0097	0.6
Total mine supplies	.2527	16.0
Other Production Costs		
Salaries and expenses	.0213	1.4
Taxes	.0229	1.5
Insurance	.0073	0.4
Depreciation	.0891	5.6
Royalties	.0523	3.3
Compensation insurance	.0486	3.1
Depletion	.0421	2.6
Company house expense (less income)	-.0023	-0.1
Mine office, code authority, and operators association dues	.0167	1.1
Unassigned credit	-.0018	-0.1
Total other production costs	.2962	18.8
Total Production Costs	1.5808	100.0

*Compiled by the Industrial Research Department, University of Pennsylvania, from *Bituminous Coal Code Statistics, 1933 to 1935* (Division of Research and Planning, NRA). Minimum Price Area No. 1 comprises the coal fields of Iowa and of all states east of the Mississippi River except those of Alabama, Georgia, and Southern Tennessee.

selling costs, administrative expenses, interest on investments, and most taxes, disclose the importance of labor costs in this industry. Approximately two-thirds of production costs were paid out in wages and salaries; 60.7 per cent were paid to workers other than supervisory and clerical employees. The cost of supplies amounted to 16 per cent, of which 70 per cent was for supplies other than power and fuel. Of the other production costs, which accounted for about 19 per cent of total production costs, 62 per cent was set aside for depreciation, royalties, and depletion.

Average costs for so large an area conceal the great variations in costs from district to district and field to field, as is shown by Table 3. Not only are there marked differences in the important cost items among districts but also among the component fields of a given district.

The factors that account for these variations are:

Geological factors and conditions

Natural conditions such as the thickness, pitch, faults, and irregularities of the seam, purity of the coal (that is, freedom from such foreign bodies as slate, sulphur balls, and flinty nodules), roof and floor conditions, drainage, relative hardness of coal are major determinants of cost. These conditions, when they deviate from the optimum, adversely affect output per man per day, labor and supply costs, and the economic use of machine loading.

Degree of mechanization

Companies that can introduce mechanical loading and otherwise mechanize the mining processes are able to increase output per man per day and to lower their labor cost. As pointed out above, the economic use of mechanical loading is limited by seam conditions.

Differences in the rates of pay and the proportion of wage earners employed in different occupational groups

Standard wage rates are not in effect throughout the industry. The rates of piece workers usually vary from district to

TABLE 3

Labor, Supply, and Other Production Costs of Commercial Mines, Selected Coal Fields, 1934*

DISTRICT	LABOR COSTS		SUPPLY COSTS		OTHER PRODUCTION COSTS	
	Avg. for district	Range for component fields	Avg. for district	Range for component fields	Avg. for district	Range for component fields
Eastern Pennsylvania	\$1.22	\$1.13—1.52	\$.301	\$.266—449	\$.305	\$.252—.381
Maryland—Upper Potomac	1.25	1.25—1.26	.235	.225—.248	.277	.238—.307
Western Pennsylvania	1.14	1.00—1.30	.241	.173—.292	.359	.224—.515
Ohio	1.09	1.05—1.22	.219	.209—.270	.260	.224—.307
Northern West Virginia	.93	.89—1.23	.187	.171—.260	.257	.208—.394
Southern Subdivision No. 1	1.09	1.02—1.20	.260	.243—.281	.327	.300—.349
Southern Subdivision No. 2	1.03	.78—1.21	.231	.196—.266	.290	.245—.352
Alabama	1.33	1.18—1.89	.366	.330—.575	.317	.288—.343

* Compiled by the Industrial Research Department, University of Pennsylvania, from *Bituminous Coal Code Statistics 1933 to 1935* (Division of Research and Planning, NRA).

district, among the fields within a given district, and sometimes at a given mine. Even the rates of the men who are paid by the day are not standard throughout the industry. Important differentials in day rates prevail not only between the North and the South but also between groups of fields in both the northern and southern areas and between the districts or groups of fields in the East, the Middle West, and the Far West. The division of work between mining, cutting, and loading employees and the day men also varies by districts. These differences may influence labor costs.

Differences in operating time per month

Per ton production costs for coal rise with great rapidity as the number of tipples starts approaches zero, because the cost items on a fixed lump-sum basis, as well as Sunday and holiday costs and idle-day labor and supply costs, constitute a growing proportion of total per ton costs as the number of days worked during a given period falls. Tipple time fluctuates from month to month and varies by districts, fields, and mines. The differences may be accounted for by the factors that affect the demand for particular coals at given prices and by loss of time due to accidents at the mine, car shortage, lack of sufficient labor, and strikes or lock-outs.

Miscellaneous factors

Other factors also influence production and total costs:

Type of mining, i.e., whether shaft, drift, slope, or surface
Age of mine and character of mining, i.e., whether mining on the advance or the retreat, or robbing pillars

Variations in payments for royalties, in the amounts set aside for depletion and depreciation and in salaries paid to executives and officials

Differences in the amount of preparation given to the coal

Efficiency of labor

Efficiency of management

Degree of obsolescence of mining equipment

Depth of mine

Rate of employee compensation insurance

State and local taxes

Amount of reserve acreage

Factors influencing Selling Prices and Demand

Some of the forces and conditions that determine whether a given operator can sell his products in competition with other producers and other sources of energy are:

Quality of the coal

As pointed out in Section B, coals differ in chemical composition, physical structure, burning characteristics, and as a result in the uses to which they may be put. This factor is of especial importance.

Location of the mine

Location is closely related to freight differentials which determine accessibility to coal markets. Coals produced in outlying fields away from the large consuming markets are at a disadvantage unless offsetting factors are present. Mines with access to several railroads or to both rail and water or ocean transportation are in a more advantageous position.

Competitive situations in the markets supplied

Some markets and market areas obtain coal from many fields. Moreover, all markets are not affected to the same extent by inroads of competing sources of energy and by economies in the use of coal.

Changes in the sizes of coal demanded

These changes affect certain fields whose coal is not sufficiently firm in structure to make screening profitable because of degradation resulting from handling. As a result, mines in these fields cannot take advantage of the market for household sizes.

Types of consumer

Household buyers pay higher prices and their purchases are less affected by depressions than are those of most other buyers of coal. Even among the carload lot buyers one would expect considerable variation in the response of purchases to the ebb and flow of business cycles. Certainly the amount of coal sold to public utilities would be less affected by a depression than that sold to manufacturing establishments.

Changes in the freight rate structure

The present complicated structure of freight rates on bituminous coal is the result of frequent adjustments to meet changing conditions in the industry over many decades. The extension of railway facilities to new fields far from the important consuming markets led to the establishment of lower ton-mile rates for long hauls, which made it possible for some of the outlying fields, notably those in Southern West Virginia, Eastern Kentucky, and Southern Illinois to encroach on the important coal markets formerly supplied by the older and more strategically located fields. The differentials in freight rates that had evolved over many years have been modified from time to time, affecting markedly the competitive position of competing fields. It is because minor adjustments in these rates may give rise to important modifications in the movement of coal that changes in the freight rate structure are so important to those whose livelihood depends on the mining of coal.

Competing forms of transportation

Competing forms of transportation also affect the price structure and the movement of coal from producing fields to markets. An outstanding example is the increase in the movement of southern coals to New York and New England via Hampton Roads and coastwise barges and the decline in the all-rail movement from Central Pennsylvania to these same markets. Since 1929 the trucking of coal has gained substantially. Although in 1934 only 5.4 per cent of

the total coal landed at the mines for shipment was handled by trucks, the continued growth of this form of transportation may essentially influence the ability of competing fields to sell in important consuming markets.

The preceding analysis suggests the complexity of the problems with which a program of research must deal. In addition to the natural conditions, most of which vary from field to field and materially influence the cost of production, there are economic forces, many of which are more or less common to all coal fields but vary markedly in duration, degree, and intensity. This combination of factors has created intense competition and has led to ruinous price-cutting except during periods of shortages or when the industry was subject to governmental control. This situation has been further aggravated by a high and even increasing degree of seasonality. During many years the industry has been characterized by idle mines, idle men, and low returns to wage earners, producers, and investors. And the consumer has not derived the degree of benefit that it is generally believed he obtains from free competition, since mine prices are only about half of the delivered price to large industrial consumers and from one-fifth to one-fourth of the retail price.

The forces and conditions described above have not, of course, had the same effect on all fields and areas. On the contrary, certain areas have improved their position relatively, and, during many years, absolutely. Consequently, research, to be effective, should concern itself at the outset primarily with major producing and marketing regions and with specific functions and aspects of production, distribution, and consumption, rather than with the industry as a whole.

PART TWO

Program of Research

NEED AND OPPORTUNITY FOR RESEARCH IN BITUMINOUS COAL

VIRTUAL disorganization has characterized the bituminous coal industry for well over a decade. In the face of this disturbing situation, as well as of the legal restraints imposed by the Sherman Anti-Trust Law, it has been impracticable for the industry to eliminate uneconomic practices and to adjust effectively the volume and rate of production to market requirements. The general recognition of this truth is evidenced by the passage of the Bituminous Coal Conservation Act of 1935 and the Bituminous Coal Act of 1937.

Since Congress has decided that regulation of the bituminous coal industry is essential to public welfare, research is imperative to provide guidance to those responsible for legislating and administering the principles and bases for control. Employers who must make day-to-day decisions of policy and procedure will find accurate data and interpretations of no less value.

For the economist, research in this industry should be especially fruitful. Throughout much of its history it has approached to an extraordinary degree the state of free competition—one of the basic postulates of the capitalistic system. Moreover, there are available or can be made available with reasonable expenditures for assembly and compilation, surprisingly comprehensive and, on the whole,

reliable series of quantitative data and other factual information. Especially profitable for exploration would be the period beginning with 1912, since it covers the two fairly normal pre-War years, the depression of 1914, the prosperity preceding our entrance into the War, the extraordinary expansion occasioned by the War and by the high prices that resulted from an unprecedented demand, inadequate transportation facilities, and labor controversies, the readjustments of 1921-22, the painful liquidation subsequent to 1923, the prolonged depression beginning in the autumn of 1929, and the industry's attempts with governmental sanction and assistance to stabilize conditions under the NIRA and under more recent legislation. During this quarter of a century the industry has experienced 'normalcy', periods of shortages, price control under the Lever Act, labor controversies, extensive over-development, drastic liquidation, and governmental regulation. An integrated program of research covering these eventful years should provide economists not only with illustrative material but also with a better understanding of the operation of an important natural resource industry subject to violently changing conditions.

THE COMMITTEE'S OBJECTIVES IN DEVELOPING ITS RESEARCH PROJECTS

The study of an industry may take many forms. The Conference on Price Research, for which this project has been prepared, has suggested that emphasis be placed on price research. From the standpoint of economic theory this is the logical approach, since pricing policies and price trends are of paramount importance in American economic life, regulating the flow of production and the utilization of the agents of production and affecting the well-being of investors, producers, employees, and consumers. It is also a wise choice from the point of view of the producers because price trends throw light on the effectiveness of the organization of the industry and because a study of the behavior of prices focuses attention on the forces and conditions that

determine supply and demand, thus centering research efforts on the basic problems of production, distribution, and consumption.

It is recognized that price research is but a point of attack, not an end in itself. The end desired may vary with the interests of those undertaking research and the nature and organization of the industry concerned.

For bituminous coal, it is believed the general objectives of the Conference on Price Research may best be attained by a coordinated program of research that will describe realistically the structure, organization, and functioning of the industry in production and distribution, and that will examine the effects of basic industrial and economic changes on the costs and prices of bituminous coal. Further, the program should deal with the influence of price and other factors on the production, capacity, working time, and employment of competing coal fields, the flow of coal to various markets, the consumption of bituminous coal in important markets, the shifts in consumers' buying habits and their preferences for particular sizes and kinds of coal, the increasing economies in use, and the displacement of bituminous coal by competing fuels.

PROGRAM OF STUDIES

This series of related studies has been developed after a careful examination of the price and other data available for research; the present knowledge of the organization and functioning of the industry, and the problems that are of major significance at this time and are in immediate need of research. The Committee believes that the program in its entirety represents a coordinated scheme of research, each specific project either having a bearing on some of the other studies or contributing to the appraisal of the functioning of the industry as a whole. The program has been outlined in terms of separate projects so that the Conference on Price Research may allocate parts of the program to individuals and organizations wherever this seems advisable.

Three distinct types of project are recommended:

- A Regional studies in production, and in distribution and consumption
 - 1 Studies of major producing fields
 - 2 Studies of important market areas
- B Studies of special functions or aspects of the industry
 - 1 Price structure and pricing policies
 - 2 The flow of capital into and out of the industry
 - 3 The bituminous coal industry under governmental regulation
 - 4 Distribution channels and the flow of coal to consuming markets
 - 5 Consumption of coal by use in important markets and areas
 - 6 Economies in the use of coals
 - 7 Changes in sources of energy utilized in the United States with reference to competition faced by bituminous coal
- C Studies dealing with the development and improvement of the factual record of the industry
 - 1 Development of price series
 - a Series of f.o.b. mine prices by producing areas and destination prices by markets
 - b Series of retail prices by markets
 - 2 Preparation of source books
 - a Costs, sales realization, and margins
 - b Other related data including production, employment, employee output, mechanization, etc.

The Committee recommends at least two summary studies to be undertaken when the research projects suggested above have been completed. The first would bring together the results of the individual studies of important market areas and would deal with the broader aspects of the marketing and distribution of bituminous coal. The second would integrate the data and conclusions of all the studies and would discuss and interpret the economic problems of the industry as a whole. Detailed outlines of these

interpretative studies can best be prepared after the completion of the suggested program of research.

The Committee recognizes that many other aspects of the bituminous coal industry need examination. It regrets that the lack of price, production, and distribution data by grade, size, and field or market precludes at this time the inclusion of certain projects, such as the analysis of demand curves of bituminous coal, which deal with certain price problems of traditional concern to economists. It hopes, however, that, after the specific projects have been completed and the various series of data relating to the industry are improved in accordance with its recommendations and with the further suggestions that will grow out of the work on the projects submitted, such studies will be undertaken.

A REGIONAL STUDIES IN PRODUCTION, AND IN DISTRIBUTION AND CONSUMPTION

Two groups of projects fall under this heading: one is primarily concerned with the problems of the producer; the other with those of the distributor and the consumer. Both are studies of selected geographical areas and are designed to deal with the total situation in a particular field or market, that is, with the analysis and appraisal of the structure and functioning of the agencies engaged in rendering the services involved in production or distribution. In both groups of projects examination of the factors and conditions directly related to the supply and demand for bituminous coal, the procedures and problems incident to price determination, and the effects of competition and price behavior on the decisions of those concerned with the production or marketing of bituminous coal are emphasized.

1 Studies of Major Producing Fields

In projects dealing with price and related problems the ordinary approach to the study of producing fields would be from the standpoint of the demand and supply of coal, price behavior, the economic position of the selected field

relative to the fields with which it is in competition, and the economic status of investors, producers, employees, and consumers. Such a study is not possible at this time because of the lack of accurate price data by size, grade, use, and market.

The approach here suggested is to study the economic position of a given producing field in relation to the fields with which it is and has been in direct competition. Not only the present competitive relationships but also the shifts since 1923, preferably during the last 25 years, would be examined. One of the outstanding characteristics of bituminous coal has been the uneven growth or decline in the rate of production of the component fields. Since 1912 certain producing fields, especially those in Southern West Virginia, Eastern Kentucky, and Virginia, have substantially increased their share of total production, while others, notably those in Eastern and Western Pennsylvania, Maryland, and Ohio, have taken heavy losses. The rate of increase or decrease has varied from field to field.

Outline of project and procedure

Why have certain fields outstripped their competitors in the struggle for markets and what conditions make it possible for them to hold a competitive advantage today? To answer this question it is necessary to analyze the natural conditions in the fields, the economic factors at work, and the artificial barriers that interfered with the flow of coal to markets. The fields suggested for study are Eastern Pennsylvania, Western Pennsylvania, Ohio, Northern West Virginia, Maryland-Upper Potomac, Southern No. 1, Southern No. 2, Indiana, Illinois, Western Kentucky, and Alabama-Southern Tennessee-Georgia.

To determine the economic position of each field relative to the fields with which it competes, the following criteria are suggested:

The degree to which each field has been able to maintain the production level of the base period

The proportion contributed by each field to the total coal

produced by the group of fields under examination in each of the years studied

The degree to which each field was able to maintain the total sales realization level of the base period

The proportion, received by each field, of the combined sales realization of the group of fields under examination in each of the years studied

Operators' margins per net ton during 1917, 1918, 1921, 1922, and November 1933 to January 1935

The prevailing economic positions of the fields as well as the shifts during the period once determined, the same criteria should be applied to the districts or seam groups that compose the field in order to ascertain whether the decline or improvement has been restricted to a few districts or is common to all. It would be important to ascertain whether the changes in production, total value, and margins were due to special local conditions such as the working out of old seams or the opening up of new ones, or to shifts, if any, in the uses of coal or in the regional markets supplied by the several districts and by the field as a whole.

Because the factors that determine the ability of a field to produce and sell coal are reflected in either the per ton costs of production or sales income, it is suggested that the per ton expenses and receipts of the fields be analyzed in detail for the years for which data are available, namely, 1916, 1917, 1918, 1920, 1921, 1922, and especially the 15 months beginning November 1933.

With respect to mine costs, the analysis for November 1933 to January 1935, inclusive, would involve a comparative study of the per ton labor costs, supply costs, depreciation, depletion, royalties, salaries, taxes, compensation insurance, company house expense, as well as production, administrative, and selling expenses. For other years, because the data are less comprehensive, the comparison would have to be restricted to labor and supply costs, general expenses, and total costs. Once the differences that have prevailed among the fields have been established, the factors and conditions that account for them should be studied.

This will necessitate an examination of the variations among fields with respect to: (1) wage levels; (2) employee output, which in turn is materially influenced by: (a) thickness of seam, (b) other seam conditions, such as pitch, character of top and bottom, relative hardness of coal, faults; (c) degree of mechanization; (3) type of mining; (4) depth of mine; (5) number of days the mine tipples operated; (6) size of mine; (7) excess capacity; (8) various sizes of coal produced; (9) preparation given the coal; (10) obsolescence of mining equipment, etc. So far as possible each factor should be subjected to statistical analysis.

For other factors affecting prices the examination would attempt to evaluate differences in: (1) qualities of coal, including chemical, burning, and physical characteristics; (2) accessibility to markets as determined by freight rates and location; (3) competitive situation in the markets supplied; (4) shifts in specifications and sizes; (5) uses to which coal is adapted; (6) channels of distribution; (7) size of sales orders; (8) pricing policies, especially in spot and contract sales; (9) transportation facilities available, etc.

Such a study would disclose not only the difficulties that operators face but also how the many factors that influence the supply and demand for coal, and therefore prices, vary from field to field in number, intensity, and duration. The background and data thus supplied would be of immeasurable value in interpreting the detailed price data, the compilation of which is recommended in Section B, 1.

Sources of data

The basic data available include:

- 1) Flow of coal from producing fields to consuming states for 1917, 1918, and 1929 (see pp. 61, 114, 115)
- 2) Flow of coal to specific market areas (see pp. 61, 115)
- 3) Consumption of coal by uses (see pp. 61, 63, 114)
- 4) Channels of distribution (see pp. 59, 60)
- 5) Costs of production, sales realization, and margins (see pp. 94-106)
- 6) Wage rates

Data on wage rates are incomplete. For the union fields they may be obtained from the wage contracts entered into by operators' associations and the United Mine Workers of America, who maintain a file of these contracts. The Research and Planning Division of the NRA published an analysis of the union rates for selected occupations in its *Economic Survey of the Bituminous Coal Industry Under Free Competition and Code Regulation*.¹ For 1912 to January 1, 1923 wage rates for union and non-union fields were collected and published by the United States Coal Commission of 1923.² These data were summarized and interpreted in *Wage Rates and Working Time in the Bituminous Coal Industry*.³ Since the union failed to negotiate collective agreements with a considerable number of producing fields that had previously dealt with it for varying periods, a continuous series of wage rates is not available except for a few union fields from 1923 to October 2, 1933. For this period the important sources are the biennial surveys of daily and hourly earnings, in some cases wage rates, by states, made by the Bureau of Labor Statistics beginning in 1919 (Table I-8). Complete data for virtually all fields are available subsequent to October 2, 1933 and may be obtained from the Bituminous Coal Code and union contracts.

7) Other data

For many years the Bureau of Mines has published, in many instances by counties, fields, and states, data on production, average value per ton, number of days worked by mines, number of men employed, output per man per day, number of mines, equipment, and methods of mining and preparation (including methods of recovery, undercutting machines, loading machines and conveyors, and mechanical cleaning), stocks of commercial consumers, capacity of

¹ Berquist and Associates, pp. 585-614. The analysis was made by Charlotte E. Warner.

² Part III, pp. 1037-1103, and Part V, Atlas of Statistical Tables, pp. 165-270.

³ Waldo E. Fisher and Anne Bezanson (University of Pennsylvania Press, 1932).

mines, number of days idle, and similar factors. In some instances additional information by mines is available in the published reports of the various state bureaus or departments of mines. Data on thickness of seam were compiled by the Geological Survey during certain War years and by M. H. Schoenfeld and F. G. Tryon for 1920. The NRA collected this information for 1933 and 1934. Additional data may be obtained from the reports of state bureaus and the *Keystone Coal Catalogue*. Data on the qualities of coal have been compiled by the Geological Survey, the Bureau of Mines, various state geological agencies, as well as by several private organizations. Many of these data by coal fields have been assembled and published in *Black's Directory*.

If each of the proposed regional studies is to be conducted by a university or other research agency in or near the producing field, and if several studies are started at about the same time, it is suggested that a coordinating committee be formed. Moreover, each field study should have its own advisory committee on which members from the industry and the government who are well acquainted with the technical phases of the production and marketing of coal should be included.

2 Studies of Important Market Areas

The bituminous coal industry is harassed by many marketing problems. Who supplies the coal consumed in certain areas? Who uses coal? To what extent has the use of coal been decreased by the substitution of fuel oil, natural gas, and other fuels? How are prices determined? What factors explain why a ton of coal costs certain consumers five times the amount received by the mine operator?

The answers to these and other questions are of major importance to everyone engaged in the mining of bituminous coal, especially employees, employers, and investors. Many other groups are also concerned: distributors, competitors, and the industrial and household consumers who ultimately 'foot the bill'. In addition, those economists who are interested in making their theories fit reality need to know the

facts that can be brought out by carefully planned research.

Industry-wide studies, however, cannot provide complete answers, for each market may differ from other markets in at least four respects:

1) Sources of coal used in the market

Even though coal is consumed in every state, it does not have a national market: since freight rates are high relative to the mine price, the output from any mine can be sold only in certain markets. As a corollary, it is obvious that any market may differ from other markets with respect to the fields from which it secures coal.

2) Relative importance of different classes of users

At present relatively little is known as to the exact importance of various users of coal. It is expected that the regional production as well as the consumption and distribution studies will secure data bearing on this question, but it is a safe assumption, for example, that relatively more bituminous coal is used for heating houses in Minneapolis than in Philadelphia. In addition, certain markets have classes of users not found in all the other areas.

3) Competition between bituminous coal and other fuels
Little is known at present concerning the extent to which bituminous coal has been supplanted by other fuels in specific localities. The effect of this competition must be studied at the point of impact—the market.

4) Market organization

The same channels of distribution are not used to the same extent in all markets. To illustrate, only certain markets, especially the lake ports and New England, use docks.

Because every coal operator is *directly* affected by conditions in only a few markets and because each market shows significant variations from every other market, it is proposed that a detailed study be made of every important market, including at least: Birmingham, Boston, Chicago, Cincinnati, Cleveland, Detroit, Indianapolis, Kansas City, Mo., Minneapolis-St. Paul, New York, Omaha, Philadelphia, Pittsburgh, and St. Louis.

Outline of project

It is proposed that each of these market studies investigate the problems suggested by the following questions:

- 1) What is the market area? The first task is to ascertain the limits of the market. The only general rule that can be set down at this time is that each study should survey the area commonly served by dealers in the cities named above.
- 2) What is the relative importance of various classes of coal users? What grades and sizes of coal are used by each class? What is the relation between expenditures for coal and other expenditures? In this section it is important to separate at least four classes of consumers: (a) household, (b) apartments, office buildings, hotels, hospitals, etc., (c) industrial carload buyers, (d) government. In addition, industrial carload buyers should be subdivided into: (1) public utilities, (2) manufacturing. If possible, the consumption of coal by each of the leading industries in the area should also be segregated.
- 3) What is the relative importance of the various marketing agencies supplying each class of user? To what extent are they competitive or non-competitive? What are the effects of integration in the production and distribution of coal? In certain areas these studies will make it possible to compare prices of coal delivered direct from the mine to the consumer with the prices charged by dock companies and the cost of all-rail delivery with that of rail-and-water transportation.
- 4) What producing fields supply coal to the market? What proportion of the total does each field supply? The answers to these questions should be in terms of the grades of coal required by each class of user and the grades produced by the different fields that supply the market.
- 5) What is the price structure? How are prices determined at successive stages in distribution? Such questions require an examination of: (a) the bargaining power of the various distributive agencies in relation to that of the classes of consumers they serve, (b) the rate of customer-turnover for

each class of user, (c) the costs, margins, and profits of distributors at successive stages. This section of the study is designed to explain the spread between f.o.b. mine prices and the prices charged to household and industrial consumers. Any intermediate prices would also be examined.

6) To what extent do other fuels compete with bituminous coal? What factors induce consumers to shift to the use of competing fuels? Figures compiled by the Bureau of Mines show that the proportion of the entire production of energy derived from bituminous coal decreased from 69.3 per cent in 1920 to 45.1 per cent (preliminary figure) in 1935 while the share derived from domestic petroleum increased from 12.4 to 27.8 per cent (preliminary figure). This does not mean, however, that competing fuels have directly replaced bituminous coal to this extent. Much of the growth in the total supply of energy has been due to the extensive utilization of gasoline in motor vehicles and of oil and gas for uses in which they can be said to be in merely indirect competition with coal. The total decrease in coal consumption should be analyzed to show the part caused by: (a) improved methods of burning and other economies in its use, (b) changes in the *form* in which it is used—the substitution of electric power generated from coal for steam, shifts from manufacturers' power plants to central stations, and the joint production of manufactured gas and coke from coal—(c) the substitution of other fuels. It will be important to ascertain what effects these changes have had on the demand for specific grades and sizes of coal.

7) What is the seasonality in the demand for coal by each class of user? This analysis should consider not only the effect of weather conditions but also the seasonal patterns of activity in the leading industries in each market.

The answers to these specific questions will give a well-rounded description of the present situation in each market. By comparing the current condition with that of previous periods it will be possible to indicate certain trends in the marketing and consumption of coal in each area. It is desirable that periodic surveys be made in the future to deter-

mine what changes have occurred in each market. Even the first studies, however, should do more than describe the present situation; they should result also in constructive suggestions and point the way through dealer cooperation toward improving methods and channels of distribution and reducing costs of marketing coal.

Procedure and sources of data

A study along these lines has already been made in the Minneapolis-St. Paul market.⁴ The proposed studies contemplate an even more intensive survey and analysis.

If it is deemed advisable that each regional study be undertaken by a university or other research agency in or near the market area, and if several of these surveys are started simultaneously by various organizations, it is desirable that a coordinating committee be formed. The members of this committee should consist of a representative from each organization undertaking the studies and a few advisers selected from the industry and other interested groups.

Some data are already available:

- 1) Flow of coal from producing fields to consuming states (see pp. 61, 114, 115)
- 2) Consumption of coal by counties (see p. 63)
- 3) Consumption of coal by uses (see pp. 62, 63, 114)
- 4) Channels of distribution (see pp. 59, 60)
- 5) Prices of coal

The price data are inadequate, but the revisions already made by or recommended to the Bureau of Labor Statistics will result in improved data in the future. In addition, the completion of the suggested project on the development of price indexes (Part II, C, 1) will furnish valuable material for use in these regional studies.

- 6) Competition with other fuels (see p. 66)

In developing material for this section, it will be advisable to cooperate with the Committee on Prices in the Petroleum

⁴ Roland S. Vaile and Victor G. Pickett, *Coal Distribution in the Twin Cities* (University of Minnesota Press, 1932).

Industry. Available data are so scanty that a substantial quantity of supplementary material must be collected. It is of utmost importance, therefore, to secure early in the study the cooperation of local coal dealers' associations, leading industrial consumers, railroads, and other local agencies.

**B STUDIES OF SPECIAL FUNCTIONS OR ASPECTS OF
THE INDUSTRY**

Under this heading are grouped seven separate studies, each dealing with phases or problems of the industry that are of especial importance at this time or that represent areas of research not yet intensively explored.

1 Price Structure and Pricing Policies

Of vital importance to research in price problems is an understanding of the price structure and the specific factors and conditions that business men take into account when they establish prices for given commodities. It is with these aspects that this project is concerned.

a Price Structure ⁵

On the assumption that the studies of important marketing areas will analyze the structure of wholesale and retail prices, this project will deal primarily with mine and destination prices. It will analyze the price mechanism and structure evolved under the Bituminous Coal Code, and also the changes in the structure and the problems encountered in price fixing and administration that will undoubtedly occur under the Bituminous Coal Act of 1937 (see Part II, B, 3). The Code provided for marketing agencies that represented at least two-thirds of the commercial tonnage of a coal district or group of districts and empowered them to establish minimum prices for the different grades and sizes of coal. In those fields in which market agencies were not created, the Code Authority was given the responsibility for setting minimum prices. The prices thus agreed upon were subject to the: (a) approval of the presidential member, who could permit within limits a reduction or in-

⁵ For a description of the price structure see Part I, E.

crease in the established prices; (b) review of the NRA Administrator. The marketing agencies were required to report their prices to the proper Code Authorities and the original prices as well as subsequent changes were ordered to be published. Sales below minimum prices were forbidden.

The innumerable prices established under the Code and published by the Code Authorities or other agencies would have to be compiled and analyzed to give a comprehensive description of the price structure. For each district and area the important variations in prices and the subsequent changes during the period for which data are available would be shown. Price variations due to differences in the rank or grade of coal, in the size specifications and the preparation given the coal, and in the uses to which it may be put would be examined. Consideration would also be given to price variations among market areas that result from differences in freight rates, partial absorption of freight rates by operators, location, transportation facilities, the competitive situation in the markets supplied, costs of production, and similar factors. The nature of such price variation is indicated by the example cited in Part I, E.

Other items of less importance, such as the quantity sold, the type of consumer (railroads, public utilities, domestic buyers, etc.), the period covered by the sales contract, the financial position of the operating companies, the relations between producers and buyers, and seasonality should also be studied.

The basic data for the period under the Code are those published in the Minimum Fair Price Lists for Bituminous Coal and Beehive Coke established by the Code Authorities. Monthly price lists covering October 1933 to January 1935 were made available by the several Code Authorities to their respective members. The price lists can be obtained for research purposes. The subsequent changes in the price structure and materials bearing on the pricing problems to be encountered by the National Bituminous Coal Commission of 1937 may be obtained from the proceedings of the public

hearings on coal prices held by the Commission, the releases of the Commission, the data compiled by the Office of the Consumers' Counsel of the National Bituminous Coal Commission, and the suggested price lists and other information submitted to the Commission or otherwise made available by the producers' organizations created under the Law. These data should be supplemented by those published in trade journals and newspapers, those made available by marketing agencies, and the price data collected by the United States Bureau of Labor Statistics.

b Pricing Policies

The above study will disclose the price structures that have been evolved in the various producing fields and the industry as a whole. The regional studies in production and in distribution and consumption will bring to light the relative importance of the many forces and conditions that determine price levels and trends. The project on pricing policies will deal with the particular factors that coal operators take into consideration when, in specific situations, they set prices for given sizes and grades of coal. The problem here is to determine how price decisions are arrived at—what factors are considered and their influence on price determination.

The price-setting procedures and policies of individual companies would be analyzed and the competitive trade practices of the industry ascertained. The analyses would deal with the prices for specific sizes and grades of coal. Those in charge of the project would have to secure the cooperation of executives of a group of companies sufficiently diversified to be fairly representative of the industry.

The procedures used to establish prices, the data currently compiled by the company for price-setting purposes and the use made of them would be described. The following questions indicate the approach that might be used to determine the factors considered and the relative importance of each:

a) What information concerning production costs is avail-

able to those who make price decisions for particular companies?

- b) How widely does the difference between production costs and price vary from time to time? Under what conditions is the excess of price over costs substantial, small, or negative?
- c) What percentage do labor costs constitute of total costs? Are labor costs considered to be rigidly fixed or subject to change? If subject to change, how are modifications brought about?
- d) How important are overhead costs and how are they distributed?
- e) What effect do volume of sales and days worked by the mine have on the prices quoted and the major producing costs?
- f) How do the prices asked for contract sales differ from those for spot sales and what factors account for these differences?
- g) What proportion of output is usually sold on long term contracts—sales with delivery dates extending beyond 30 days?
- h) What are the terms and conditions of sales?
- i) Does the quantity sold affect the price; if so to what extent?
- j) Do captive mines sell coal in commercial markets; if so, how do the prices charged to affiliated companies differ from those charged in commercial markets?
- k) To what extent do the prices obtained for coal sold in commercial markets cover the total costs of production, including return on capital invested?
- l) What effect do price changes have on the volume of coal sold?
- m) How important are market factors (such as competing fuels, economies in the use of coal, storage practices, classes of users, organization, and methods of distribution) in determining prices?
- n) Do prices differ for the various markets supplied; if so, what factors account for these variations?

- o) Does the company attempt to establish a sales budget based on market analyses and its share of the industry's business?
- p) In setting coal prices how much consideration is given to the prices charged for competing fuels?
- q) How do the prices quoted compare with the prices actually received?
- r) How are pricing procedures and policies altered during periods of depression?
- s) To what extent does 'distress' coal en route to market affect prices?
- t) Is there a heavy customer turnover or do buyers continue to purchase their coal from the same company?
- u) When prices change what happens to the prices previously charged on long term contracts?
- v) How much of a price differential will customers pay for quality? For sizes?
- w) To what extent do competitive trade practices affect the f.o.b. mine price paid by consumers of coal?

The project is primarily a field study. Most of the information would have to be obtained directly from the co-operating companies. All published data that bear directly on price-setting should be examined. Particularly helpful would be the studies of costs, sales realizations, and margins prepared by the Bituminous Coal Section of the Research and Planning Division of the NRA, as well as similar data now being compiled by the Bituminous Coal Commission of 1937.

2 Flow of Capital into and out of the Industry

Coal mining, like other extractive industries, differs from most manufacturing industries in the utilization of capital invested. While buildings, and to some extent even equipment, used in manufacturing can sometimes be adapted to the making of a moderately different range of products, a coal mine cannot be used for any purpose except the mining and preparation of coal. Because of this relative im-

mobility there can be no return on or recovery of invested capital when a mine is not in operation.

This peculiarity of extractive industries lends particular interest to a study of capital formation in the bituminous coal industry. In addition, the generally accepted fact that this industry has suffered from overcapacity makes a study of the flow of capital into and out of it of vital concern to present and potential investors. Finally, the importance of coal as a natural resource makes a study of this problem a matter of public concern.

Outline of project

In studying capital accretions it will be necessary to measure both fixed assets and working capital. The nature and amount of fixed investment varies with the type of mining, but in general the fixed capital includes preliminary and developmental expenses in addition to equipment such as cars, tracks, tipples, screens, steam shovels, and mechanical cutters and loaders. Such investments may be made at the time of the opening of a mine or after it is in operation. In addition, a certain amount of working capital is required to finance operations.

Both the sources and the areas into which the capital is going should be ascertained. Did it come from the public sale of securities? Are companies in other industries developing captive mines? Are established coal companies reinvesting their earnings, expanding their activities, or shifting their equipment? The answer to each question should separate increases in the total capital invested in the industry from movements in capital from one area to another.

The opening of new mines and the enlarging of the equipment of old mines should be related to other developments, such as the extension of railroad facilities and highway building, union restrictions, inherent characteristics of the coal which allow screening, and the size of the seam which limits the use of loading machines.

The ordinary flow of capital out of the industry is affected by the depreciation, depletion, and maintenance policies of

the individual operators. Accordingly, their adequacy must be appraised. In addition, allowance must be made for the wastage of capital when mines are abandoned before the capital has been fully used and when the capital is written down during reorganization.

By considering the movements in each district, it should be possible also to appraise the mobility of capital in the industry as a whole and the net addition or draft. The somewhat local character of the industry makes it desirable to study the flow of capital into and out of specific areas; to know the rates at which capital formation is progressing in various districts.

Sources of data and procedure

From the records of the United States Bureau of Mines it will be possible to determine the year when each mine in the country was opened and whether it is still in operation. If it is not being operated, the year when it closed is given. This information will serve as a guide to actual data on this type of inflow and outflow of capital.

The Bureau of Mines has records also of the number of certain types of machine in use. Their value would have to be estimated.

The Census of Mines and Quarries includes a tabulation by states of expenditures for development and the cost of equipment and other machinery purchased. It should be possible to break this down by counties.

Basic data on total capital invested and, for commercial mines, the amount of depreciation and depletion charged off each year could be obtained by means of a special tabulation of income tax returns by the Bureau of Internal Revenue. These data are available only for the industry as a whole and do not apply to captive or consumer-owned mines. The Bureau tabulated the capital investments of coal companies for the use of the Coal Commission of 1922. As a supplement, some data could be secured from the annual financial statements of the large coal companies.

The manufacturers of equipment used in coal mines

constitute another important source of information on the flow of capital into the industry. From them the value of equipment purchased by coal operators could be secured.

To analyze the extent of capital formation in specific areas, the cooperation of large operators is especially essential. Most of the published data for these companies as well as their income tax returns relate to their entire operations. To establish the rates of capital formation in various areas a breakdown of capital expenditures and rate of consumption of capital by areas will have to be obtained directly from the companies operating mines in more than one district.

The study should be directed by someone acquainted with the problems involved in the measurement of the flow of capital, since adjustments will have to be made in order to express in terms of a common base the capital expenditures made at various times.

The measurement of the flow of capital into and out of the bituminous coal industry is beset with many difficulties. The Committee, while recognizing the shortcomings of the available data and the many obstacles that must be surmounted, is of the opinion that the formation and utilization of capital is one of the aspects of the industry greatly in need of research and one that should be undertaken even though the first attempts bring forth only tentative conclusions.

3 The Bituminous Coal Industry under Governmental Regulation^a

The problems to be solved by a national policy directed toward remedying the ills of the bituminous coal industry are numerous, but the goal to be attained can be stated simply: the continuing provision of coal at as low a cost as is consistent with a livelihood for those engaged in the industry and with rational conservation of coal resources.

Because of the key importance of coal in a power econ-

^a This project, which was prepared by Ralph J. Watkins, has borrowed heavily from *Regional Shifts in the Bituminous Coal Industry*, by W. G. Fritz and T. A. Veenstra, a publication of the Bureau of Business Research, University of Pittsburgh, of which Dr. Watkins is Director.

omy, the persistently grave disorders of the bituminous industry seem to have shaped events in the direction of greater public regulation. Most of the proposals have involved Federal action, it being more or less recognized that the distribution of the industry over many states makes state action ineffective. Moreover, the problems of bituminous coal production cannot be separated from the problems of transportation. The interstate character of most of the coal trade further complicates the problems.

For many years various activities of the Federal government have been concerned with the bituminous coal industry. The Geological Survey is engaged in determining the location and the extent of coal reserves. The Bureau of Mines studies technical problems of mining, promotes safety work, and collects statistics. These two agencies provide needed information to the industry and the public, but their activities can hardly be called regulatory.

A third Federal agency whose activities more nearly approach regulation of the coal industry is the Interstate Commerce Commission. It is not directly concerned with the mining of coal, but its decisions with respect to the reasonableness of freight rates on coal have a profound bearing on the ability of coal producing fields to compete in various markets. In addition to the regulation of freight rates, the Commission is charged with responsibility for a fair distribution of cars to mines (especially important in times of car shortages), and the regulation of the pipe lines of a competing industry, etc.

Federal interest in the industry has been expressed also by means of:

FUEL ADMINISTRATION DURING THE WAR

Because of the exceptional demand for coal arising from War activities, the United States Fuel Administration was created to regulate both prices and distribution. Its objective was not stability in the industry but the provision at 'reasonable' prices of the very large quantities of coal needed by the industries supplying war materials. When

the Fuel Administration discontinued its control, the industry returned to a highly disorganized state aggravated by conditions arising out of the War.

EMERGENCY REGULATION DURING THE STRIKE OF 1922

A serious problem of price control and regulation of distribution in the bituminous coal industry arose during the strike period, April 1 to August 17, 1922. At first, because of the expectation of an early settlement of the strike, emergency regulation was not attempted. During May, however, it became apparent that such regulation was necessary to prevent unprecedented price rises and inequitable distribution of coal. Conferences of representatives of coal operators were called for May 18 and again for May 31 by the Secretary of Commerce to consider means of avoiding undue disruption of the market. For a time the Secretary fixed prices through the cooperation of operators acting individually. Later the Interstate Commerce Commission participated in the regulation. In July the Presidential Fuel Committee was created. This Committee consisted of the Secretary of Commerce, as chairman, the Secretary of the Interior, the Attorney General, one member of the Interstate Commerce Commission, and the Federal Fuel Administrator. The Fuel Committee worked through three subordinate bodies: (1) an administrative committee; (2) district coal committees; (3) governors' fuel committees. The Federal Fuel Distributor was chairman of the administrative committee. Although his authority was not challenged, the office was without statutory provision until September 22, 1922, when the Cummins-Winslow law, which provided for stringent regulation during the emergency, went into effect. The coal strike had been terminated a month earlier. Accordingly, the Federal Fuel Distributor's function after the passage of the Act was chiefly to facilitate orderly reestablishment of normal conditions in the coal market.

UNITED STATES COAL COMMISSION

The United States Coal Commission was established in 1922 "for the purpose of securing information in connection with questions relative to interstate commerce in coal, and for other purposes." Essentially a temporary fact-finding body, it conducted investigations and made a comprehensive report covering, for the bituminous coal industry, labor relations, safety, civil liberties, waste, irregular operations, overdevelopment, and transportation. Little has been done about its recommendations.

BITUMINOUS COAL CODE UNDER THE NRA

The bituminous coal industry was regulated by agencies established under the National Industrial Recovery Act. Operators were required to abide by the Code of Fair Competition for the Bituminous Coal Industry which called for: (a) the maintenance of minimum prices; (b) the elimination of unfair competitive practices. The Code had the force of law and was binding on all operators. In addition, the operators were required: (a) to observe certain conditions regarding hours and wages; (b) to bargain with the representatives chosen by their employees; (c) not to interfere with the free choice of representatives by their employees. The Code was nominally in force from October 1933 to May 1935, when the Schechter case decision by the Supreme Court led to the abandonment of the codes. The Code imposed self-regulation on the industry rather than Federal regulation. The power of the Federal government, however, was nominally placed behind the industry to enforce compliance with the provisions of the Code. Experience under the Code was so short that scarcely any conclusion can be drawn concerning its effect on long time trends in the industry.

BITUMINOUS COAL CONSERVATION ACT OF 1935

The Bituminous Coal Conservation Act of 1935 (commonly referred to as the Guffey-Snyder Coal Act) was passed

in August to take the place of the abandoned Bituminous Coal Code. This Act shared the fate of its predecessor. The Supreme Court, on May 18, 1936, declared that the Act's regulation of wages and hours was an invasion of states' rights and thus beyond the constitutional powers of the Federal government, and held the entire Act invalid on the ground that the provisions with respect to price-fixing and determination of commercial practices in interstate trade were inextricably linked with the invalid wages and hours provisions; it reserved judgment, however, on the validity of the price-fixing and unfair-practices provisions. Although the Court's decision ended this experiment almost at its inception, we describe its provisions. The Act created a National Bituminous Coal Commission in the Department of the Interior to administer the law. To enforce compliance, a tax of 15 per cent of the sales value of coal at the mine was levied, with the proviso that 90 per cent of the tax should be refunded to operators who complied. The Act required the organization of 23 district boards of coal operators who should determine minimum prices for coal according to a prescribed formula (weighted average of production costs in the minimum price area to which, under the Act, a district belonged). Such prices were subject to approval by the Coal Commission. Sales below minimum prices were forbidden. 'Unfair methods of competition' were listed and banned by the Act. The Coal Commission could set maximum prices if it deemed such action to be in the public interest.

Collective bargaining by representatives of the miners' own choosing was explicitly provided. Furthermore, employees had "the right of peaceable assemblage", were "entitled to select their own checkweighman", and were not to be "required as a condition of employment to live in company houses or to trade at the store of the employer". A Bituminous Coal Labor Board of three members was created with: a representative of the employers; a representative of the organized employees; and an impartial chairman who had neither any financial interest in the industry

nor any connection with an organization of the employees. The Labor Board had authority to adjudicate disputes arising under the provisions of the Act. It could hold elections to determine who were the freely chosen representatives of the employees. Maximum hours of work agreed on by employers producing two-thirds of the national tonnage and by representatives of a majority of the workers were binding on all Code members. Likewise, a wage agreement negotiated in any district by producers of two-thirds of the tonnage and representatives of the majority of workers was binding on all producers in the district.

Consumers were to be represented in the National Coal Commission by a consumers' counsel, who had the right to be heard in all matters affecting their interest. He could require the Commission to furnish information or to conduct investigations that he deemed necessary.

BITUMINOUS COAL ACT OF 1937

The Bituminous Coal Act of 1937 was passed by the 75th Congress to replace the Bituminous Coal Conservation Act of 1935. Except for the fact that it confers on the Commission specific power "to prescribe for code members minimum and maximum prices, and marketing rules and regulations", and to conduct research work the 1937 Act agrees in general with the earlier Act with respect to the provisions governing the determination of costs and prices and the banning of unfair trade practices. A National Bituminous Coal Commission is created in the Department of the Interior. It is to promulgate a "Bituminous Coal Code". Producers who accept membership in the Code are required to observe the minimum and maximum prices established by the Commission. Minimum prices are to be proposed by each of 23 district boards of Code members, but the Commission may approve, disapprove, or modify them. The minima are to be set "to yield a return per net ton for each district in a minimum price area . . . equal as nearly as may be to the weighted average of the total costs, per net ton . . . of the tonnage of such minimum

price area. . . . 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." Maximum prices, if the Commission finds it in the public interest to establish them, are to be set at a uniform increase above minimum prices so as to yield a reasonable return in the aggregate.

Observance of the provisions of the Code is secured by exempting producers who are members of the Code from the 19½ per cent tax on the sales price of coal or the fair market value if coal is disposed of in some other manner than by sale. All producers, Code members and non-Code members, are required to pay a tax of one cent per net ton on all coal sold or otherwise disposed of.

Labor provisions of the Act differ from those of the 1935 Act in that they constitute merely a statement of public policy. The labor provisions state that (a) employees shall have the right to bargain collectively through representatives of their own choosing; (b) employers shall not interfere with this right or discriminate against employees for exercising it; (c) employees shall not be required to join an association of employees in which the producer has any share of direction or control. To secure observance the Federal Government and its agencies may purchase coal only from producers complying with the labor provisions.

Consumers are to be represented in the National Bituminous Coal Commission by a consumers' counsel who shall have the right to be heard in any proceeding before the Commission. He is to represent the interest of the consuming public and can make independent investigations and require that necessary information be furnished by the Commission.

Plan of research

The difficulties that face the National Bituminous Coal Commission in administering the price-fixing features of

the Act are little short of appalling. Regulatory schemes designed to replace the automatic market determination of prices raise many complex problems. Market influences that affect prices are many, varied, and subject to continuous change, and all must be weighed by the regulatory group. Even under the best of circumstances, the Commission and its administrative agencies will make many mistakes, and smoothness of operation is not likely to be achieved promptly.

The framers of the law were evidently aware of these difficulties, since they have attempted to give the Commission and the consumers' counsel ample authority for the collection of pertinent data and have specifically authorized the Commission "to initiate, promote, and conduct research designed to improve standards and methods used in the mining, preparation, conservation, distribution, and utilization of coal and the discovery of additional uses for coal, and for such purposes shall have authority to assist educational, governmental, and other research institutions in conducting research in coal".

Disinterested research groups obviously have an unusually favorable opportunity for concurrent study of the operation of the Act. The statistical evidence promises to be rich, and the research obligations (i.e., specific authorization and directions) of the Commission and the consumers' counsel should make for effective working relations between the Commission and non-governmental research agencies as well as between the consumers' counsel and the latter. Moreover, sound public policy will require independent appraisals of the operations of the Act by disinterested research groups, however comprehensive the Commission's fact-finding and appraising may be. Accordingly, the Committee on Prices in the Bituminous Coal Industry recommends that the Conference on Price Research promote and coordinate a program of research designed to throw light on and provide an independent appraisal of the pricing of bituminous coal under the Bituminous Coal

Act of 1937. A tentative and summary outline for such a project follows.

*Analysis of the Pricing of Bituminous Coal under the
Bituminous Coal Act of 1937*

- a) Determination of costs of production under the Act
 - Cost components
 - Methods of weighting
 - Cost variations among districts and producers
- b) Determination of minimum prices under the Act
 - Methods
 - Relation to costs, market variations, changes in general wholesale prices and in prices of competitive fuels
- c) Determination of maximum prices under the Act
 - Rationale and methods
 - Effect on market prices and production
- d) Trade practice control in relation to price competition
 - Customary practice in the industry
 - Effects of proscription of trade practices
 - Enforcement methods
- e) Effects of labor organization on price competition
 - Extent of unionization
 - Effects on inter- and intra-regional competition
 - Labor costs in relation to price
- f) Consumer protection under controlled competition
 - Work of the consumers' counsel
 - Consumer interest in cost and price determination
 - Effect of publicity
- g) Influence of price determination under the Act on inter-regional and inter-company competition, competition of substitute fuels, overcapacity, and investment return
- h) Appraisal of statistical controls under the Act—cost, price, and market data
- i) Appraisal of the effectiveness of price determination under the Act

Analysis of basic causes of instability in the industry

Overcapacity in mines

Oversupply of labor

Geographic variations in costs

Freight rate differentials

Changes attributable to the Act

Conservation of coal resources

Social sharing of the cost of instability

Influence on competing sources of energy

Relationship to consuming industries

Influence of a coal policy on national economic policy

4 Distribution Channels and the Flow of Coal to Consuming Markets

To what markets does the bituminous coal mined by the 6,000 odd mines go? What agencies are responsible for its distribution? The answers to these questions are of major importance to shippers, distributors, and traffic men. They would reveal the important regional shifts in the distribution of bituminous coal and would supply information on the markets now open to the coals of each field and the possibilities a given field has of expanding its markets. It would also make available basic data that would add materially to the value of many of the studies proposed in this program of research.

a Channels of Distribution

Bituminous coal is distributed by sales departments of operating companies, separately incorporated sales agencies, independent wholesalers, dock companies, and retailers. From the data in the files of the Geological Survey (since transferred to the Bureau of Mines) and the information published yearly in the *Keystone Coal Catalogue*, Messrs. Kiessling and Tryon determined the important sales agency centers in the bituminous coal trade, estimated the proportion of the district output produced by mines maintaining connections with separately incorporated sales agencies and calculated the percentage of the total production sold by

these agencies during 1921. Because of the limitations of available data, this initial analysis of the "cross relations between the producing districts and sales agency centers" is only a rough approximation. The important source of information on the channels of coal distribution is the 1929 Census of Mines and Quarries. For that year the Bureau of the Census collected invaluable information on coal sales by distributing agencies. The individual mine schedules contain the number of tons shipped and the total value received for each of the six classes of sales listed on page 117. For details of sources of data see Ap. I, C, 1, c.

Outline of study

Because of the work involved and the difficulty of obtaining information, the collection of original data cannot be undertaken by a private agency. The purpose of this study is to bring together and interpret the data compiled by the Bureau of the Census in the 1929 Census of Mines and Quarries and the censuses of wholesale and retail business. Funds should be provided so that these data, especially the latter, can be brought together in a form that will ensure effective use. The data in the files of Federal bureaus or in trade publications should also be utilized.

The study should show for each district and for all mines the proportion of coal sold or assigned in 1929 to affiliated or owning corporations, to consumers invoiced by the main office of the mining company, and to independent wholesalers and jobbers, as well as the proportion of the total tonnages handled by separate or branch sales offices of the mining company and that distributed by separately incorporated sales agencies owned by the same interests as the mining company. To the extent that the census and collateral data make possible, the important coal consuming cities and market areas supplied by each field and the percentage of the total volume handled by each type of selling agency should be ascertained. The detailed information with respect to the number of tons of coal sold, dollar amount of net sales, number of employees, wages, etc.,

which was collected by the censuses of wholesale and retail business, should be compiled separately, if possible, for both bituminous coal and coke, and should be presented by cities and market areas. Both groups of data should be carefully analyzed and interpreted.

b Flow of Coal to Consuming Markets

The United States Bureau of Mines received more requests for information concerning the movement of coal from the many producing fields to the major coal markets than for any other type of information. Probably no single phase of research would interest producers and distributors as much as a study of the distribution of bituminous coal. The data made available by such an analysis would be of immeasurable value to the studies of major producing fields and of important market areas. They are also essential for an understanding of the movement and behavior of coal prices.

There are no complete data on the flow of bituminous coal from mines to particular markets (for those available from the Bureau of Mines, see Ap. I, C, 1, c). The large 'blind spots' are the all-rail movements north, south, and east from the Appalachians, the total movement from Alabama, and the total movement from the coal producing states west of the Mississippi River. The Bureau of Business Research of the University of Pittsburgh has brought together for selected fields certain collateral information derived from the data compiled by "the Pennsylvania Geological Survey, the Ore and Coal Exchange, the Ohio Bureau of Coal Statistics, the Tidewater Bituminous Coal Statistical Bureau, and the Coal Control Association of Western Pennsylvania, as well as from such publications as *The Coal Trade* (not published after 1921), *Saward's Annual*, the *Annual Statistical Report of the American Iron and Steel Institute*, and the *Monthly Summary of Foreign Commerce of the United States*".¹

Current data on the flow of bituminous coal from produc-

¹ W. G. Fritz and T. A. Veenstra, *Regional Shifts in the Bituminous Coal Industry*, pp. 9-10.

ing fields to consuming states must be collected by a Federal agency. It is hoped that the National Bituminous Coal Commission will undertake the compilation of such data.

The Committee on Prices in the Bituminous Coal Industry believes that all existing data on the distribution of bituminous coal should be brought together and analyzed, and that the markets open to the coals of each field and the important regional shifts in production and distribution should be assembled in one or more volumes. Many of the basic data have already been compiled and published in tabular form by the United States Bureau of Mines in its supplements to the Monthly Coal Distribution Reports. Suggestive of the type of analysis and interpretation to be made is the treatment of distribution data in the chapters dealing with this subject in *Regional Shifts in the Bituminous Coal Industry*.

The study should do more than present the facts of distribution. It should delineate the market areas and analyze the special forces and conditions that determine the flow of bituminous coal to particular markets. This will involve a consideration of the freight rate structure, the influence of captive mines, transportation facilities and practices, relations between buyers and sellers, the character of the demand for coal, the use of advertising, seasonal variations, grades of coal required, the location of producing fields, trade practices, and similar factors.

5 Consumption of Coal by Use in Important Markets and Areas

The relative importance of certain classes of users is largely a matter of surmise. From the standpoint of the producer who must plan his sales budget and gauge the future possibilities of the coal market, there is urgent need for a study of the trends of consumption of bituminous coal by classes of users. For this purpose it is necessary not only to bring together in usable form the data now available but also, which is more important, to collect a wide range of consumption data by counties, markets, and trade areas. These

data are also required for the studies of important market areas (Part II, A, 2). Bureau of Mines data are described in Appendix I, C, 1, b. Other data have been compiled for certain years. Of special importance are the 1927 and 1929 Censuses of Manufactures. For 1929 the Bureau of the Census compiled by counties data on consumption by manufacturing industries and by mines and quarries. For the same year the Geological Survey in cooperation with the Bureau of Mines compiled and published by counties data on the consumption of coal by electric public utility power plants. The consumption of bituminous coal and other fuels by the Federal government is available for the year ending June 30, 1930. In 1935 the Bureau of the Census collected information concerning the consumption of fuels by manufacturing industries, but, because of the lack of funds, the questions pertaining to fuel consumption have not been edited or tabulated. Data on the consumption of coal at coal mines are available by counties for many years and similar data by coke plants could be compiled from the records of the Bureau of Mines. Consumption of coal by household and small industrial users has not been compiled since 1917.

Program recommended

The immediate task is to assemble, analyze, and interpret the various data now available. The changing requirements of the more important branches of consumption would be disclosed. The reasons for these changes and their effects upon the economic status of the various producing areas should be ascertained. For obvious reasons the collection of additional data cannot be undertaken by a private research agency. Funds, however, could be made available to certain Federal bureaus for the purpose of tabulating data that have been collected but not edited and assembled, and for special breakdowns by counties and market areas where necessary. It is especially desirable that the basic data on the consumption of fuels by manufacturing industries,

which the Bureau of the Census has in its files, be made available in usable form.

One of the most constructive steps at this time would be the preparation of a statement outlining for this industry the types of consumption data needed, the sources, the units or areas for which they should be compiled, the form in which they should be made available and the frequency of collection. This task could best be carried out by a committee composed of economists, industrialists, and representatives of the Federal bureaus that are collecting coal statistics. Such a venture might well be sponsored by the Conference on Price Research.

6 Economies in the Use of Coal

One of the principal factors accounting for the decrease in the demand for bituminous coal during the last decade and a half has been increased efficiency in the use of fuel. As previously stated, the movement began in 1909 but its effect upon national demand was not of real significance until after 1920 when the post-War price level was a powerful incentive. A study of economies in the use of coal shows that the reduction in fuel consumed per unit of product has varied from industry to industry.⁸ From 1909 to 1929 these reductions in five groups of industries or services ranged from 21 to 66 per cent, the average for all industries or services included in the study being 33 per cent. Data for subsequent years indicate that the movement for fuel economy has continued, but at a much slower pace. In more recent years, economies in the use of coal have been applied to households, by means of insulation, more efficient radiation, automatic heat controls, and improved standards of furnace construction. For more detailed discussion of economies in the use of coal see Section F, 1, b, (5).

The published data relating to fuel economy are summarized herewith. They appear in the annual reports of the

⁸ F. G. Tryon and H. C. Rogers, *Statistical Studies of Progress in Fuel Efficiency* (Transactions, 2d World Power Conference, Vol. 6, Sec. 12, 1930), pp. 343-65.

Bureau of Mines. The most complete statistical analysis of fuel economy was made by F. G. Tryon and H. O. Rogers (footnote 8) who measured the progress in fuel efficiency from 1900 to 1929. They have extended the data for electric public utilities back to 1902 and for steam railway locomotives back to 1904. They compiled also from various sources data for cement manufacturing and for petroleum refining, 1909-1929, for a group of manufacturing industries, 1909-27, and for all industries, 1904-29.

This project would bring up to date the admirable study of Messrs. Tryon and Rogers and would extend and perfect wherever possible the statistical record of fuel efficiency. It would then ascertain for important industries and services

SOURCE	INDUSTRY OR SERVICE	PERIOD
Federal Power Commission	Electric public utilities	1913, 1917, 1919 to date
Interstate Commerce Commission	Steam railway locomotives	1916 to date
Bureau of Mines	By-product coking*	1913 to date
Bureau of Mines	Iron and steel blast furnaces	1912 to date

the practices developed by the more efficient companies as well as the devices and procedures used to achieve effective utilization of fuel. In view of the balance between investment cost and operating economy beyond which the cost of power might increase depending upon particular conditions, an attempt would be made to estimate the possibilities of the general introduction of best practices for specific industries and services.

The problems of measuring average efficiency are many and complex. "To measure the change in average efficiency it is necessary to have not merely heat balances for a few individual plants but statistical records of the total quan-

* Coal equivalent of gas, tar, oil, and breeze recovered.*

*DIRECTOR'S COMMENT: I am glad to note that the coke industry goes the packing industry one better. The packing industry recovers only the squeal of the hog; but the coke industry recovers the 'breeze'. Yes, I looked it up in the dictionary and find it is a perfectly good technical term! Harry Jerome

tity of the fuel and energy in all forms consumed by large numbers of plants, and to analyze these records in relation to the amount of work done or the volume of product.”¹⁰

Because of the technical nature of the subject, the project should be carried out in cooperation with a carefully selected advisory committee some of whose members are chosen for their intimate knowledge of the problems of fuel efficiency, others for their familiarity with the practices of the important fuel-consuming industries.

7 Changes in Sources of Energy utilized in the United States with reference to
Competition faced by Bituminous Coal

For many years the Bureau of Mines has published data on the relative rates of growth of fuel and energy. These governmental statistics of the annual supply of energy from mineral fuels and water power in the United States cover anthracite, bituminous coal, domestic oil, imported oil, natural gas, and water power. Notwithstanding the Bureau's statements to the effect that these data cover the entire output of crude petroleum and natural gas, that “nearly half of the natural gas is used in the field for drilling or operating oil and gas wells and pipe lines and for the manufacture of carbon black”, and that “more than half the oil is used in the form of gasoline, kerosene and lubricants”, the statistics are frequently used to indicate the competitive position of coal with other fuels and energy. Part of the fuel oil, gasoline, natural gas, and water power used in the Bureau's calculation is not directly competitive with coal. Moreover, since the production of coal alone, or for that matter of any one of the competing forms of energy, is not necessarily a measure of the relative proportion of useful energy supplied by that fuel, the increased efficiency in the use of the fuel must also be considered.

It is, for these reasons, highly desirable that some attempt be made to develop a measure of the relative competitive position of coal with other sources of fuel and energy.

¹⁰ Tryon and Rogers, *op. cit.*, p. 344.

Such an indicator would be of real value to producers, miners, and consumers, all of whom are affected by either an inadequate or an excess productive capacity in the industry. Moreover, any attempt to measure future demand must deal with data of this character.

Outline of project

The project should investigate and attempt to answer the following questions:

What have been and are the energy requirements of the United States and to what extent have they been and are they supplied by domestic fuels?

Of the total requirements, what proportion is furnished by coal?

Of the total requirements, what proportion is directly competitive with coal; i.e., what portion of the energy not supplied by coal could be replaced with energy derived from coal?

To what extent has the development of industries requiring or using other forms of energy so increased the total demand for energy as to result in an increased use of energy supplied by coal in other fields of activity?

The exact procedure cannot be outlined in detail but would be developed as the study progresses. It is suggested that, since a considerable amount of technical knowledge is necessary both to develop and to interpret many of the basic data, those who make the study should have experienced technical advisers.

One of the problems requiring examination would be the elimination, from the total figures of energy consumption, of the energy utilized for the manufacture of carbon black and the refining of petroleum and that portion of the gasoline, kerosene, and the other oils not competing with coal. Some consideration should also be given to the increase in energy requirements from the development of sources of energy other than coal, and the effect this has had upon the competitive situation of coal.

The basic data would have to be obtained from the published reports and the files of the Bureau of Mines, the Geological Survey, the Federal Power Commission, and the Bureau of the Census. Other possible sources are the Automobile Chamber of Commerce and the Petroleum Institute.

C STUDIES DEALING WITH THE DEVELOPMENT AND IMPROVEMENT OF THE FACTUAL RECORD OF THE INDUSTRY

The Committee's survey of available price and related data disclosed that a vast amount of quantitative information is available (see Ap. I). This material has been built up by the work of many Federal agencies, including, among others, the Bureau of Labor Statistics, the Bureau of Mines, the Geological Survey, the Bureau of the Census, the Interstate Commerce Commission, and the Federal Trade Commission. It has been estimated that over thirty bureaus in the Federal government publish some data relating to the coal industry. In addition, special agencies have operated for certain periods, such as the Fuel Administration during the War, the Coal Commission of 1922, the Bituminous Coal Code Section of the Research and Planning Division of the NRA, and the National Bituminous Coal Commission, as well as many Congressional committees. Other important sources of data bearing on the coal industry are the bureaus of mines and similar departments operated by many of the important coal producing states. Lastly, information on prices of bituminous coal is found in more than a dozen trade papers, ten of which are especially important sources of price data. (Table I-5 and Ap. I, A, 2.)

This ever increasing amount of statistical material is published in current issues of the trade papers and in a multitude of special reports by numerous Federal, state, and private agencies. Few if any libraries have a complete collection of these papers and pamphlets. Accordingly, it is virtually impossible for any student to obtain readily all the information that has been published and that he

needs. Moreover, detailed price series have never been assembled from the various issues of the trade papers or from the files of the Wholesale and Retail Price Divisions of the Bureau of Labor Statistics.

In order to provide many of the basic data needed for the studies outlined in the preceding projects, the Committee on Prices in the Bituminous Coal Industry recommends that the following studies, which deal primarily with the development and improvement of the factual record of the industry, be undertaken as soon as possible. Because of the mass of material available, four separate projects are suggested.

1 Development of Price Series

As a supplement to the study of the price structure of the bituminous coal industry (Part II, B, 1) and as a means of providing some of the price data needed in the studies of important market areas (Part II, A, 2), as well as for the purpose of making series of prices available to all students of the industry or of prices in general, the two projects outlined below are submitted to the Conference on Price Research. In connection with these it is important to point out that to secure f.o.b. mine prices for specific markets it is necessary to consult many issues of various trade journals. Moreover, the available data on destination and retail prices compiled by the Bureau of Labor Statistics have not been completely summarized, and the prices they publish, which are averages of several sizes and sometimes grades, hide many significant variations in prices caused by differences in size and quality of coal.

a Series of F.O.B. Mine Prices by Producing Areas and Destination Prices by Markets

The Wholesale Price Division of the Bureau of Labor Statistics collects monthly prices of bituminous coal from mine operators, selling agents, or large distributors in 16 cities. The prices are quoted 'f.o.b. cars destination', which is the sum of the mine price and the freight rate from the

mine to the city. All the quotations are combined into three average prices: mine run, prepared sizes, and screenings.

Outline of project

Before the price structure of the bituminous coal industry or the behavior of prices of bituminous coal can be studied adequately, it is obviously essential to secure many specific series of prices. Three average prices for the country as a whole are not sufficient. The purpose of this project, therefore, is to construct, publish, and analyze series of f.o.b. mine prices by producing areas and of destination prices by markets. If the Wholesale Price Division of the Bureau of Labor Statistics is able to carry out the revisions in its collection and publication of prices, which have been developed by it and the Committee, this project will facilitate comparisons between previous and future collections of prices made by it.

Throughout the study the emphasis should be on the construction of a large number of continuous series of prices of specific grades and sizes of coal. The resulting series of f.o.b. mine prices will show both the variations in prices attributable to differences in sizes of coal produced in the same district, and differences in the mine prices of the same size of coal produced in various districts. For destination prices similar analyses can be made. It may be possible to construct series that will not only reveal the effect of sizes of coal on prices paid by carload-lot buyers but also furnish a basis for comparing prices of the same sizes of coal produced in various areas and sold in the same market. The report should serve as a source book on f.o.b. mine prices.

Sources of data¹¹ and procedure

The Wholesale Price Division of the Bureau of Labor Statistics has preserved the original schedules of prices col-

¹¹ For a detailed description of prices compiled by the Wholesale Price Division see Ap. I, A, 1, a; and for those published by trade papers see Table I-5 and Ap. I, A, 2.

lected since 1923. In many instances these reports show separately the f.o.b. mine price and the freight rate from the mine to the city which, added together, give the destination price. Thus the f.o.b. mine price and the delivered price can be secured from the same schedules. In addition, these original schedules give more detailed specifications than mine run, prepared sizes, and screenings; the prices are quoted for specific sizes of coal from specified producing fields. The Bureau of Labor Statistics will make available, under certain conditions, these original schedules from which detailed price series can be developed for 16 cities and for many producing fields.

For many cities and for many producing areas f.o.b. mine prices can be secured from trade papers. Many specific sizes and grades of coal are quoted in: *American Metal Market*, *Black Diamond*, *The Commercial Bulletin*, *Chicago Journal of Commerce*, *Coal Age* (no prices published since October 1931), *Coal and Coal Trade Journal*, *Daily Metal Trade*, *Iron Age*, *Journal of Commerce*, and *Saward's Journal*. In addition to f.o.b. mine prices, some of these sources give dock and pier prices in certain markets.

The quotations in these papers are not regarded by the trade as authentic prices. Usually they are what the operator would like to obtain for his coal rather than the amount for which he actually sells it. In spite of this qualification, series of quotations constructed from these sources would show trends in prices as well as the relationships between prices of various sizes of coal produced in the same field and of the same size of coal from different producing fields offered for sale in the same market.

The director of this study should have had experience in the construction of price series. An expert knowledge of coal is desirable but not absolutely essential.

If the studies of the price structure or of the regional market areas are in progress at the same time as this study of f.o.b. mine prices and destination prices, the research should be coordinated.

b Series of Retail Prices by Markets

The most extensive collection of retail prices of bituminous coal is made by the Retail Price Division of the Bureau of Labor Statistics. These data are published as average prices of prepared sizes for each of 38 cities, and are available monthly for 1922, 1925, from January 1928 to July 1935 inclusive, and October 1935, January, April, July, September, and December 1936. In March 1937 data were compiled for 48 cities. Future collections will be made every three months at least. For 7 of these cities run of mine prices are also compiled. Such prices conceal variations caused by differences in specific sizes. The *Chicago Journal of Commerce* publishes a comprehensive list of retail prices in the Chicago market. In addition the *Journal of Commerce* quotes the retail price of bituminous coal in New York City. The *Commercial Bulletin* lists retail prices in Boston, and the *Black Diamond* occasionally publishes retail prices in some markets. No summary has ever been made of the retail prices published by the trade papers. The purpose of this project is to provide the detailed series of retail prices needed for the studies of important market areas (Part II, A, 2). The construction of series of retail prices for markets will be of value also to many students of the coal industry or of prices in general.

*Outline of project and sources of data*¹²

The original retail coal price schedules collected by the Retail Price Division of the Bureau of Labor Statistics have been preserved for 1922, 1925, and 1928 to date. From them it is possible to construct series of retail prices for specific sizes of coal. The prices published by the Retail Price Division conceal the wealth of information available, as is indicated in Appendix II. They are average prices of coal from

¹² For a detailed description of prices compiled by the Retail Price Division prior to 1937 see Ap. I, A, 1, b; for revisions made in 1937 see Ap. II, B.

RESEARCH IN BITUMINOUS COAL

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U. S. DEPARTMENT OF LABOR
BUREAU OF LABOR STATISTICS
WASHINGTON

RETAIL PRICE
COAL

Date

Dealer's name and address

CAUTION: Please enter as of the 15th of the current month coal retail prices per ton of 2,000 pounds of coal delivered to family trade, dumped at curb or shovelled into bin from wagon without extra handling or additional charge. Enter below the amount of any additional charge for storing.
Kindly return this form to reach Washington soon after the 15th of the month.

Very truly yours,

ISADOR LUBIN,
Commissioner of Labor Statistics

NET CASH PRICES NOT INCLUDING STORAGE CHARGE

PENNSYLVANIA ANTHRACITE			BITUMINOUS COAL		
White Ash Coal	In 4-ton lots	In 2 or more ton lots	For Family Use	In 4-ton lots	In 2 or more ton lots
Egg	\$	\$	Canyon City lump	\$	\$
Stove			" " nut		
Champion			Walsenburg lump		
Pen			" nut		
Colorado	OTHER ANTHRACITE		Routt Co. Pinnacle lump		
Horace anthracite	\$	\$	" " " nut		
Furnace, 1&2 mixed			LIGNITE		
Stove, 3&5 mixed			Gorham lump 1st grade		
			" nut " "		
			Columbine lump 2nd grade		
			" nut " "		

Additional charge for carrying from curb to bin is

U. S. GOVERNMENT PRINTING OFFICE: 1915

10-10875

(Name of person furnishing information)

FIGURE 1

various producing fields. The original schedules, however, contain detailed specifications for which the price of coal is quoted. One dealer, for example, reports on the following sizes and grades: Canyon City lump, Canyon City nut, Walsenburg lump, Walsenburg nut, Routt Co. Pinnacle lump, and Routt Co. Pinnacle nut (Figure 1). From series of prices for many specific sizes and qualities in specific markets the variations in retail prices of different sizes of coal from a given field as well as of the different grades of coal from sev-

eral producing areas could be determined. In addition, the retail prices of the same size of coal in different markets could be compared. Prices of an identical size and quality of coal sold in two or more cities could even be compared. Supplementary data on retail prices should be compiled from the trade papers. When completed, the series should be made available in convenient form.

The Retail Price Division of the Bureau of Labor Statistics should be requested to make this analysis of the original retail coal price schedules. If this Division does not have funds for such a study, it would probably be possible for the person making the study to be appointed as a Special Officer in the Division and to have access to the original schedules. If the regional marketing studies are in progress at the same time as this study of retail prices, the research should be coordinated.

2 Preparation of Source Books

Two projects are included under this heading. The purpose of both is to bring together for ready reference the large amount of scattered data that have a bearing on research in prices and related problems. The first would assemble the data on costs, sales realization, and margins, and the second, all other related data. The preparation of these source books would prevent duplication of effort on the part of the many individuals engaged in research in this industry and would greatly facilitate the completion of the program of studies outlined in this report.

a Costs, Sales Realizations, and Margins

Data on costs, sales realizations, and margins are described in Appendix I, B, 1. Of special value are the detailed data compiled by the Research and Planning Division of the NRA for November 1933 through January 1935. Its reports give, by seam groups, fields, and combinations of fields, monthly data on per ton labor costs, supply costs, depreciation, depletion, royalties, salaries, taxes, compensation insurance, company house expense as well as production costs

and administrative and selling expenses. The form in which this information has been published needs revision for effective utilization. For other years the data are less comprehensive. The United States Coal Commission collected on a quarterly basis per ton labor and supply costs, general expenses, total costs, sales realization, and margins for 1921 and 1922, and the Federal Trade Commission compiled similar data for 1916 to 1918, inclusive, and for 1920. It is proposed to bring all the data together in compact and usable form and to combine those for the individual fields covered by the earlier studies so as to make them as nearly comparable as possible with the classification of fields adopted by the Research and Planning Division.

b Other Related Data ¹⁸

In addition to mine, destination, and retail prices, and data on costs, sales realizations, and margins in the bituminous coal industry, there is a wealth of information that has a bearing on its pricing policies and problems. Such data collected and published by the Bureau of Mines and other Federal agencies cover production, employment, employee output, days worked by the mine, wage rates, consumers' stocks, and mechanization. The value of this information lies in its continuity and breakdown, in most cases, by states, divisions, districts, and counties. In addition to the published data of the Bureau of Mines are the reports from the departments of mines in many of the important coal producing states. Their usefulness, however, is impaired by their inaccessibility.

The purpose of this project is to assemble these materials between the covers of one book. It is not possible to foresee all the ways in which this information can be used, but this project should obviously be of concern to many persons beyond academic circles. Individual coal operators will be more likely to base their day-to-day decisions on facts, when those facts can be readily secured. In order to achieve the maximum usefulness, this project must emphasize the

¹⁸ For a detailed description of these data see Ap. I, C.

breakdown of data by states, by divisions, by districts, and by counties. The Committee has already made a preliminary survey to determine the periods covered by the various types of data published by Federal agencies and by many of the state departments of mines. This information will serve as a guide for the development of this source book.

APPENDIX I

Survey of Available Data Pertaining to the Bituminous Coal Industry

THE SECOND specific aim of the Committee was to ascertain what price and related data are being currently collected for the bituminous coal industry. Because of the industry's importance and distinctive characteristics, a large number of Federal, state, and private agencies collect and publish material on prices of coal and on costs, sales realizations, production, and distribution, which are related to prices.

Price data collected currently by the Wholesale and Retail Price Divisions of the Bureau of Labor Statistics and by trade journals, newspapers, and private organizations have received the major attention of the Committee. The survey of these data is presented in Section A.

Data on costs, sales realizations, margins, investments and profits, compiled by such agencies as the Federal Trade Commission, the United States Coal Commission of 1922, the Research and Planning Division of the NRA, and the National Bituminous Coal Commission, and the Bureau of the Census, are described in Section B.

Section C is devoted to a survey of production, distribution, and other related data published by the Bureau of Mines, various state departments of mines, the Federal Power Commission, the Interstate Commerce Commission, the Department of Commerce, and other Federal agencies.

A PRICE DATA COLLECTED CURRENTLY

PRICES COLLECTED BY THE BUREAU OF LABOR STATISTICS

Because of the importance of this industry and because of the multitude of prices arising out of differences in the grades and sizes of coal and the diverse areas in which they are produced and sold the Federal Government alone can assume the task of collecting an adequate sample of coal prices. This obligation has been assigned for many years to the Bureau of Labor Statistics. Since it is interested in both wholesale and retail prices and since the work is carried on by different divisions, the two types of price data from this source are described separately.

a Wholesale Prices¹

The wholesale price work of the Bureau of Labor Statistics dates from the Senate Resolution of March 3, 1891 (52d Congress, 1st Sess.) which instructed the Committee on Finance "to ascertain in every practicable way and to report from time to time to the Senate the effect of the tariff laws upon the imports and exports, the growth, development, production, and prices of agricultural and manufactured articles at home and abroad. . . ." The Honorable Carroll D. Wright, Commissioner of the Department of Labor (through changing titles to the present Bureau of Labor Statistics) was put in charge of collecting and tabulating this great mass of statistics. The results of the inquiry into the course of wholesale prices from 1840 to 1890 were submitted by Nelson W. Aldrich to the Senate Committee on Finance in March 1893 (52d Congress, 2d Sess., Senate Report 1394). The second report, continuing so far as practicable the previous investigation, was issued as Bulletin 27 of the Department of Labor in March 1900. This date marks the real beginning of the compilation of wholesale commodity prices by the Department of Labor (the Bureau of Labor Statistics).

Until 1917 price data were collected and compiled once a year. Reporting agencies were requested early in January to submit representative monthly prices for the preceding year. For commodities subject to frequent price changes the cooperat-

¹ Prepared by Jesse M. Cutts, Chief, Wholesale Price Division, U. S. Bureau of Labor Statistics.

ing agencies were requested to furnish changes in price together with the dates of change. Monthly average prices were calculated for computation of monthly indexes. The report issued in 1900 gives monthly indexes of wholesale prices by groups of commodities back to January 1890. The monthly collection of price statistics was begun by the Bureau in 1917.

Bituminous coal has been represented in the Bureau's wholesale price index since 1890. The data of the Department of Labor were tied in with the series compiled for the Senate Committee and submitted by Mr. Aldrich. This gives representation to bituminous coal in a general index since 1857. Available information warrants only this brief mention of wholesale price series for bituminous coal for the early period of compilation. The first general revision and expansion of the wholesale price series were made in 1920-21. Index numbers were revised back to 1913 to include additional series and to establish the computation of the index on a uniform basis.

Price reporting was monthly until 1932, when the calculation of weekly index numbers was begun by the Bureau. Since 1932 prices, including those for bituminous coal, have been requested as of one day during the week, wherever possible, Tuesday.

Classification

The Bureau uses three classifications of bituminous coal in its computations: mine run, prepared sizes, and screenings. 'Mine run' is, as its name signifies, the coal as it comes from the mines without any further preparation for the market. 'Prepared sizes' denotes coal that has been screened but does not necessarily mean that only one size is included in the Bureau's computations, as reports from one distributor may be on a 2-inch size, from another on a 1½-inch size, and still others may be on sizes with a varying range. Period after period each reporter furnishes price information on a comparable size. 'Screenings' denotes the slack or fine coal that is sifted through the screens in a screening process. It is used principally for industrial purposes.

Types of price

The Bureau of Labor Statistics defines 'wholesale prices' as those obtained in the first commercial transactions. Prior

to 1923 the Bureau used in its index the spot f.o.b. mine prices for designated markets. Since 1923 the prices include freight to destination but exclude brokers' commissions and other known handling costs. Some reporters show separately the f.o.b. mine price and the freight charge from the mine to the city, and the addition of the two factors determines the f.o.b. cars destination price. Other reports show the f.o.b. cars destination price alone. The prices are per ton of 2,000 pounds.

The price of mine-run coal used in the index is an un-weighted arithmetic average of quotations for the selected cities. The same process is followed in determining average prices for prepared sizes and screenings. These average prices are then weighted according to the percentage ratios outlined below for inclusion in the weighted index as a subgroup of the Fuel and Lighting Materials Group and a component part of the index of all commodities.

Weighting factors

In accordance with Bureau practices, representation in the index is based upon the relative importance of bituminous coal in domestic markets. Changes in quantity weighting factors are made periodically because of changes in the relative importance of coal. The value aggregates used in the construction of the weighted index numbers are calculated by applying average market prices to physical quantities marketed during Census years.

Proportionate representation is given to each of the three classifications of coal based on information obtained from the Bureau of Mines and *Coal Age* concerning the relative importance of each classification in domestic markets. At present this ratio approximates: mine run 50, prepared sizes 30, and screenings 20. The quantities marketed include coal sold locally and coal loaded at the mines for shipment by rail and water, long and short distance trucking. To these totals are added imports for consumption. Coal sold for export is not included. The average of quantities marketed for the years 1929-31 was estimated to be approximately 453 million net tons. This total apportioned according to the percentage ratios shown above results in the quantity weighting factors: Mine-run, 227 million net tons; prepared sizes, 133 million net tons; and screenings, 93 million net tons. The present quantity

weighting factors were introduced in the computations in January 1934 (See Table I-1 for quantity weighting factors and periods used).

TABLE I-1

Quantity Weighting Factors Used in Calculating Index Numbers for Bituminous Coal Prices

YEARS FOR WHICH QUANTITIES MARKETING WERE AVERAGED	YEARS FOR WHICH WEIGHTS WERE USED	QUANTITY WEIGHTING FACTORS TONS OF 2,000 POUNDS (000's omitted)		
		Mine run	Prepared sizes	Screenings
1909	1890 to 1912		461,240*	
1909 and 1914	1913 and 1914	186,872	130,810	56,062
1914 and 1919	1915 to 1919	204,862	143,404	61,459
1919 and 1921	1920 and 1921	206,354	144,448	61,907
1921 and 1923	1922 and 1923	231,433	162,004	69,430
1923 and 1925	1924 to 1929	248,122	173,685	74,437
1925 and 1927	1930 and 1931	250,461	175,323	75,138
1927 and 1929	1932 and 1933	253,290	147,837	103,435
1929 and 1931	1934 to 1937	227,354	132,699	92,844

* Total, no allocation by classifications.

Coverage

Prior to 1923 the index was constructed from quotations from recognized trade papers and a few coal brokers and producing companies. Since 1923 prices have been furnished by more mine operators, selling agents, or large distributors in the localities included in the reports. Except for minor adjustments due to bankruptcy, discontinuance of operation, and other causes, the present series have been continued uninterruptedly since 1923. The cities included in the present index, apportioned by kind and number of quotations, are shown in Table I-2. They were selected from the cities used in the Bureau's cost of living index. Representatives of the Bureau of Mines and of the bituminous coal industry were consulted before the cities were finally selected.

Publication

In accordance with the general custom and practice of the Bureau, weekly average prices for bituminous coal are not published in any form. For the last two years monthly average prices have been issued in mimeographed form about the 20th of the month following that to which the data relate. The June

TABLE I-2

Number of Quotations from Each City for Bituminous
Coal Included in the Bureau of Labor Statistics
Wholesale Price Reporting Service

(included in the present weighted index)

CITY	NUMBER OF QUOTATIONS		
	Mine run	Prepared sizes	Screenings
Atlanta, Ga.	2	3	1
Baltimore, Md.	3		
Birmingham, Ala.	2	2	1
Boston, Mass.	1		
Chicago, Ill.	1	1	1
Cincinnati, Ohio	2	1	1
Cleveland, Ohio	1	2	1
Detroit, Mich.	1	2	1
Indianapolis, Ind.	3	2	2
Kansas City, Mo.	1	1	1
Minneapolis, Minn.	3	3	3
New Orleans, La.		1	
New York, N. Y.	2		
Norfolk, Va.	1		
Pittsburgh, Pa.	1	1	
St. Louis, Mo.	2	3	3
(supplementary reports in the Bureau's files)			
Atlanta, Ga.			2
Birmingham, Ala.	3	2	3
Boston, Mass.	1		1
Chicago, Ill.	2	2	2
Cincinnati, Ohio		2	2
Cleveland, Ohio	1		1
Detroit, Mich.	2	1	2
Indianapolis, Ind.		1	
Minneapolis, Minn.		3	
New Orleans, La.		1	
St. Louis, Mo.	1	1	1

and December issues of the monthly pamphlet *Wholesale Prices* show monthly average prices for the six-month period ending with the respective month. Prior to July 1935 each issue of *Wholesale Prices* carried current monthly averages compared with the preceding month and the corresponding month of the preceding year. In addition to the actual average price the reports show index numbers based on the average for 1926 as 100.

Revision

The Wholesale Price Division is engaged in a program of revision and expansion covering every phase of its wholesale price work. Bituminous coal data have not yet been revised partly because the Division has awaited the recommendations of the Committee on Prices in the Bituminous Coal Industry and partly because of more pressing demands for revision of other price series. In Appendix II, A, the Committee's recommendations are reviewed, and although no commitment can be made, it is hoped that wholesale prices of bituminous coal will be revised during the fiscal year 1937-38.

b Retail Prices collected prior to 1937^a

The Retail Price Division of the United States Bureau of Labor Statistics collects, tabulates, and publishes retail prices of bituminous coal together with retail prices of many other commodities. The statistics compiled by the Division are used in the Bureau's retail price series and also to measure price changes for the cost of living index. In the following description of the data published by the Retail Price Division, the Committee has directed its attention solely to bituminous coal series. The discussion is also restricted to the scope of these data and the procedure used in assembling them prior to 1937. Changes during 1937 are described in Appendix II, B.

Scope of data

The number of cities included in the Bureau's retail coal price reports has varied from time to time. From 1923 to 1936

1907-1912	1913-1917	1918-1922	1923-1936
23-24	28-31	39-45	38

retail prices of bituminous coal were collected in the 38 cities listed below. In the 14 cities indicated by an (X), prices were given separately for high and low volatile coal. In the other cities the grade of coal was not designated.

In each of the 38 cities, the quotations on sized coal, ranging from stoker to block, were combined into simple averages under

^a Data for this section were prepared under the direction of Stella Stewart, Chief of the Retail Price Division, Bureau of Labor Statistics.

TABLE I-3

Publication of Retail Prices of Coal and Periods Covered for Series, 1907-16 and 1913-36, inclusive

SERIES, 1907-1916 BULLETIN		SERIES, 1913-1936 <i>Retail Prices</i> (pamphlets) ¹		BULLETIN	
Number	Period covered	Date of issue	Period covered	Number	Period covered
105	1907-1911	October 1918 ²	Jan. 1913-July 1918	270	1913-1919
106	1907-June 1912	March 1919 ³	Jan. 1913-Jan. 1919	300	1913-1920
108	1907-July 1912			315	1913-1921
110	1907-Oct. 1912	and		334	1913-1922
115	1907-Jan. 1913	subsequent		366	1913-1923
125	1907-April 1913	issues covering		396	1890-1924
136	1907-July 1913	dates for which	1913-1936, inclusive	418	1890-1925
138	1907-Oct. 1913	prices were		445	1890-1926
156	1907-July 1914	collected		464	1890-1927
184	1907-Jan. 1915			495	1890-1928
197	1907-July 1915				
228	1907-Dec. 1916				

¹ Published monthly beginning November 1917 (showing prices for September 1917).² First publication of average prices by cities.³ First publication of relative prices for bituminous coal for the United States (cities combined).

the designation 'Prepared Sizes'. In addition, in 7 cities average prices were also published for 'run of mine' coal: Chicago, Detroit, Indianapolis, Baltimore, Norfolk, Richmond, and Washington, D. C.

Middle Atlantic	South Atlantic
Pittsburgh	Atlanta
East North Central	Baltimore (X)
Chicago (X)	Charleston, S. C.
Cincinnati (X)	Jacksonville
Cleveland (X)	Norfolk (X)
Columbus, Ohio (X)	Richmond (X)
Detroit (X)	Savannah
Indianapolis (X)	Washington, D. C. (X)
Milwaukee (X)	East South Central
Peoria	Birmingham
Springfield, Ill.	Louisville (X)
West North Central	Memphis
Kansas City	Mobile
Minneapolis (X)	West South Central
Omaha	Dallas
St. Louis	Houston
St. Paul (X)	Little Rock
Mountain	New Orleans
Butte	Pacific
Denver	Los Angeles
Salt Lake City	Portland, Ore.
	San Francisco
	Seattle

Method of compilation^a

Selected coal merchants who sold directly to household consumers mailed prices of bituminous coal to the Bureau. In April 1936 the number of reporting dealers in each city ranged from 2 to 7 and totaled 163; the number of quotations ranged from 4 to 49 in a city and totaled 752. The average price for bituminous coal in the 38 cities combined was obtained by taking a simple average of all quotations irrespective of grade or size. The majority of the quotations, however, were for lump or egg sizes. Each quotation was identified by a trade name which indicated either the originating mine district or selling company. A special effort was made to ensure the continuity of

^a The first comprehensive statement of method was published by the Bureau of Labor Statistics in Bulletin 270; the latest statement in Bulletin 495.

the various component series with respect to both the reporting dealer and the grades and sizes entering into the average.

Each dealer was originally requested by the Bureau of Labor Statistics to identify the kinds, grades, and sizes of bituminous coal that were important in his sales to household consumers. At each price collection period thereafter, the list of indicated items was typed on the out-going schedules, addressed to the reporting dealer (Figure 1). Substitutes to meet changing consumer demands were made as follows: the price of each discontinued item was interpolated for one period on the basis of the amount of change from the preceding period reported by other dealers in the same city for similar coal. Prices of new items were included in the average only after two successive reports. These precautions were taken to ensure the comparability of the items used for measuring price changes from period to period.

Quotations from new reporters or for different kinds of coal stocked by old reporters were included in the city and United States averages without adjustment of the preceding pricing periods, after they had been received several times and had been checked for reliability and representativeness. Prices in cities that were added to the reporting service after 1913 were included in the averages for all cities combined without adjustment of the preceding pricing periods.

When quotations were omitted from the reports, interpolations were made until it was reasonably certain that the coal was no longer handled by the dealer or was not representative of family trade. If it seemed advisable, a substitute was secured. Reports from firms no longer in a position to furnish data to the Bureau were replaced by reports from other representative firms in the same city. No interpolations were made of quotations from firms that discontinued reporting. Prices quoted by substitute reporters were included in the average as soon as they had been reported a sufficient number of times to demonstrate their reliability.

Sales taxes were added to the prices reported by dealers in cities where such taxes were applicable to retail coal.

Frequency of collection and publication of prices

From 1907 to 1913 retail prices of coal were collected on the 15th of January, April, July, and October; from 1914 to 1920, on January and July 15th; and from June 1920 to July 1935,

monthly on the 15th. In October 1935 it was decided to shift back to a quarterly collection in order to provide the necessary time for studying ways and means of improving the retail coal price series. Average prices in each of the 38 cities were collected and average prices and index numbers for the cities combined were published as of the 15th of January, April, July, and September, and released in *Retail Prices*, the monthly publication of the Retail Price Division. In September 1936 the month used in each quarter was changed to March, June, September, and December. Quotations were secured as of the 15th of the month and published about six weeks later. It has been possible, however, to secure this information on request in about four weeks.

2 PRICES COLLECTED BY TRADE JOURNALS, NEWSPAPERS, AND PRIVATE ORGANIZATIONS

In addition to the Bureau of Labor Statistics, private organizations, many trade journals, and newspapers compile current prices of bituminous coal. It is significant that the work of many of these agencies antedates the original collection of wholesale prices by the Bureau of Labor Statistics. At present there are at least twelve such sources of information including three coal trade journals: the *Black Diamond*, *Coal and Coal Trade Journal*, and *Saward's Journal*; three trade journals in allied industries: *American Metal Market*, *Daily Metal Trade*, and the *Iron Age*; four business and financial journals: *The Annalist*, *The Commercial Bulletin*, *Chicago Journal of Commerce*, the *Journal of Commerce*, and two private bulletins: *The Guaranty Survey* and the *Conference Board Service Letter*. Although *Coal Age* has not published any prices of coal since its issue of October 1931, it is such an important source for data on prices in preceding years that it is also included in this survey. All the principal markets and nearly all the smaller ones were regularly listed in *Coal Age*. No other journal has ever duplicated its coverage or tabulated the prices in so convenient a form.

The data available from all these sources except the *Conference Board Service Letter* are described in Table I-4. The number of quotations of prices in each market usually represents a variety of sizes of coal from various producing fields. The qualities and sizes of coal of greatest significance in each market are usually listed by the journals.

As part of its study of the cost of living in the United States,

TABLE I-4

Sources of Current Prices of Bituminous Coal

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NAME AND ADDRESS OF PERIODICAL	FREQUENCY OF QUOTATIONS	MARKETS FOR WHICH PRICES ARE QUOTED	TYPE OF PRICE QUOTED	NUMBER OF QUOTATIONS
<i>American Metal Market</i> , 111 John Street, New York, N. Y.	Several times each week	Boston, Mass.	Gross tons, on cars at Boston	3
	Several times each week	New England	Net tons, f.o.b. mine	6
	Several times each week	New York, N. Y.	Net tons, f.o.b. mine	11
<i>The Annalist</i> , 239 W. 43d St., New York, N. Y.	Weekly	New York, N. Y.	Net tons, f.o.b. mine	1*
<i>The Black Diamond</i> , Manhattan Bldg, Chicago, Ill.	Irregularly	Birmingham, Ala.	F.o.b. mines	20-42
	Bi-weekly	Bluefield, W. Va.	(f.o.b. mine)	13
	Irregularly	Boston, Mass.	(Gross tons on cars at Boston)	2
	Bi-weekly	Charleston, W. Va.	(f.o.b. mine)	3-8
	Bi-weekly	Chicago & Central West	(f.o.b. mine)	68
	Bi-weekly	Cincinnati, Ohio	(f.o.b. mine)	4-9
	Bi-weekly	Cincinnati, Ohio	Retail	4
	Bi-weekly	Cleveland, Ohio	Wholesale, f.o.b. mine	45
	Irregularly	Detroit, Mich.	Wholesale (f.o.b. mine)	14-18
	Irregularly	Louisville, Ky.	(f.o.b. mine)	12-26
	Irregularly	Memphis, Tenn.	Wholesale (f.o.b. mine)	11-14

APPENDIX I

	Bi-weekly	Minneapolis-St. Paul and Northwest	F.o.b. dock	36
	Bi-weekly	Minneapolis-St. Paul and Northwest	F.o.b. mine	24
	Irregularly	Nashville, Tenn.	Wholesale (f.o.b. mine)	24
	Irregularly	Nashville, Tenn.	Retail	18
	Bi-weekly	New York, N. Y.	(f.o.b. mine)	4-5
	Irregularly	Oklahoma-Texas	(f.o.b. mine)	21
	Bi-weekly	Philadelphia, Pa.	(f.o.b. mine)	4
	Bi-weekly	Pittsburgh, Pa.	F.o.b. mine	14
<i>Chicago Journal of Commerce,</i> 12 E. Grand Ave., Chicago, Ill.	Daily, except Sundays and holidays	Chicago, Ill.	F.o.b. mine	97
		Chicago, Ill.	Retail	51
<i>Coal Age,</i> 330 W. 42d St., New York, N. Y.	Weekly prices, published monthly. No prices published since October 1931	Birmingham, Ala.	Net tons, f.o.b. mine	2
		Boston, Mass.	Net tons, f.o.b. mine	3
		Boston, Mass.	Gross tons, f.o.b. vessel, Hamp- ton Roads	2
		Chicago, Ill.	Net tons, f.o.b. mine	36
		Cincinnati, Ohio	Net tons, f.o.b. mine	33
		Cleveland, Ohio	Net tons, f.o.b. mine	5
		Columbus, Ohio	Net tons, f.o.b. mine	4
		Fairmont, W. Va.	Net tons, f.o.b. mine	5
		Kansas City, Kan.	Net tons, f.o.b. mine	4
		Louisville, Ky.	Net tons, f.o.b. mine	17
		New York, N. Y.	Net tons, f.o.b. mine	6
		Philadelphia, Pa.	Net tons, f.o.b. mine	10

TABLE I-4 (cont.)

Sources of Current Prices of Bituminous Coal

NAME AND ADDRESS OF PERIODICAL	FREQUENCY OF QUOTATIONS	MARKETS FOR WHICH PRICES ARE QUOTED	TYPE OF PRICE QUOTED	NUMBER OF QUOTATIONS
<i>Coal Age</i> (cont.)		Pittsburgh, Pa.	Net tons, f.o.b. mine	8
		St. Louis, Mo.	Net tons, f.o.b. mine	8
<i>Coal and Coal Trade Journal</i> , 21 West Street, New York, N. Y.	Weekly, magazine published bi-weekly	Not specified	Net tons, f.o.b. mine	58
		Hampton Roads, Va.	Gross tons, f.o.b. pier	2
		New York, N. Y.	Gross tons, f.o.b. pier	5
<i>The Commercial Bulletin</i> , 144 High Street, Boston, Mass.	Weekly	Boston, Mass.	Net tons, f.o.b. mine	13
	Weekly	Boston, Mass.	Gross tons on cars, Boston	5
	Weekly	Boston, Mass.	Retail	9
	Weekly	Providence, R. I.	Gross tons on cars, Providence	5
<i>Daily Metal Trade</i> , Penton Publishing Co., Cleveland, Ohio	Daily, except Mondays, Sundays, and holidays	Chicago, Ill.	Net tons, f.o.b. mine	18
		Pennsylvania	Net tons, f.o.b. mine	6
<i>The Guaranty Survey</i> , Guaranty Trust Co. of New York New York, N. Y.	Monthly	N. Y., Pa., Ohio, Ind., and Mich. combined	Net tons, f.o.b. mine	2
<i>The Iron Age</i> , 239 West 39th Street, New York, N. Y.	Weekly	Pittsburgh, Pa.	F.o.b. mine	6
<i>Journal of Commerce</i> , 63 Park Row, New York, N. Y.	Complete list weekly, some prices daily	Baltimore, Md.	Gross tons, f.o.b. pier	1
		Charleston, S. C.	Gross tons, f.o.b. pier	1
		Chicago, Ill.	Net tons, f.o.b. mine	5

		Galveston, Texas	Gross tons, f.o.b. pier	1
		Gulfport, Miss.	Gross tons, f.o.b. pier	1
		Hampton Roads, Va.	Gross tons, f.o.b. pier	1
		Hampton Roads, Va.	Net tons, f.o.b. mine	3
		Mobile, Ala.	Gross tons, f.o.b. pier	1
		New Orleans, La.	Gross tons, f.o.b. pier	1
		New York, N. Y.	Gross tons, f.a.s.	1
		New York, N. Y.	Net tons, f.o.b. mine	4
		New York, N. Y.	Retail	1
		Pensacola, Fla.	Gross tons, f.o.b. pier	1
		Philadelphia, Pa.	Gross tons, f.o.b. pier	1
		Pittsburgh, Pa.	Net tons, f.o.b. mine	5
		Savannah, Ga.	Gross tons, f.o.b. pier	1
<i>Saward's Journal</i> , 15 Park Row, New York, N. Y.	Weekly	Boston, Mass.	(on cars at Boston)	4-6
	Weekly	Boston, Mass.	(f.o.b. mine)	1-4
	Weekly	Hampton Roads, Va.	F.o.b. pier	1
	Weekly	New York, N. Y.	(f.o.b. mine)	10
	Weekly	Norfolk, Va.	(f.o.b. mine)	23-30
	Weekly	Philadelphia, Pa.	(f.o.b. mine)	9
	Weekly	Pittsburgh, Pa.	F.o.b. mine	18
	Irregularly	Providence, R. I.	(on cars at Providence)	4

NOTE: When the type of price quoted was not mentioned in the journal, the Committee has stated in parentheses its interpretation of the type of price quoted.

* In July 1937 *The Annalist* discontinued its collection of one quotation for bituminous coal and substituted "a composite of nineteen price series, covering the more important fields, . . . based on quotations published in *The New York Journal of Commerce* and *Saward's Journal*" (Winthrop W. Case, *The Annalist Index of Wholesale Commodity Prices Revised and Improved*, *The Annalist*, July 9, 1937, p. 45).

the National Industrial Conference Board collects retail prices of bituminous coal sold for household use. In the *Conference Board Service Letter*, issued monthly, an index of coal prices including both anthracite and bituminous is published. More detail is given in the studies of the Board such as *The Cost of Living in the United States in 1914-30* and in *1914-36*. These volumes contain a monthly index of the retail prices of bituminous coal in the United States beginning in December 1925, for March, July, and November of each year 1919-25, inclusive, and for July 1914. In addition, indexes of retail prices of bituminous coal for selected cities are shown for one month of each year. For some localities the data begin in 1919.

a Types of Price

Most of the prices quoted in these journals consist of two types of wholesale price. Most of the wholesale prices are f.o.b. the mines, but for certain sections of the country prices at destination are frequently given, especially for coal that is delivered by a combination of rail and water to New England and to Minneapolis-St. Paul and certain other northwestern markets where coal is frequently sold f.o.b. docks, as well as for bunker coal, which is usually quoted f.o.b. piers.

A few journals publish retail prices. *The Chicago Journal of Commerce* covers intensively the retail market in Chicago. *The Commercial Bulletin* quotes 9 prices at retail in Boston. The *Journal of Commerce* has a retail price in New York, and the *Black Diamond* occasionally quotes retail prices in Cincinnati and Nashville.

b Availability of Price Data

These many data on current prices of bituminous coal are, unfortunately, not readily available. In general the journals that collect prices of bituminous coal do not publish summaries or even maintain any file of prices in their offices. As a result, it is usually necessary to consult each issue in order to secure a continuous series of prices. The chief exception is *The Annalist*, which has the prices from 1928 to date summarized in its office; the data from 1923 to 1928 are not so readily available. In addition, its files contain prices for two series of coal that are not published currently. A few of the series published by *Saward's Journal* are summarized in *Saward's Annual*. The annual edi-

tion of the *Chicago Journal of Commerce* carries a monthly tabulation of coal prices during the year. *Coal Age* formerly followed a similar practice for some of its series.

c Method of collecting Quotations for Bituminous Coal

The method generally used to secure quotations on various grades and sizes of coal is for the reporter or correspondent to call or visit a few outstanding coal companies and ask what the prevailing prices are. Sydney Hale, editor of *Coal Age*, emphasized the fact that the reliability of the reported prices of bituminous coal depends upon the reporter. The accuracy of his quotations is largely dependent upon his judgment, the number of his contacts, and his ability to find persons who will quote reliable prices. H. A. Lindenberg of *The Commercial Bulletin* commented:

"Our information is secured in the only way possible where a commodity is not sold over an exchange, that is by daily contacts with friends among coal buyers and sellers, including wholesalers, retailers, and mine representatives. It is only possible to do this at all well after one has built up friendships, using tact, intelligence, and a willingness to swap information to obtain satisfactory information. No matter how clever a daily newspaper reporter, or how serious a statistical expert, he will flounder in securing accurate coal prices unless he knows on whom he can rely for trustworthy facts. The only way we know is by experience, over a space of years. Our friendships in all trades are our 'stock in trade'."

The various quotations received by a reporter may be summarized by giving a range of prices. The late E. I. Koontz of the *Journal of Commerce* pointed out that a range in price may indicate also slight differences in grading and specifications.

Opinion seems general that little if any coal is sold for as much as the quotations published by the journals. First, the quotations are of spot rather than contract prices. Second, a distinction must be made between 'asking prices', which are given to the reporters, and 'selling prices', which may differ slightly for each sale. Finally, it is necessary to discount a bias for high prices. At least one reporter has a definite policy of quoting above the market in order to aid in maintaining the price level. That two journals quote identical prices for the same grade of coal in a market does not necessarily prove the

accuracy of the quotations, for the same reporter is sometimes used by non-competing papers.

B COST, SALES REALIZATION, MARGIN, AND INVESTMENT DATA

There are no continuous series of data pertaining to costs of production, sales realization, margins, and investment. Information has been collected only at irregular intervals and almost entirely by Federal agencies or by agencies provided for by Federal legislation, as under the Bituminous Coal Code. An important exception are the cost and sales realization data compiled by the National Coal Association for 1919 and 1920.

1 COST, SALES REALIZATION, AND MARGIN DATA

The important studies of production costs, sales realizations, and margins were made by the Federal Trade Commission, the National Coal Association, the United States Coal Commission of 1922, and the Research and Planning Division of the NRA. Additional cost and sales realization data were compiled by the National Bituminous Coal Commission established under the Bituminous Coal Conservation Act of 1935, from figures submitted to it by district boards, but this information has not been made available for public use.

a Federal Trade Commission

Pursuant to directions from Congress, the Federal Trade Commission collected and published costs and sales realizations by districts, states, and general competitive regions for 1916, 1917, and 1918. It began to collect comparable data in 1920 but stopped in July when the number of returns fell off because an injunction prohibiting the requiring of cost reports was obtained by the Maynard Coal Company against the Commission. The data for the first six months of 1920 were published in monthly reports of the Commission.

The nature of the information collected, the timing, and the coverage are shown in Table I-5. Prior to August 1917 the data are based on sworn reports submitted by operators in support of applications for revision of official selling prices or were obtained directly from the operators' books by the Commission's agents. The information from August 1917 to December 1918, inclusive, was obtained from monthly reports by the operators

on the detailed schedules prescribed by the Commission. The information is of two kinds: 'Claimed costs' and 'Revised costs'. The basis of the revision as described by the Commission follows:

"The 'claimed costs' are compiled from the original figures which appear on the operators' reports. The 'revised costs' are compiled from such reports, after the 'claimed costs' were revised by the accounting staff of the commission in order to readjust monthly costs and to eliminate inflated costs. As example of the first kind of revision may be mentioned the prorating, over several months, of payments for supplies, insurance, taxes, etc., made in some one month, but which apply to several months' operations. There were also a few instances of obviously inflated costs. The obvious inflations on the monthly cost reports were detected through the comparison of the costs of such operators, either with their own previously reported costs, or with costs of the other operators operating under similar conditions. In each case the operator was given opportunity to furnish a supplementary statement showing the principal items making up the cost item which was questioned, and on the basis of such detailed information the revision was made by the commission's accountants.

"It is with full appreciation of the patient cooperation of the great majority of operators, the honesty and the accuracy of whose cost reports are not open to question, that the commission is able to point out that the cost of from 90 to 95 per cent of the tonnage reported could be accepted as substantially correct. Certain revisions were found necessary, however. Sometimes they operated to reduce costs, and at other times they increased them.

As will be seen from an examination of the tables and charts appearing in this report, showing a comparison of 'claimed' and 'revised' costs, the revision made by the commission had little appreciable effect on the costs shown. Most of the revision occurs under 'General expense', where most of the inflation was found to have taken place." ⁴

The cost data do not include any of the following items: "Reserves for uninsurable hazards, such as mine fires, floods, cave-

⁴ *Report of the United States Coal Commission* (Washington, Government Printing Office, 1925), Part IV, p. 2,028.

TABLE 1-5
Cost, Sales Realization, and Margin Data for the Bituminous
Coal Industry available in Published Reports

PERIOD	COMPILER	TIMING	COVERAGE			Percentage of total output	NATURE OF DATA
			No. of mines or operators	No. of districts or fields	Approximate production (in thousands)		
1916, 1917, and 1918	Federal Trade Commission	1916, annual; 1 1917 and 1918 by month and year	291 operators	30 out of 74 districts	119,755	20.7 per cent of 1918 output	Per ton labor, supplies, general expense, and total f.o.b. mine costs, sales realizations, and margins
Aug. 1917 to Dec. 1918, incl.	Federal Trade Commission	Varying monthly combinations	632 to 801 operators	43 out of 74 districts	122,715 in 1918	21.2 per cent of 1918 output	Total f.o.b. mine costs, sales realizations, and margins
1918	Federal Trade Commission	By quarters and for year	4410 mines	74 (all districts)	497,316	86	Per ton labor, supplies, general expense, and total f.o.b. mine costs, sales realizations, and margins
1916, 1917, 1918, 1921, and 1922	U. S. Coal Commission	By year; 1922 by quarters also	217 operators	31 out of 92 fields	89,632 in 1918 57,883 in 1922	14 in 1918 15.8 in 1922	Per ton labor, supplies, general expense, and total f.o.b. mine costs, sales realizations, and margins

1918, 1921, and 1922	U. S. Coal Commission	1918, for year; 1921 and 1922, by quarters and for year	1,180 operators	83 out of 92 fields	372,152 in 1918 262,795 in 1921 237,786 in 1922	65.7 in 1918 64.7 in 1921 57.4 in 1922	Per ton labor, supplies, general expense, and total f.o.b. mine costs, sales realizations, and margins
1919, and 1st 9 months of 1920	U. S. Coal Commission *	1919 for year; 1920, Jan. to Mar. and Apr. to Sept.	264 operators	45 out of 92 fields	86,554 in 1918	15 per cent of 1918 output	Per ton labor, supplies, general expense, and total f.o.b. mine costs, sales realizations, and margins
1921 and 1922	U. S. Coal Commission	By month and for year	1,747 operators	86 out of 92 fields	321,677 in 1921 295,089 in 1922	77.3 in 1921 69.9 in 1922	Per ton labor, supplies, general expense, and total f.o.b. mine costs, sales realizations, and margins
Nov. 1933 to Jan. 1935, incl.; for some fields data available for 1 to 5 months only	Research and Planning Division, NRA	By month and combinations of months	No. varies for different periods	No. varies for different periods	Production varies for different periods	71.2 for Nov.-Dec. 1933; 65.8 for Jan.-Mar. 1934, and 61.2 for April 1934-Jan. 1935	See text, Ap. I, B. 1, c

* For six districts data for 1916 are not complete for the year.

* Data were originally obtained by a Senate committee (Calder Committee) from the files of the National Coal Association.

ins, squeezes, strikes, or other similar causes contributing to destruction of property, and idleness at the mines; extra cost development work done during the war, and involving an increased risk in the amortization of the capital under a normal regime of prices of coal; selling expenses, where a selling organization, other than the mine office force, is maintained in order to market the product; interest on the investment; allowances for income and excess-profits taxes, gross and net profit on the investment." ⁵

Table I-5 shows that the data for 1918 on costs, sales realizations, and margins represented substantially the entire industry, but covered in 1916 and 1917 only about one-fifth of the 1918 production. The Commission "believed that a sufficient proportion of the companies was covered in 1916-17 to be representative at least of the particular districts in which the companies then covered are located." ⁶

b United States Coal Commission

The United States Coal Commission collected cost and sales realization data from 2,399 operators who operated mines in 86 fields and produced approximately 77.3 per cent of the total bituminous coal output in 1921 and 69.9 per cent in 1922. In addition to the information collected by its staff, the Commission made use of the data collected by the Federal Trade Commission and those obtained from the files of the National Coal Association, by the Select Committee on Reconstruction and Production of the United States Senate (66th Cong., 3d Sess.), often known as the Calder Committee.

From these data the Commission was able to compile the costs, sales realizations, and margins for 217 identical operators in 11 states for 1916, 1917, 1918, 1921, and 1922, and for 83 of these operators for 1919 and the first three quarters of 1920. It also published similar information for 1,180 operators in 23 states for 1918, 1921, and 1922, and for 264 of these operators for 1919 and the first nine months of 1920. The type of data, the timing, and coverage are shown in Table I-5.

⁵ *Cost Reports of the Federal Trade Commission, Coal*, No. 1 (Government Printing Office, Washington, 1919), p. 5.

⁶ *Investment and Profits in Soft-Coal Mining* (Government Printing Office, Washington, 1922), p. 22.

The data for 1921 and 1922 were obtained from reports by the operators on schedules prescribed by the Commission. The information was certified by a responsible official of the company. For 1919 and 1920 the information was taken chiefly from the work sheets of the Calder Committee which had originally been computed by the National Coal Association from uncertified reports submitted by the operators. The Commission regarded this information as "substantially reliable". The data, which were not revised, did not show separate costs for labor, supplies, and other expenses. The Commission, however, was able to allocate these items of cost by making use of the information collected by the Federal Trade Commission for the first six months of 1920 (see preceding section, a).

The statistics from all sources on costs of labor and of supplies are strictly comparable, but not those on general expenses and total f.o.b. mine costs. The Coal Commission data for these items do not agree with those of the Federal Trade Commission because different bases were used in reporting depletion and depreciation charges. "Under the Federal Trade Commission's rules, when any operator was found to have returned depletion and depreciation charges based on values in excess of his original investment, such charges were 'revised' or cut down to his 'original costs', or to the general average of the field, if 'original costs' could not be secured. In the case of the United States Coal Commission reports the operator was asked to report the depletion and depreciation charges actually carried on his books. These were usually based on the Treasury ruling governing such charges, and were tabulated by the Coal Commission as reported." ¹ A test tabulation made by the Coal Commission disclosed that its total per ton f.o.b. mine costs, owing to differences in the bases used in determining depletion and depreciation charges, were four cents higher on the average than similar costs computed under the Federal Trade Commission's ruling. The total f.o.b. mine costs did not include "allowance for the use of capital invested, whether owned by the operator or in the form of borrowed funds".

Sales realizations published by the Coal Commission, except the data of the Calder Committee, were "obtained by dividing the tonnage of coal sold into the total amount received for its sale, less selling expenses reported by the operator. This applies

¹ *Report of the United States Coal Commission, Part IV, p. 2,029.*

to all statistics of sales realizations, whether derived from Federal Trade Commission or United States Coal Commission sources. This method differs from that used in arriving at the sales realizations shown in the published Federal Trade Commission reports in which there was no deduction of selling expenses."⁸ Sales realization obtained by the Calder Committee was "gross sales realization before deducting selling commission", while the figures published by the Coal Commission are 'net' after deducting selling expense.

The 'margin', which is the difference between the sales realization per ton and the f.o.b. mine cost per ton, "is practically equivalent to net operating income before the payment of interest or Federal taxes". The margins shown by the Coal Commission for 1919 and subsequent years are strictly comparable. Because different methods were used in reporting depletion and depreciation charges, the Coal Commission's original data are not comparable with those of the Federal Trade Commission or even with data derived by the Coal Commission from the Federal Trade Commission's files.

c Research and Planning Division, NRA

Pursuant to the provisions of the Bituminous Coal Code, the Bituminous Coal Section of the Research and Planning Division of the NRA collected among other data detailed information pertaining to costs and sales realizations. Most of it is available on a monthly basis from November 1933 through January 1935 for 55 fields or seam groups producing approximately 61 per cent of total output. For 25 additional fields, most of which are west of the Mississippi River, the data are shown for varying periods, usually from three to five months, November 1933 to March 1934. The total coverage for all districts as a percentage of total production, was 71.2 for November-December 1933, 65.8 for January-February-March 1934, and 61.2 for April 1934 to January 1935. The original data were collected on monthly schedules from mines, other than captive mines, producing 150 tons or more per month.

Those responsible for the collection and compilation of the information made every effort to ensure its reliability. The forms and the general instructions were prepared by statisticians, accountants, engineers, and executives, several of whom

⁸ *Ibid.*, p. 2,031.

had had long experience in the industry. These forms and instructions were reviewed and criticized by a large number of mine accountants and operating executives. To avoid misunderstandings and misinterpretations, training classes were held at accessible cities for those who were to fill in the forms for the individual mines and companies. Detailed instructions were drawn up to supplement the general instructions as questions arose in connection with the preparation of the data at the mines. All figures were certified by a responsible official of the company submitting them. When filled in the forms were forwarded to the offices of the Divisional and Sub-divisional Code Authorities and, when necessary, referred back to the mine for correction. The data contained on these forms were transferred at the offices of the Code Authorities to standard work-sheets prepared by the statisticians of the Bituminous Coal Code Section. When the basic data were received by the Bituminous Coal Code Section, they were edited again with the utmost care and in many instances items were referred back to the Code Authorities for verification and correction. In certain instances, the Washington office sent an expert accountant to spot-check the information reported. The data on forms that met the tests laid down by the Bituminous Coal Code Section were then compiled by seam group, subdivisions, and divisions.

The published volumes contain an invaluable body of data.⁹ In addition to sales realization and margin data, per ton costs are available for the following items:

- 1) Total labor cost
 - a) Daymen (paid by hour, day or month)
 - b) Mining (piece- and day-workers)
 - c) Yardage and deadwork
 - d) Mine supervisory and clerical workers
- 2) Total mine supplies
 - a) All supplies (except power and fuel)
 - b) Power purchased
 - c) Mine fuel at preceding month's cost
- 3) Total mine labor and supplies

⁹ The basic data were published in four folios by the Research and Planning Division of the NRA. The information was partly summarized in *Economic Survey of the Bituminous Coal Industry under Free Competition and Code Regulation*, by Berquist and Associates (National Recovery Administration, Division of Review, March 1936).

- 4) Other mine expenses
 - a) Salaries and expenses of other employees distributed to this mine
 - b) Mine office expense (not elsewhere reported)
- 5) Charges usually on a fixed lump-sum basis
 - a) Taxes on mine property and equipment and other taxes in lieu thereof (except on unassigned acreage)
 - b) Insurance (all classes except compensation)
 - c) Company house expense including fixed charges thereon, less income
 - d) Depreciation (as per calculation for income tax return)
- 6) Total mine expenses and charges usually on a fixed lump-sum basis
- 7) Charges usually on a per ton basis
 - a) Royalties paid or accrued
 - b) Operators' association dues and assessments
 - c) Compensation insurance paid or accrued
 - d) Code authority expense
 - e) Depletion (as per calculation for income tax return)
- 8) Total producing cost
- 9) Total selling expenses
- 10) Total administrative expenses
- 11) Total cost per ton

Additional data pertaining to labor and supply costs for working days, idle days, and Sundays and holidays "provided a basis for projecting costs as reported for the number of days actually worked in any month to an estimated or approximate cost if the mines in the group had worked different numbers of days during the month".¹⁰

The cost information is available by seam groups, subdivisions, and divisions. For each classification the tables show the number of mines, the number of days the tippie started, the number of working days the tippie was idle, the number of holidays and Sundays, and the total net tons produced.

The cost data do not include capital charges (interest on bonds, mortgages, etc.), costs of activities not directly related or pertinent to coal mining operations, carrying charges and taxes for unassigned acreage (reserve acreage not a part of

¹⁰ Berquist and Associates, *op. cit.*, p. 553.

operating reserves of active mines), and taxes on income or sales taxes not paid by the producer.

To obtain an average sales realization per ton of coal the Bituminous Coal Section collected detailed income and production figures for: (a) orders and contracts, (b) shipments to storage, (c) coal forwarded to beehive ovens and briquetting plants, (d) sales at mine to dealers and retail customers (including house coal), (e) net change in inventory (coal used at the mine for power or heat). The total sales realization for these items was divided by the total production involved.

In order to show separately the tonnage and the realization pertaining to contracts made prior to the Code, and those pertaining to orders received after the Code became effective, the Bituminous Coal Code Section collected also for November and December 1933 detailed monthly information on the tons shipped to, and income received by sizes from, each different price zone.

d National Bituminous Coal Commission

The National Bituminous Coal Commission was established under the Bituminous Coal Conservation Act of 1935. This Act required code members to report all spot orders to the district boards, and upon the request of the Commission to file with it all copies of contracts, invoices, credit memoranda, and other information concerning the preparation, cost, sale, and distribution of coal. District boards were empowered to set up statistical bureaus under their own jurisdiction. Individual mines reporting to these district boards or their statistical bureaus were protected by provision for confidential treatment of their data. It was not intended that the Commission should take possession of the individual mine reports. The Commission, however, was to be furnished summary figures compiled from the mine reports by the several district boards. Under the circumstances, the data that had been received and were under study at the time of the Supreme Court decision which terminated all price provisions are not available for public use. The short time before the Supreme Court decision precluded steps by the Coal Commission to audit cost statements or other statistical data.

It is not known whether the cost, price, and distribution data resting in the already disorganized statistical bureaus set up

under the old law will ever become available for study or whether the district summaries of these reports as submitted to the Coal Commission will be opened for public use.

The Bituminous Coal Act of 1937 created a new National Bituminous Coal Commission which is authorized to require code members to report all spot orders and to file with its statistical bureau "copies of contracts for the sale of coal, copies of all invoices, copies of all credit memoranda, and such other information concerning the preparation, cost, sale, and distribution of coal as the Commission may authorize or require".¹¹ Since the life of the Commission is four years, it is conceivable that for these years a continuous series of cost, sales realization, and margin data may be made available for the use of the industry, economists, and students of coal.

e United States Bureau of the Census

The Bureau of the Census in its decennial reports for mines and quarries publishes data on salaries, wages, supplies, fuel, purchased electric energy, contract work, and expenditures for development, as well as the value of all products and coal produced. Prior to 1929 this information was compiled for the industry as a whole, by states, and by major geographic provinces and regions. The data for 1929 are available for the industry, by states, and by coal producing counties.

In 1935 the Bureau of Mines in cooperation with the Bureau of the Census gathered information on the cost of supplies and materials, fuel, and purchased electric current and the total compensation of: (a) proprietors and firm members, (b) salaried officers of corporations, (c) supervisory and technical employees, (d) other salaried employees, (e) wage earners.

These data, notwithstanding certain differences in the scope and form of presentation from census to census, are essentially similar and may be used to show changes and trends in the industry. They are not, however, comparable with the more elaborate studies referred to above.

¹¹ *National Bituminous Coal Act of 1937*, Public No. 48, 75th Cong. (Ch. 127, 1st Sess.) HR 4985, p. 6.

f United States Bureau of Mines

The Bureau of Mines compiles annually the total mine value of bituminous coal produced and the average value per ton at the mines f.o.b. cars, for the industry as a whole and for important coal producing states and counties. From time to time it gives this information also for major producing fields and areas. It publishes these data in its annual reports or in its weekly coal reports. The average value per ton are available for the industry as a whole as far back as 1880.

The following paragraphs give the methods used in compiling and preparing the data and state the limitations of the published figures:

"The value given is the amount received at the mines f.o.b. cars minus the selling expense, and the average value per ton is the average amount received, obtained by dividing the total value by the number of tons sold or produced. Coal used at the mines, coal coked by the producing company, and coal used in some other industry by that company—in all, forming a considerable part of the total output—is not sold, and the value placed upon it is either an estimate or the amount at which it is carried on the company's books. Either value is presumably the amount the coal would have brought if it had been sold or the amount other fuel for the purpose stated would have cost if it had been purchased. In other words, the values given represent returns to the operators for coal sold plus the estimated value of that not sold. The value thus fixed is more or less arbitrary and does not necessarily represent the current prices for coal sold commercially. Many mines are owned by consumers who take all or a great part of their output at nominal prices. The output of such 'captive' mines was 22.7 per cent of the entire production in 1926. In 1929, for example, the average value reported by 'captive' companies was \$1.99 a ton, or considerably more than that reported by the commercial companies, which was \$1.72. Even where the coal is actually sold large quantities may be moved on 'cost plus' contracts that provide for prices below the average spot prices in the field or the average prices received for coal delivered under ordinary contracts. The figures . . . , therefore, do not necessarily show prices on the commercial market or even an average of the prices at the mines. Taken

over a period of years, however, they do furnish a faithful index to the rise and fall in the value of coal.

The computed 'average value per ton' is thus affected by the value placed by the operator upon coal used at the mine but not shipped. In order to ascertain how large an influence the inclusion of this noncommercial coal might have upon the average, the operators were requested for several years to give separate statements of value for coal loaded at the mines for shipment, for sales to local trade, and for mine fuel and coal made into beehive coke. It was found, however, that for practical purposes the average value of all the coal produced may be accepted as a measure of the average value of the coal shipped. The values placed by operators on mine fuel and upon the coal coked were generally somewhat less than the average amounts received for the coal shipped, but the quantities to which these lower values applied were so much smaller than the quantity shipped that their effect upon the average for all coal was negligible."¹²

g State Departments or Bureaus of Mines

When data by mines are needed the yearly figures of average value per ton published by various state departments of mines are especially useful. But the data published in many of these reports must be carefully scrutinized. Some of the reports have been carelessly assembled. In many instances the methods by which the data were prepared are not stated, and unweighted averages are not uncommon. Many of the data made available by these agencies are published in more usable form in United States Bureau of Mines reports.

2 INVESTMENT AND PROFIT DATA

Investment and profit information was compiled and published by the Federal Trade Commission for 1916-21 and by the United States Coal Commission for the decade 1913-22. Investment data were also collected by the National Coal Association for 1919 and 1920. The Association's figures were based on incomplete schedules and the invested capital included capital invested by the company in outside businesses not connected with the coal industry.¹³

¹² Tryon, Mann, and Rogers, *Coal in 1930*, pp. 645 and 646.

¹³ *Investment and Profits in Soft-Coal Mining*, pp. 34-37.

a Federal Trade Commission

The Federal Trade Commission collected and published investment data as of December 31, 1919 for 1,126 companies (producing approximately 32 per cent of the country's average annual output) in 70 of the 74 mining districts of the country as classified by the Fuel Administration. The Commission excluded outside investments in securities and in properties not related to the coal mining business but included undeveloped reserves of coal lands. The investment data include: "Capital stock; bonded indebtedness, mortgages and secured loans; long and short term notes payable; amounts due affiliated companies for current accounts, notes or loans payable; surplus;—less outside investments in Liberty bonds or other securities, and less securities of affiliated companies including current accounts, notes, or loans receivable from affiliated companies." ¹⁴ 'Net margin' as defined by the Commission is the difference between cost of production and sales realization, less the actual selling expense. It is equivalent to net operating revenue before payment of interest or Federal taxes. These net margin data differ from the 'margin' figures published in the Coal Cost Reports of the Commission in that the latter included actual selling expenses.

The Commission's investment data were derived from detailed balance sheets which it secured from the operators on its own forms. From these data the Commission published the investment per ton, net margin, and the approximate rate of net income by regions, states, districts, and the country as a whole. The rate of net income for all years reported is based on the net investment as of December 31, 1919. For 1916–20 the data cover 787 companies in 30 districts and for 1918–21, 1,126 companies in 70 districts. The cost and margin information used in this report was collected in part by the Commission and in part by the National Coal Association. The Commission gathered data for 1916, 1917, 1918, and for six months of 1920, and the National Coal Association for 1919, 1920 (January to September, inclusive), and 1921. The Association's figures were unrevised. Both the investment and the cost and margin data of the Commission were revised.

¹⁴ *Ibid.*, p. 23.

In discussing the validity of the data in its report, the Commission wrote:

"The Commission believes its investment group is representative. Its margin group for 1918 is unquestionably so, covering practically all important concerns; its margin group for 1916-17 has been found representative by test, with certain local exceptions that are noted. As for the margin groups for which the National Coal Association collected reports (1919, 1920, and 1921), the officials of the association, by use of the figures as showing results of the 'bituminous coal industry' and by testimony or published statement, have expressed their belief in the representativeness, broadly at least, of their data.

The data, while incomplete and only partially verified, may be taken as probably showing an understatement of the rate of net income in the soft coal mining industry for this period. The unrevised costs and margins collected by the National Coal Association and the rates derived therefrom are not vouched for by the commission in any way, and they must be considered merely as the best available under the circumstances. The inquiry has not covered profits of selling companies, though in some instances it is known that these are owned by or affiliated with the same interests that mine the coal." ¹⁵

b United States Coal Commission

The United States Coal Commission collected information for investment and profits on prepared schedules which were filled out and sworn to by bituminous coal operators. Data for 88 operators who produced about 15 per cent of the country's output were published for the decade 1913-22. Similar information was published for 175 operators, mining approximately 30 per cent of total output, for 1918-22, and for 215 operators, producing from 31 to 38 per cent of total output for 1920, 1921, and 1922. Only operators whose average annual production was 250,000 net tons or over were included.

The investment figures per ton were obtained "by dividing the production tonnage into the total amount of money involved in the coal-production operations, whether invested by the stockholders or borrowed on notes or bonds from outside sources".¹⁶ The figures of 'net income' are those derived solely

¹⁵ *Ibid.*, p. 3.

¹⁶ *Report of the United States Coal Commission*, Part IV, p. 2,519.

from coal operation before any deductions for Federal taxes.

The data were compiled directly from the information supplied by the operators on the prescribed forms. While the Commission carefully edited the schedules for inaccuracies and omissions, it made no revisions "in the figures reported by the operators as 'book values' with a view to altering in any way the effect produced either by appreciated or decreased values of assets thus represented", nor were the net income figures "adjusted to modify what various advocates might consider either excessive or insufficient charges for depletion, depreciation, or amortization of property accounts".¹⁷

The information, which includes total assets, net income, stockholders' equity and net income, total investment in coal operations and net income, outside investment and income, borrowed funds and interest paid, surplus arising from revaluation of property assets, depletion and depreciation reserves, Federal income and excess profit taxes, and capital stock and dividends, is given for 16 field groups and for 5 geographic regions. It was impracticable to give separate figures for each mining field.

C OTHER RELATED DATA COLLECTED CURRENTLY OR PERIODICALLY

In surveying the data that have a bearing on the prices of bituminous coal, one is confronted with a mass of statistics compiled by many Federal and state agencies. Their publication in numerous bulletins makes it impossible at this time to give for each series its description, timing, period covered, and compiler. For this reason only the important statistics that are published as continuous series by certain of the outstanding sources of information are described. Of the sources considered in this Section, the Bureau of Mines ¹⁸ is of inestimable value.

¹⁷ *Ibid.*, p. 2,517.

¹⁸ Prior to 1924 the service was rendered by the Geological Survey, Department of the Interior. On July 10, 1937 the statistical service for bituminous coal was transferred to the National Bituminous Coal Commission. The service to be rendered by the Commission includes "rapid-fire measurement of trends of all the factors of the market—production, consumption, stocks on hand, distribution, exports, imports and price movements. To give a background for current changes, the long-time trends will also be developed to show demand, capacity, mechanical equipment, operating practice, employment and running time" (National Bituminous Coal Commission, Release No. 30, July 10, 1937).

A second important source, because of its completeness, is the Census of Mines and Quarries. Other Federal sources are the Interstate Commerce Commission, the Federal Power Commission, the Bureaus of Foreign and Domestic Commerce, of Internal Revenue, and of Labor Statistics, which in addition to retail and wholesale prices compiles data on employment, payrolls, employee hours, earnings, and wages.

1 UNITED STATES BUREAU OF MINES

For many years the Bureau of Mines has collected data on the quantity and value of production, labor, consumption, distribution, stocks of coal held by consumers, and equipment and methods of mining and preparation. The production figures published by the Bureau are summarized in Table I-6. The data on total value of production and average value per ton at the mines f.o.b. cars were described under Section B. The following paragraphs discuss briefly the other important continuous series made available by the Bureau.

a Labor Statistics

The basic statistics on labor deal with number of employees, length of working day, strikes, suspensions, and lockouts, accidents, average days worked by bituminous mines, and average output per man per day. The data on the total number of employees go back to 1890 and those for important occupational groups to 1920. The number of employees at mines engaged in stripping operations are available since 1914 and data for certain occupational groups at strip mines since 1923. The estimated number of working days per week have been published since 1919 and the length of the working day measured in terms of mine time and not the hours actually worked by the men since 1903 except for 1908 and 1909. The statistics on strikes, suspensions, and lockouts and the average number of days lost on account of strikes are available since 1899. The number of fatal accidents for certain states go back to 1839 and more detailed data on causes of accidents, including also non-fatal accidents, have been published for later years. The average days worked each year by bituminous mines are available for the country as a whole since 1880, by states since 1890, and by counties since 1899. Similar information for mines engaged in

TABLE 1-6

Data on Production Compiled by the United States
Bureau of Mines

DESCRIPTION	ANNUAL PRODUCTION		
	TOTAL UNITED STATES	BY STATES	BY COUNTIES
Total ¹	1822-	1822-	1895-
Loaded at mines for shipment	1889-	1889-	1899-
Sold to local trade and used by employees	1889-1931	1889-1931	1899-1931
Trucked to distant points	1932	1932	1932
Sold to local trade, used by employees, and nearby trucking	1932	1932	1932
Commercial sales by truck or wagon	1933-	1933-	1933-
Other sales to local trade, or used by employees, or taken by locomotives at tipple	1933-	1933-	1933-
Used at mines for power and heat	1889-	1889-	1899-
Made into coke at mines	1889-	1889-	1899-
Stripping operations ²			
Total strip pits, all types	1914-	1914-	1923-
Total from mines combining stripping and underground methods	1914-	1914-	1923-
Per man per day from mines combining stripping and underground methods	1914-	1914-	1923-
Average per shovel from strip pits	1914-	1914-	1923-
Total from power strip pits proper	1914-	1914-	1923-
Average per man per day at mines combining power stripping and underground methods	1914-	1914-	1923-
Total from horse stripping operations	1922-		
Average per man per day from mines combining horse stripping and underground methods	1922-		
Underground mining			
Total underground	1928-	1928-	
Per man per year underground	1928-	1928-	
Per man per day underground	1911-	1911-	

ANNUAL PRODUCTION (Cont.)

DESCRIPTION	TOTAL UNITED STATES	BY STATES	BY COUNTIES
Type of equipment			
Total mined by undercutting machine underground	1891, 1896-	1891, 1896-	
Average per undercutting machine underground	1891, 1896-	1913, 1922-	
Total loaded by machine	1923-1925	1923-1925	
Total loaded mechanically underground	1926, 1928-	1926, 1928-	
Loaded mechanically underground, by method	1926, 1928-		
Loaded by machine, by type of machine	1928-		
Handled by conveyors, by type of conveyor	1928-	1928-	
Total of mechanized mines (mines using loading machines only, including scrapers, duckbills, etc.)	1926, 1928-	1926, 1928-	
Total of mines using conveyors only (pit car loaders and other loading conveyors)	1928-	1928-	
Total of mines using both loading machines and conveyors	1928-	1928-	
Size classes of mines			
Total	1905, 1910-1914, 1917-	1910-1914, 1917, 1919-	
Average per mine	1910-1914, 1917, 1919-	1910-1914, 1917, 1919-	
Size of producing company ^a	1895, 1905, 1920, 1929	1895, 1905, 1920, 1929	
Consumer owned mines	1913-1926	1913-1926	
Commercial mines	1913-1926		
Cleaning of coal			
Total mechanically cleaned by wet methods at the mine	1906-	1906-	
Total mechanically cleaned by wet methods at central washeries operated by consumers	1927-		
Total mechanically cleaned by wet methods	1927-		
Total mechanically cleaned by pneumatic methods	1927-		
Total by wet and pneumatic methods	1927-	1927-	

SURVEY OF AVAILABLE DATA

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ANNUAL PRODUCTION (Cont.)

DESCRIPTION	TOTAL		
	UNITED STATES	BY STATES	BY COUNTIES
Cleaning of coal (<i>cont.</i>)			
Total by wet methods classified by type of equip- ment used	1927-		
Total washed coal charged in by-product ovens	1914-1929		
Total washed coal charged in beehive ovens	1890-1892 1914-1929		
Total washed coal charged in all ovens	1890-1929		

MONTHLY PRODUCTION

Total (estimated)	1905-	1917-
Average per working day per month	1905-1930	1923-1925, 1927-1930
Bituminous coal less coal equivalent of coke made in the same months	1912-1930	

WEEKLY PRODUCTION

Total (estimated)	1917-	1917
Average per working day per week	1919-	

¹ Also available for U. S. Coal Commission fields since 1920 and for Coal Conservation Act districts since 1925.

² See also O. E. Kiessling, F. G. Tryon, and L. Mann, *The Economics of Strip Coal Mining*, Economic Paper 11 (Government Printing Office, Washington, 1931).

³ Also available for U. S. Coal Commission fields for 1929.

stripping go back to 1914 for states and the country as a whole, and to 1923 for counties.

The average output per man per day and per year for all bituminous mines has been compiled since 1890, and are available by states and counties. Similar data for states and for the country as a whole since 1914, and for counties since 1923, have been published for mines engaged in stripping operations. The statistics per man per day employed underground go back to 1911. Additional labor data are available for selected years.

b Consumption

For selected years since 1899 figures on the consumption of bituminous coal for the principal classes of consumers have been compiled by the Bureau of Mines. In this group are included colliery fuel, local sales at mines, locomotive fuel for all steam railways, coal loaded in bunkers of vessels in foreign trade, coal used at beehive and by-product coke ovens, gas and steam coal used at iron and steel works, as well as coal consumed by coal and water gas plants, electric public utilities, general manufacturing industries, and all other users. Statistics on the total consumption of bituminous coal in the United States are available by years since 1918. These were estimated by means of the following formula: total production plus imports minus exports, plus or minus changes in consumers' stocks. In addition the Bureau has collected the total bituminous coal consumed annually by coke beehive ovens and by coke by-product ovens since 1917. Data on the consumption of coal at coal mines are available for counties and for the country as a whole for many years. The Bureau also publishes the total annual consumption of coal by electric public utilities (compiled by the Federal Power Commission), and by locomotives of Class I steam railways (compiled by the Interstate Commerce Commission), as well as the coal delivered to bunkers of vessels engaged in foreign trade (compiled by the Bureau of Foreign and Domestic Commerce). Information for several other classes of consumers has been compiled by the Bureau for more recent years: steel works and rolling mills, coal-gas retorts, and cement mills.

The Bureau has also compiled data showing the effect of fuel economy on consumption of coal per unit of performance in certain industries and services. This series is described in Part II, B, 6 and 7. Closely related to consumption are the data on the annual supply of energy from mineral fuels and water power. This series for census years is available for many decades, and is continuous since 1918.

c Distribution

For 1917, 1918, and 1929, the Bureau of Mines made studies of the total movement of bituminous coal from each major producing field to each consuming state. The distribution of coke

was surveyed in 1916 and 1929. The information on the flow of bituminous coal published by the Bureau of Mines is "based upon reports received from the originating railroads, supplemented by returns from coal traffic associations and other trade sources". The data on the movement of coal to several important market areas have been made available by the Bureau by months and by years beginning about 1920. Compiled by railroad coal traffic organizations, they include lake cargo, the movement to Tidewater, the all-rail westward movement from the Appalachians, and the all-rail movements from Illinois, Indiana, and western Kentucky.

d Stocks of Coal held by Consumers

The stocks held by consumers have been compiled by the Bureau and are available for selected months for 1916-32 and by months for subsequent years. The consuming groups for which separate data are shown are by-product coke plants, steel plants, other industries, coal gas plants, electric public utilities, bituminous coal dealers, and railroads. Detailed statistics by localities are published in mimeographed form.

e Equipment and Methods of Mining and Preparation

For several years the Bureau has collected data on equipment and methods of mining and preparation. The information relating to methods of recovery, that is, mined by hand, shot off the solid, cut by machines, and from strip pits, goes back to 1911. The statistics on loading machines and conveyors were first compiled for 1923-25. The data for 1925 were revised and a comparable series developed for subsequent years. This series makes available for states and for the country as a whole the number of mines using mechanical loading, the number of machines in use, and the net tons mechanically mined. It gives also the net tons produced by different types of loader and conveyor.

The Bureau made a special study of underground haulage equipment in 1925 and of screening and sizing in 1927. Data relating to coal mechanically cleaned by wet and pneumatic methods have been compiled since 1927. During 1929 coal stripping, loading machinery, and mechanical cleaning were studied intensively.

2 CENSUS OF MINES AND QUARRIES¹⁹

The Census of Mines and Quarries contains several items of information not usually collected by the Bureau of Mines in its annual canvass of the bituminous coal industry. Questions were added to the regular schedules of the Bureau of Mines for 1935 which made the coverage more nearly like that of the Census.

The additional information secured for 1935, gathered by the Bureau of Mines in cooperation with the Bureau of the Census, included data on certain items of mine expenditures: cost of

- a) Supplies and materials
- b) Fuel for all purposes
- c) Purchased electric current

It included also data on the number of employees other than wage earners and their total compensation. These employees are classified as:

- a) Proprietors and firm members
- b) Salaried officers of corporations
- c) Supervisory and technical employees
- d) Other salaried employees

In addition to the data collected annually by the Bureau of Mines on the number of wage earners, the 1935 schedule called for the total amount of wages paid and for the amount of compensation received for work or services performed for other establishments.

The additional information obtained for 1935 is in general comparable to information obtained in the 1929 Census of Mines and Quarries, although there are some minor differences in classification. The 1935 schedule omits several groups of questions contained on the census schedule for 1929, the most important being those relating to: (a) the number of units of power equipment and their total horsepower, (b) the amounts and kinds of fuel consumed and the amount of electric current generated or purchased, (c) the distribution of sales by type of sales agency.

For purposes of price analysis the data collected by the Census of Mines and Quarries are of relatively little use. The data on total selling value of the product f.o.b. the mines may be used

¹⁹ Prepared by W. G. Fritz and T. A. Veenstra, Bureau of Business Research, University of Pittsburgh.

with the figures on quantity produced to compute average mine prices. Annual data collected by the Bureau of Mines will serve as well, however, and will in addition have the advantage of more frequent collection. A partial approach may be made to an analysis of costs through certain items of information obtained by the Census: (a) cost of supplies, fuel, and electric current, (b) total salaries and wages paid. These are items of direct costs. The schedule calls for the cost of development work and the cost of equipment purchased in the census year; but the irregularity of these items of expenditure makes the data of virtually no use for the estimation of indirect costs.

The classification of coal sales by distributing agency, in the 1929 Census, is important in price research. The number of tons and the total value are given for:

- a) Deliveries direct to consumers who own or control the mine through direct ownership, and sales to affiliated consumers
- b) Sales direct to other consumers (including retailers) invoiced by the main office of the mining company
- c) Sales arranged and invoiced by separate or branch sales offices of the mining company
- d) Sales through a separately incorporated selling company owned by the same interests as the mining company
- e) Sales to independent wholesalers or jobbers, and sales through non-affiliated agents on commission
- f) Other sales

This classification was not used in 1935. Replies to the questions on the 1929 Census schedule were required by Act of Congress, whereas the Bureau of Mines depends on voluntary cooperation. The latter's coverage is, however, quite complete, the exception being small 'wagon' mines.

The Bureau of the Census conducted a Census of Wholesale Business and of Retail Business for 1929, 1933, and 1935. The schedules contained questions on the sales of coal. The wholesale schedule called for a report on the number of tons sold and the dollar amount of net sales for bituminous and for anthracite coal. The retail schedule covered the number of tons of all kinds of coal sold and the dollar amount of net sales. Publication of the data collected, however, has not been in a form to secure maximum usefulness. Statistics for retail business are by type of business rather than by commodity. For example, data on sales, employees, wages, etc., are for coal and ice dealers.

TABLE I-7
Supplementary Data on the Bituminous Coal Industry
Compiled by Federal Agencies

DESCRIPTION	TIMING	PERIOD COVERED	COMPILER
<i>Consumption</i>			
Receipts, stocks, consumption, and costs of anthracite and bituminous coal for Class I steam railways	Annually	1917-	Interstate Commerce Commission
Same	Monthly	1921-	Interstate Commerce Commission
Consumption of coal by states for electric public utility power plants	Monthly and Annually	1919-	Federal Power Commission
(Data for January 1919 to June 1936, incl., compiled by U. S. Geological Survey)			
<i>Distribution</i>			
Tonnage of revenue coal hauled by Class I steam railways	Quarterly	1928-	Interstate Commerce Commission
Total revenue collected on coal by Class I steam railways	Quarterly	1928-	Interstate Commerce Commission
<i>Employment and Pay Rolls</i>			
Index of employment	Monthly	1929-	Bureau of Labor Statistics, Division of Employment Statistics
Index of pay rolls	Monthly	1929-	" " "
Average weekly earnings	Monthly	1929-	" " "
Average hours worked per week	Monthly	Nov. 1932-	" " "
Average hourly earnings	Monthly	Nov. 1932-	" " "

Surveys of wages and hours of labor in bituminous coal mining	At 2- or 3-year intervals *	1919-	Division of Wages, Hours, and Working Conditions
<i>Imports and Exports</i>			
Source of imports and destination of exports by countries	Annually	1820-	Department of Commerce, Bureau of Foreign and Domestic Commerce
Total (source of imports and destination of exports by countries are shown only in preliminary reports subject to revision)	Monthly	1865-	" " "
<i>Income</i>			
Profit and loss for coal companies reporting to Bureau of Internal Revenue	Annually	1917-1921, 1925, 1928-	Bureau of Internal Revenue

* For publication of these data see Table I-8.

SURVEY OF AVAILABLE DATA

One table gives for each type of store the proportion of business done in each commodity sold. For wholesale businesses the dollar amount of net sales is shown for each major commodity. Coal and coke sales are combined, and one figure is shown for each type of wholesaler in each state.

3 SUPPLEMENTARY DATA ON THE BITUMINOUS COAL INDUSTRY COMPILED BY OTHER FEDERAL AGENCIES

In addition to the statistics published by the Bureaus of Mines and of the Census, other Federal agencies, including the Interstate Commerce Commission, the Federal Power Commission, the Bureaus of Foreign and Domestic Commerce, of Internal Revenue, and of Labor Statistics, compile data on bituminous coal, some of which are useful to those interested in price research (Table I-7). The hours and earnings data published by the Bureau of Labor Statistics are shown separately in Table I-8.

4 FEDERAL INVESTIGATION AND REGULATION OF THE BITUMINOUS COAL INDUSTRY

Much valuable information on bituminous coal has been brought together by Federal commissions and Congressional investigations. The published reports of the United States Coal Commission of 1922 should be mentioned especially. A chronological account of the hearings and investigations by the Federal government through various agencies and of laws dealing with the regulation of the industry since 1917 is given in Section D.

5 STATE DEPARTMENTS OF MINES

Departments or bureaus of mines have been established in twenty odd states. The large number of these agencies and the publication of the statistics compiled by them in numerous annual reports make it impossible at this time to present a careful survey of the data. The kind of statistics collected varies from state to state and frequently from year to year in a given state. The published data cover a wide variety of information, including statistics on production, value, consumption by uses, equipment and methods of recovery and preparation, number of employees engaged at the mines and in occupational groups or occupations, nationality, days worked by mines, thickness of

TABLE 1-8

Publication of Surveys of Wages and Hours of Labor in
Bituminous Coal Mining, United States Bureau
of Labor Statistics

YEAR	BULLETIN	TITLE
1919	279	Hours and Earnings in Anthracite Coal Mining in 1919 and 1920, and in Bituminous Coal Mining in 1919
1922	316	Hours and Earnings in Anthracite and Bituminous Coal Mining (Anthracite, January 1922; Bituminous, Winter of 1921-22).
1924	416	Hours and Earnings in Anthracite and Bituminous Coal Mining, 1922 and 1924
1926	454	Hours and Earnings in Bituminous Coal Mining, 1922, 1924, and 1926
1929	516	Hours and Earnings in Bituminous Coal Mining, 1929
1933	601	Wages and Hours of Labor in Bituminous Coal Mining, 1933
1936	(in preparation)	

seams, depth of mining, wages paid, analyses of coal, explosives used, number of new mines and of abandoned mines, and number and causes of accidents.

The caution with which these reports must be used was mentioned under Section B, l, g.

D CHRONOLOGY OF FEDERAL INVESTIGATION AND REGULATION OF THE BITUMINOUS COAL INDUSTRY ²⁰

1917-1919: War-Time Control

UNITED STATES FUEL ADMINISTRATION

Report of the Distribution Division, 1918-1919. Parts I and II review the salient features of the coal situation, and the oper-

²⁰ Based upon a chronology prepared by Charles E. Persons.

ation of governmental regulation and control in the distribution of coal and coke. Part III contains detailed statistics which were collected, compiled, and tabulated by the Bureau of Statistics of the Fuel Administration during the War.

FEDERAL TRADE COMMISSION

Cost Reports of the Federal Trade Commission: Coal. Numbers 1, 3, 4, 5, 6, and 7 (June 30, 1919)

Preliminary Report of the Federal Trade Commission on Investment and Profit in Soft-Coal Mining: Part I (May 31, 1922); Part II (July 6, 1922)

1920-1924: Commission Reports, Congressional Hearings, and Legislative Proposals and Enactments

COMMISSION REPORTS

Majority and Minority Reports of the United States Bituminous Coal Commission to the President, 1920

Report of the United States Coal Commission Transmitted Pursuant to the Act Approved September 22, 1922 (Public-No. 347, in five parts, 1925)

CONGRESSIONAL HEARINGS

Increased Price of Coal: Hearings before subcommittee of the Interstate Commerce Committee, United States Senate, pursuant to S. Res. 126, directing Committee on Interstate Commerce to hold hearings in order to take inquiry into causes which have brought about enormous increase in market price of coal and to report its findings and recommendations with view to Congressional or Executive action (in four parts, 1919-20, 66th Cong., 2d Sess.)

Hearings before Select Committee on Reconstruction and Production, United States Senate, pursuant to S. Res. 350, authorizing appointment of committee to inquire into general building situation and to report to Senate, before December 1, 1920, such measures as may be deemed necessary to stimulate and foster development of construction work in all its forms; Coal and transportation (1921, 66th Cong., 2d Sess.)

Hearings before the Manufactures Committee, United States Senate, on S. 4828, to promote general welfare by gathering information respecting ownership, production, distribution, costs, sales, and profits in coal industry and by publication of same,

and to recognize and declare coal and its production and distribution charged with public interest and use (3 vol., 1921, 66th Cong., 3d Sess.)

Hearings before the Education and Labor Committee, United States Senate, pursuant to S. Res. 80 directing the Committee on Education and Labor to investigate recent acts of violence in coal fields of West Virginia and adjacent territory and causes which led to conditions which now exist in said territory (1921-22)

United States Coal Commission, report to the Interstate and Foreign Commerce Committee, House of Representatives, to accompany HR 12377. H. Rp. 1181 (1922, 67th Cong., 2d Sess.) Investigation of wages and working conditions in coal mining industry, hearings before the Labor Committee, House of Representatives, on HR 11022, to establish commission to inquire into labor conditions in coal industry (1922, 66th Cong., 2d Sess.)

PRINCIPAL BILLS INTRODUCED

S 4087, Seasonal freight rates (1920)

S 4287, Seasonal freight rates (1920)

S 1806, Seasonal rates for transportation of coal (1921)

S 1807, Coal industry stabilization (1921)

S 41, Amendment to Interstate Commerce Act to provide seasonable rates for transportation of coal (1921, 67th Cong., 1st Sess.)

S 42, To provide for appointment of Federal Coal Commissioner, to define his powers and duties, and for other purposes (1921, 67th Cong., 1st Sess.)

S 824, To provide for appointment of Federal Coal Commissioner, to define powers and duties of such Commissioner, and directing director of Geological Survey to act as such Commissioner, and for other purposes (1921, 67th Cong., 1st Sess.)

S 2557, Provision for investigation and publicity, brokerage tax, and emergency control of prices (1921)

S 2558, Defining and punishing profiteering in coal (1921)

S 3805—HR 12377, To establish commission to be known as Coal Commission for purpose of securing information in connection with questions relative to interstate commerce in coal (1922, 67th Cong., 2d Sess.)

S 3940—HR 12472, To declare national emergency to exist

in production, transportation, and distribution of coal and other fuel, granting additional powers to the Interstate Commerce Commission, providing for appointment of Federal Fuel Distributor, providing for declaration of car service priorities during present emergency, and to prevent sale of fuel at unjust and unreasonably high prices (1922, Public-No. 348, 67th Cong., 2d Sess.)

PRESIDENTIAL ACTION

Address of the President to representatives of coal operators and miners, July 1, 1922

Address of the President to Congress, August 18, 1922

Address of the President on coal problems, delivered at Cheyenne, Wyoming, June 25, 1923

LEGISLATION ENACTED

S 3805—HR 12377, establishing the Coal Commission, September 22, 1922

S 3940—HR 12472, establishing the Federal Fuel Administration, September 22, 1922

1925-1933: Proposals for Federal Control

CONGRESSIONAL HEARINGS

Hearings on coal legislation before the Interstate and Foreign Commerce Committee, House of Representatives (1926, 69th Cong., 1st Sess.)

Hearings before the Committee on Interstate Commerce, United States Senate, 70th Cong. 1st Sess., pursuant to S. Res. 105, a resolution to investigate conditions in the coal fields of Pennsylvania, West Virginia, and Ohio (in two volumes, Government Printing Office, Washington, 1928)

Hearing before the Committee on Interstate Commerce, United States Senate, on S 4490 (1929, 70th Cong., 2d Sess.)

Hearing before a subcommittee of the Committee on Mines and Mining, United States Senate, 72d Cong., 1st Sess. on S 2935 . . . (Government Printing Office, Washington, 1932)

Hearings before a subcommittee of the Manufacturers Committee, United States Senate, on S. Res. 178, for investigations of conditions in coal fields of Harlan and Bell counties, Ky. (1932)

BILLS PROPOSED

HR 3980. Emergency control

S 4177, to regulate interstate and foreign commerce in coal and to promote general welfare dependent on use of coal. Submitted by Mr. Copeland, 1926

S 4490, to regulate interstate and foreign commerce in bituminous coal, provide for consolidations, mergers, and cooperative marketing, regulate fuel supply of interstate carriers, require licensing of corporations producing and shipping coal in interstate commerce, and to create Bituminous Coal Commission. Submitted by Mr. Watson, 1928

S 4490 reintroduced as S 2888, 1930

S 2935, a bill to regulate interstate and foreign commerce in bituminous coal; provide for consolidations, mergers, and cooperative marketing; require the licensing of corporations producing and shipping coal in interstate commerce; and to create a Bituminous Coal Commission; and for other purposes (1932) (S 2935—HR 7536, Davis-Kelly Bill)

HR 9924—Control by Commission, with allocation of tonnage and price fixing. Hayden amendment. Introduced excise tax idea.

S 1875—HR 6040. A combination of the bills of Messrs. Lewis and Hayden

October 1933—May 1935: Control under the National Industrial Recovery Act

National Recovery Administration: Code of Fair Competition for the Bituminous Coal Industry. As approved by President Roosevelt in executive orders of September 18, 1933 and September 29, 1933, incorporating so far as possible the conditions of the executive orders in the text of the Code . . . (Government Printing Office, Washington, 1933) Registry No. 702-45

1935: Introduction and Passage of the Guffey-Snyder Bill

CONGRESSIONAL HEARINGS

Hearings before a Subcommittee of the Committee on Interstate Commerce, United States Senate, 74th Cong. 1st Sess., on S 1417 . . . (Government Printing Office, Washington, 1935)

Committee on Interstate Commerce, United States Senate, report to accompany S 2481

Hearings before a subcommittee of the Committee on Ways and Means, House of Representatives, 74th Cong., 1st Sess., on HR 8479 . . . (Government Printing Office, Washington, 1935)

BILLS INTRODUCED

S 1417, 74th Cong., 1st Sess., "A bill to stabilize the bituminous coal mining industry and promote its interstate commerce; to provide for cooperative marketing of bituminous coal; to levy a tax on bituminous coal and provide for a drawback under certain conditions; to declare the production, distribution, and use of bituminous coal to be affected with a national public interest; to conserve the bituminous coal resources of the United States and to establish a national bituminous coal reserve, to provide for the general welfare, and for other purposes"

HR 8479, Snyder Bill

HR 8479—S 2481, Guffey-Snyder Coal Bill

Passage and Approval of Guffey-Snyder Act. HR 9100. Public-No. 402, 74th Cong. Same title as S 1417. Approved August 30, 1935

1937: Guffey-Vinson Act

Public-No. 48, 75th Cong.—Chapter 127—1st Sess. HR 4985. An act to regulate interstate commerce in bituminous coal, and for other purposes . . . Approved April 26, 1937

APPENDIX II

Appraisal of Price Series Collected by the Bureau of Labor Statistics and Recommendations for their Revision

THE LARGE body of statistical information collected currently concerning the bituminous coal industry made it necessary to confine any intensive appraisal of the data and recommendations for their improvement to prices. The Bureau of Labor Statistics, which has begun to revise its wholesale and retail price reporting services, offered to cooperate with the Committee. This offer was accepted because it was apparent that in view of the wide-spread area in which bituminous coal is produced and sold, only a Federal agency could assume the task of collecting an adequate sample of wholesale and retail prices. Accordingly, this Appendix, which fulfills the third specific aim of the Committee, is restricted to appraisals of the wholesale and retail price series being collected by the Bureau of Labor Statistics and recommendations for their revision.

A WHOLESALE PRICES

An appraisal by the Committee and the Wholesale Price Division of the Bureau of Labor Statistics revealed that certain modifications would add greatly to the usefulness of price data for bituminous coal. It is especially important that changes be made in the types of price collected, the specifications for which quotations are secured, and in the 'coverage' or the distribution of the sample among the various markets and coal producing fields. The practices in need of revision are discussed below.

Types of price

The data used for prices of bituminous coal are quotations f.o.b. cars destination. The selection of a destination price in the early 'twenties was made after discussions with interested agencies and individuals. It was thought that such prices would represent the wholesale prices of bituminous coal in terms of the Bureau's concept of 'wholesale prices'. The use of destination prices would also obviate any criticism with respect to duplication of governmental work such as the sales realization values f.o.b. mines compiled by the Bureau of Mines. Furthermore, it would carry a step forward the work being performed by recognized trade journals which quote prices f.o.b. mines for delivery in designated cities.

The Committee recognizes that both destination and f.o.b. mine prices should be collected, but of the two, the latter is the more responsive to changing conditions in the industry. The freight charges included in the destination prices often represent an amount equal to or even greater than the price at the mine. This item, over which the coal operators have no control, added to the f.o.b. mine price, gives a total figure that is often misused in comparisons of long- and short-time changes in the prices of coal with those of the prices of other commodities. Many series used by the Division are not on a delivered basis, textile prices, for example, being f.o.b. the mill. The general practice of the bituminous coal industry is to sell coal f.o.b. the mine. Although freight charges enter into the total cost of the coal to the purchaser, he is usually billed for coal f.o.b. mine and assumes responsibility for transportation charges.

A second criticism arises out of the fact that the destination prices used are merely quotations. Such figures are more representative of what the mines and their selling agents hope to receive than of the prices at which the coal is actually sold. This limitation is inherent in the use of any quotation as a indicator of price.

Specifications

The Division's current practice of grouping a variety of sizes of coal under the classification 'prepared sizes' conceals the diversity of prices arising out of differences in these sizes. Furthermore, none of the data reveals the variation in prices among

the producing fields or even the differences between low and high volatile coals.

Coverage

The important markets are not adequately represented. Of the 63 quotations included in the index of bituminous coal prices (Table I-2), 3 quotations are from Chicago, 2 from New York, 2 from Pittsburgh, and none from Philadelphia, while 9 are used from Minneapolis, 8 from St. Louis, 7 from Indianapolis, 6 from Atlanta, and 5 from Birmingham. Furthermore, the sample of quotations from various sections of the United States is not distributed in accordance with their relative importance in the consumption of bituminous coal. Only 4 quotations are from the Middle Atlantic states, including the 2 from Pittsburgh, and only 1 from New England although there are 22 from the East North Central states, 20 from the West North Central area, and 10 from the South Atlantic region. All 5 quotations from the East South Central states are from Birmingham. The West South Central states are represented by 1 quotation from New Orleans. No quotations are used from the Mountain and Pacific regions.

Recommendations¹

All these defects in its present data were recognized by the Wholesale Price Division. The following recommendations for the revision of its work were developed cooperatively by it and the Committee. They must be considered in connection with the Bituminous Coal Act of 1937. It is possible that a major portion of the data needed may be made available as a by-product of the work of the National Bituminous Coal Commission. However, an important prerequisite of a price series is continuity. Therefore, until the Commission is fully organized and its data are appraised, it is recommended that the Wholesale Price Division of the Bureau of Labor Statistics be requested to collect, compile, and publish data on the prices of bituminous coal in accordance with these suggestions.

¹ These recommendations are based upon the report of a subcommittee composed of Jesse M. Cutts, P. A. Hollar, Allan Willett, W. H. Young, and Waldo E. Fisher, Chairman, and were approved by the Committee.

Frequency of collection

Price data should be collected monthly. Because operators keep their records on a monthly basis it is deemed inadvisable to attempt to collect weekly prices.

Source and specifications of data to be collected

It is recommended that the data for the computation of mine prices be obtained from coal operators on standard forms prepared by the Wholesale Price Division of the Bureau of Labor Statistics. The reporting companies would be asked to supply for each specification for which data are desired the total tonnage shipped each month and the total proceeds. From these data the Bureau would compute the average realized price for each size.

The Committee gave careful attention to the development of the specifications or size classes for which coal prices should be collected. It is of the opinion, however, that the specifications suggested below should be submitted to representative operators in the important coal regions to determine whether they are applicable to bituminous coal fields in general.

NUMBER	SIZE	SPECIFICATIONS IN INCHES
1	Lump, block, etc.	4 and over
2	Egg, chunk, etc.	2 to 8
3	Nut, stove, furnace, etc.	1¼ to 3
4	Nut, nut and slack, etc.	Under 2
5	Domestic stoker	
6	Mine run	

The use of the suggested sizes would supersede the Division's present classification of bituminous coal into mine run, prepared sizes, and screenings. The proposed classification is in line with the Division's present policy of adopting more definite specifications for all items covered in its wholesale price work.

It is recognized that the above size classes overlap and that their adoption would add to the difficulty of interpreting the price data by sizes. The use of arbitrary size classes that do not overlap would, however, tend to encourage the operators to force their various shipments into the classes specified and thus impair the data for the individual size classes. Moreover, since the Committee's objective is to obtain from reporting mines not

only realized prices by major size classifications but also the average realized prices of all coal shipped in a given month, and since it is the market practice to divide coal into many different sizes, the number and specifications of which often vary from month to month, overlapping categories seem unavoidable.

Because of the difficulties of defining contract and spot sales in terms easily understood by operators and because of the work involved in collecting and compiling these two sets of prices, it is deemed inadvisable to distinguish between these items. The Committee, therefore, recommends the collection of realized prices for all shipments.

Collection of mine prices by market areas not recommended

The Committee recognizes that the *mine price* charged on a given day for a particular size may vary for different market areas. It believes, however, that such price differentials are not substantial in most instances, and that the cost of collecting prices by market areas would be out of all proportion to the usefulness. It recommends, therefore, that mine prices should be collected for producing fields and not for market areas.

Coverage

In the opinion of the Committee, the producing fields from which price data are to be obtained should conform as far as possible to the classification of producing areas designated by the Bituminous Coal Act of 1937. If funds are available or can be obtained, the Committee recommends that prices be collected and computed for each district established by the Act. If this is not feasible, certain fields, particularly those west of the Mississippi River, may be combined. Combinations, however, should not cut across the boundaries fixed by the Act for individual fields, subdivisions, etc. It is especially important that fields producing low and medium volatile coal should not be combined with any producing high volatile coal.

Data should be obtained from representative producers in each field and in sufficient number to represent conditions existing in each field or district. The Committee recommends that the Wholesale Price Division send schedules to at least 189 companies selling their coal in the commercial markets with the request that the data be supplied by districts. The suggested allocation of schedules among the 23 producing fields is given in

Table II-1. It is recognized, of course, that actual experience with price collection will suggest modifications. The proportion of the total tonnage for which prices are to be obtained in a given district and the names of the companies that are to be re-

TABLE II-1

Number of Reporting Companies and Percentage of
Total Production by Producing Districts

No.	PRODUCING DISTRICTS Name	NUMBER OF REPORTING MINES	PERCENTAGE OF TOTAL PRODUC- TION IN 1934 *
1	Eastern Pennsylvania	30	10.55
2	Western Pennsylvania	20	15.04
3	Northern West Virginia	10	5.33
4	Ohio	10	5.81
5	Michigan	3	.18
6	Panhandle of West Virginia	3	1.11
7	Southern Numbered 1	15	12.32
8	Southern Numbered 2	25	20.23
9	Western Kentucky	3	2.20
10	Illinois	20	11.41
11	Indiana	10	4.14
12	Iowa	3	.93
13	Southeastern	3	2.96
14	Arkansas-Oklahoma	4	.39
15	Southwestern	4	2.06
16	Northern Colorado	3	.64
17	Southern Colorado	3	.99
18	New Mexico	3	.16
19	Wyoming	4	1.21
20	Utah	3	.67
21	North and South Dakota	3	.51
22	Montana	3	.73
23	Washington	4	.39
	All fields	189	100.00

* Preliminary.

quested to supply price data may be determined by the Wholesale Price Division in cooperation with the Bureau of Mines.

Computation of average prices

The Committee recommends that the Wholesale Price Division compute the average realized prices of: (1) mine-run coal and each of the previously specified sizes for each district; (2) all sizes combined for each field; (3) all sizes combined for the

country as a whole. In addition, it is recommended that in the case of Eastern Pennsylvania and Southern No. 1 separate averages be shown for low, medium, and high volatile coals.

The average price for each specified classification for each district would be computed from the reported data based on identical firms for at least two successive periods. Thus, the average realized price for each classification for each district would be determined by totaling the reports for each size for each district and dividing dollars received by tonnage shipped.

To calculate average prices for all sizes for each field and for the country as a whole it will be necessary to develop fixed weights. It is suggested that the Wholesale Price Division send questionnaires to commercial companies producing 200,000 tons or more during 1936. These companies would be requested to supply for all shipments, exclusive of coal used at the mine, the total annual shipments in tons for each of the specifications designated above. These data would disclose the relative importance of each specification and would enable the Wholesale Price Division to establish fixed weights to be used in the computation of average prices by districts and for the country as a whole.

The Committee recommends that fixed rather than variable weights be used in all computations of average prices. The weights should be examined from time to time to ensure their representativeness. The tonnage data secured from the monthly reports could serve as a rough check on changes in the relative importance of specific sizes of coal.

F.o.b. destination prices

For special studies of prices it is important to know prices f.o.b. destination in addition to those f.o.b. mine. The destination price, which is essentially the mine price plus freight, represents the cost of coal to the purchaser, but the f.o.b. mine price represents the amount received by the operator. In the absence of specifically reported f.o.b. destination prices it is recommended that destination prices be obtained by adding the established freight rates to the computed mine prices. The freight rates from any producing field to any designated market can be secured from the Interstate Commerce Commission. Prices computed in this manner may not be accurate, but they will be satisfactory for most purposes.

The list of cities for which destination prices are now obtained is inadequate. From the 1929 Census of Manufactures the 100 largest coal consuming counties could be ascertained. It is recommended that among them not less than 50 cities be chosen for which prices f.o.b. destination should be compiled. The Wholesale Price Division should work closely with the Bureau of Mines in the selection of the counties and cities to be covered.

Provision for splicing series

In order to splice the series of prices collected under the Division's present procedure with the series that may be collected under the procedure approved by the Committee, it is recommended that prices be collected in accordance with the present procedure for at least a year after any revised methods are introduced.

Publication

The Wholesale Price Division is primarily interested in the trend of average realized prices for the country as a whole. Limitations of space and cost may preclude monthly publication of detailed prices by sizes and fields and at selected destinations. At less frequent intervals, however, the Division may be able to publish general summaries of these data. It is recommended that the detailed data be made available each month in mimeographed form or that they be supplied to coal journals or other private agencies interested in publishing them. This procedure will meet the requirements of the bituminous coal industry and make possible analyses of prices by other agencies. No data that will in any way disclose the identity of individual companies should be published or furnished to anyone.*

B RETAIL PRICES

Appraisal of the retail coal prices compiled by the Retail Price Division of the Bureau of Labor Statistics in connection with its price series for household heating fuels revealed that the usefulness of the price data for bituminous coal would be greatly enhanced if the procedure were modified in several ways. The elements of the methods used by the Division prior to 1937,² which needed to be revised, were primarily concerned with

² For a description of procedure used prior to 1937 see Ap. I, A, 2.

specifications of the published series, the coverage of the principal retail markets, the frequency of collection, and the computation of average prices.

Specifications

In the past, the published series of retail prices of bituminous coal differentiated between low and high volatile coal and showed average prices for run-of-mine coal and for prepared sizes as a group. The practice of combining a variety of sizes under the classification 'prepared sizes' conceals the diversity of prices arising from differences in sizes and precludes analyzing variations in prices attributable to this factor. It is believed that retail prices should be shown for representative sizes as well as for all prepared sizes.

Coverage

Retail prices of bituminous coal were published for only 38 of the 51 cities for which data on food costs and average prices on electricity were collected. No prices were published for New England, and Pittsburgh alone was covered among the cities in the Middle Atlantic States. Since the household consumption of bituminous coal has increased substantially in these areas during recent years, the number and distribution of cities would seem to be inadequate.

The number of reporting dealers in each city has fluctuated from time to time but was seldom allowed to drop below 3 or increase to more than 6. It is deemed advisable to raise the upper limit and to increase the number of reporters in virtually all the larger cities.

Frequency of collection

The present practice of the Bureau of collecting retail coal prices on the 15th of March, June, September, and December does not adequately reveal seasonal fluctuations, for 70 per cent of the coal for household purposes is sold between September and March, and most of it is sold nearer December prices than at March, June, or September quotations.

Computation of average prices

Only the most important grades and sizes of coal sold in each city for household consumption were used for computing the

No. L. S. 3149
June 4, 1937U. S. DEPARTMENT OF LABOR
BUREAU OF LABOR STATISTICS
WASHINGTONRETAIL PRICES
FUEL A

CONFIDENTIAL

GENTLEMEN: Please enter the cash delivered retail price, as of the 15th of the current month, for each fuel item listed below which you sell to family trade. It will be appreciated if you will identify each item by its customary trade name (mine, district, or seam). Give solid fuel prices on basis of delivery at curb, or into bin without extra handling or additional charge. Please write comments regarding items or prices on the reverse side of this sheet.

Kindly return this form at your earliest convenience.

Very truly yours,
ISADOR LUBIN,
Commissioner of Labor Statistics.

ARTICLE, TRADE NAME, AND UNIT	CASH PRICE	ARTICLE, TRADE NAME, AND UNIT	CASH PRICE
COAL, PER TON (2,000 lb.)	<i>1-ton lots</i>	COKE, PER TON (2,000 lb.)	<i>1-ton lots</i>
Anthracite, Pennsylvania, white ash:			
02 Stove.....		78 Egg.....	
04 Chestnut.....			
06 Pea.....		BRIQUETS, PER TON (2,000 lb.)	
08 Buckwheat No. 1.....		70.....	
Anthracite, other than Pennsylvania:		HEATING OIL, PER 100 GALLONS	<i>100-gal. lots</i>
12 Egg.....		82 Range oil.....	
14 Nut.....		84 Fuel oil No. 1.....	
Bituminous, low and medium volatile (smokeless):		86 Fuel oil No. 2.....	
20 Lump.....		87 Fuel oil No. 3.....	
22 Egg.....		88 Fuel oil No. 4 ¹	
24 Nut.....		WOOD, PER CORD (128 cu. ft.)	<i>1-cord lots</i>
26 Stoker ¹		(Seasoned, sawed 12 to 24 inches and split)	
28 R. O. M. ¹		92 Softwood.....	
Bituminous, high volatile:		94 Hardwood.....	
30 Lump.....			
		OTHER FUELS	
32 Egg.....			
34 Nut.....			
36 Stoker ¹			

¹ Domestic.

Is there a sales tax on these fuels? _____ percent. Is tax included in above prices? _____

Additional charge for carrying coal from curb to bin is _____ per ton.

Name of person furnishing information _____

U. S. GOVERNMENT PRINTING OFFICE 16-5085

FIGURE 2

D. C. 1130
June 1, 1917

U. S. DEPARTMENT OF LABOR
BUREAU OF LABOR STATISTICS
WASHINGTON

RETAIL PRICES
FUEL B

CONFIDENTIAL

INSTRUCTIONS: Please enter the cash delivered retail price, as of the 15th of the current month, for each fuel item listed below which you sell to family trade. It will be appreciated if you will identify each item by its customary trade name (mine, district, or seam). Give solid fuel prices on basis of delivery at curb, or into bin without extra handling or additional charge. Please write comments regarding items or prices on the reverse side of this sheet. Kindly return this form at your earliest convenience.

Very truly yours,
JACOB LUSTIG,
Commissioner of Labor Statistics.

ARTICLE, TRADE NAME, AND UNIT	CASH PRICE	ARTICLE, TRADE NAME, AND UNIT	CASH PRICE
COAL, PER TON (2,000 lb.)	Per ton	COAL, PER TON (2,000 lb.)	Per ton
Anthracite, Pennsylvania, white ash:		Bituminous, high volatile, other than eastern:	
02 Stove		41 Lump	
04 Chestnut			
06 Run		42 Egg	
08 Best/worst No. 1			
Anthracite, other than Pennsylvania:		43 Nut	
12 Egg			
14 Nut		47 Stoker ¹	
Bituminous, low and medium volatile (semian-			
thracite):			
21 Lump			
23 Egg		COKE, PER TON (2,000 lb.)	
25 Nut		72 Egg	
27 Stoker ¹			
30 B. O. M. ¹		BRIQUETS, PER TON (2,000 lb.)	
Bituminous, eastern high volatile (Ohio and		77	
Pennsylvania to Alabama):		HEATING OIL, PER 100 GALLONS	Per cent. sale
31 Lump		84 Fuel oil No. 1	
		85 Fuel oil No. 2	
33 Egg		87 Fuel oil No. 3	
		88 Fuel oil No. 4	
35 Nut		WOOD, PER CORD (128 cu. ft.)	Per cord sale
		(Seasoned, stacked 12 to 16 inches and split)	
37 Stoker ¹		92 Softwood	
		94 Hardwood	

¹ Domestic.

Is there a sales tax on these fuels? percent. Is tax included in above prices?

Additional charge for carrying coal from curb to bin is per ton.

Name of person furnishing information:

FIGURE 3

published average prices, and these figures were arithmetic averages. It seems advisable to increase the number of items priced in these cities and to abandon the old method of arriving at a representative price by taking a simple average of all quotations.

Modifications of Procedure during 1937^a

The following outline indicates the more important aspects of the changes in the retail price series for bituminous coal that have been put into effect during 1937.

Specifications

In order to list the sizes and grades of coal selected as most representative of household consumption in the various sections of the United States, new retail fuel price schedules were printed early in 1937. These schedules were used for an experimental collection in February and for the regular coal price reports of March and June. A second series of schedules, incorporating the changes suggested by experience with the preliminary forms, was printed in June (Figures 2 and 3). Coal sold under the same name in different sections of the United States varies so much in size that it is inadvisable to give exact dimensions.

Coverage

The distribution of the retail fuel price schedules used in each city of the 9 regional areas and the number of cooperating reporters in each city are shown in Table II-2. The 51 cities for which price data are obtained include all that are covered at present for the food cost indexes and the average prices of electricity. This change adds 13 representative markets in New England and the Middle Atlantic States to the 38 cities for which prices of bituminous coal have been published since 1923.

Frequency of collection

Prices are to be collected quarterly on: March 15, June 15, September 15, and December 15. These dates correspond with the dates for the quarterly cost-of-living surveys. If possible, it is hoped that prices will also be collected on the 15th of January,

^a Prepared by the Retail Price Division, Bureau of Labor Statistics. The major changes outlined in this section have been incorporated in the revised series of retail prices now being published by the Bureau.

TABLE II-2

Distribution of Retail Fuel Schedules and Reporters, by
Regional Areas and Cities

REGIONAL AREA AND CITY	SCHED- ULE	NUMBER OF REPORTERS	REGIONAL AREA AND CITY	SCHED- ULE	NUMBER OF REPORTERS
New England		42	South Atlantic		46
Boston	A	10	Atlanta	A	5
Bridgeport	A	5	Baltimore	A	10
Fall River	A	5	Charleston, S. C.	A	4
Manchester	A	4	Jacksonville	A	4
New Haven	A	6	Norfolk	A	4
Portland, Me.	A	5	Richmond	A	5
Providence	A	7	Savannah	A	5
			Washington, D. C.	A	9
Middle Atlantic		61			
Buffalo	A	8	East South Central		22
Newark	A	8	Birmingham	B	6
New York	A	14	Louisville	B	7
Philadelphia	A	12	Memphis	B	5
Pittsburgh	A	7	Mobile	B	4
Rochester	A	8			
Scranton	A	4	West South Central		18
			Dallas	B	4
East North Central		73	Houston	B	4
Chicago	B	14	Little Rock	B	4
Cincinnati	B	8	New Orleans	B	6
Cleveland	B	10			
Columbus, Ohio	B	5	Mountain		18
Detroit	B	12	Butte	A	4
Indianapolis	B	6	Denver	A	8
Milwaukee	B	10	Salt Lake City	A	6
Peoria	B	4			
Springfield, Ill.	B	4	Pacific		21
			Los Angeles	A	4
West North Central		31	Portland, Ore.	A	6
Kansas City	B	7	San Francisco	A	5
Minneapolis	B	7	Seattle	A	6
Omaha	B	5			
St. Louis	B	7			
St. Paul	B	5			
			TOTALS	A	188
				B	141
					332

TABLE II-3

Relative Heating Requirements of 51 Cities, Based upon
Dwelling-Day-Degrees *

REGIONAL AREA AND CITY	DWELLING- DAY-DEGREES OF HEAT		REGIONAL AREA AND CITY	DWELLING- DAY-DEGREES OF HEAT	
	1,000 units	Per- centage of total		1,000 units	Per- centage of total
New England	2,291,730	6.1	South Atlantic	1,987,300	5.3
Boston	1,068,790	2.9	Atlanta	190,440	.5
Bridgeport	203,630	.5	Baltimore	864,040	2.3
Fall River	159,760	.4	Charleston, S. C.	28,870	.1
Manchester	137,030	.4	Jacksonville	29,060	.1
New Haven	231,790	.6	Norfolk	104,500	.3
Portland, Me.	125,630	.3	Richmond	165,890	.4
Providence	365,100	1.0	Savannah	32,470	.1
			Washington, D. C.	573,030	1.5
Middle Atlantic	14,427,110	38.5	East South Central	703,910	1.9
Buffalo	949,090	2.5	Birmingham	147,230	.4
Newark	619,870	1.7	Louisville	334,890	.9
New York	9,135,100	24.3	Memphis	198,240	.5
Philadelphia	2,187,190	5.8	Mobile	23,550	.1
Pittsburgh	807,810	2.2			
Rochester	544,780	1.5	West South		
Scranton	183,270	.5	Central	391,500	1.1
East North			Dallas	139,610	.4
Central	11,807,370	31.4	Houston	85,740	.2
Chicago	5,282,960	14.1	Little Rock	55,670	.2
Cincinnati	575,800	1.5	New Orleans	110,480	.3
Cleveland	1,354,260	3.6			
Columbus, Ohio	404,120	1.1	Mountain	735,030	1.9
Detroit	2,380,240	6.3	Butte	79,230	.2
Indianapolis	523,130	1.4	Denver	464,760	1.2
Milwaukee	1,028,960	2.7	Salt Lake City	191,040	.5
Peoria	158,350	.4			
Springfield, Ill.	99,550	.3	Pacific	1,947,710	5.1
West North			Los Angeles	503,380	1.3
Central	3,278,500	8.7	Portland, Ore.	385,160	1.0
Kansas City	521,910	1.4	San Francisco	562,670	1.5
Minneapolis	915,330	2.4	Seattle	496,500	1.3
Omaha	327,890	.9			
St. Louis	972,220	2.6			
St. Paul	541,150	1.4	All Cities	37,570,160	100.0

* Preliminary day-degrees of heat for 49 of these cities were computed by Arthur H. Senner, Bureau of Engineering, U. S. Department of Agriculture.

February, October, and November, when the retail sales of household fuels are substantial.

Details of methodology

The retail fuel price schedules are distributed and returned by mail. The schedules are prepared for mailing by typing the identification names of the more important coals consumed in each city on the outgoing forms.

The Division is requesting a cash retail price, as of the 15th of

TABLE II-4

Retail Fuel Price Weighting Factors for Richmond, Virginia

FUEL ITEM	ESTIMATED CONSUMPTION *	HEAT PER UNIT	HEAT PRODUCED	Per- centage of total
		Thousands of b.t.u.'s	Millions of b.t.u.'s	
Anthracite, Pa.	20,000 tons	27,000	540	4
Bituminous, low volatile	300,000 "	29,000	8,700	63
Bituminous, high volatile	50,000 "	28,000	1,400	10
Coke	15,000 "	27,000	405	3
Briquets	5,000 "	28,000	140	1
Fuel oil	10,000,000 gal.	160	1,600	12
Wood	50,000 cords	21,000	1,050	7
Total			13,835	100

* As reported by the Secretary of the Retail Coal Dealers Association

the month, for sales in one-ton lots delivered at curb or into the customer's bin without extra handling or additional charge. Each dealer has been requested, on a special questionnaire, to indicate any deviations in his selling practice from these specified conditions.

No adjustment has been made for changes in the quality or preparation of the coal sold to household consumers. Only minor changes have occurred and these have been introduced gradually.

Weighting factors

Average prices of the different grades and sizes of coal in the 51 cities are combined with weighting factors based upon esti-

mates of the volume of sales of each grade or size in each city. Sales records and other information submitted by the fuel dealers and their associations in the various cities have provided the basis for most of these estimates.

During 1934 the Cost of Living Division of the Bureau of Labor Statistics conducted family expenditure surveys in each of the 51 cities included in the retail fuel price series. Summaries of these surveys will provide valuable information on household fuel consumption in each city. The family expenditure data, however, show fuel consumption only by type and do not furnish the necessary detail for weighting prices by grade and size.

Fuel requirements for household heating in each of the 51 cities is estimated on the basis of the number of day-degrees of heat required during an average year and the number of dwell-

TABLE II-5
Preliminary Weighting Factors for Richmond, Virginia

FUEL ITEM	WEIGHTING UNITS
Anthracite, Pa.	18
Bituminous, low volatile	278
Bituminous, high volatile	44
Coke	13
Briquets	4
Fuel oil	53
Wood	31
TOTAL	441

ing units affected (Table II-3). The number of day-degrees of heat for each city has been computed from Weather Bureau records of normal temperature in each city, based, in most cases, upon 30 or more years of observation. The day-degrees of heat for each month is the product of the number of days in the month and the number of degrees of normal temperature below 65 degrees Fahrenheit. The number of dwelling units has been based on the number of families shown in each city by the 1930 Census.

The dwelling-day-degrees of heat for each city can be checked against data that have been assembled on household fuel requirements. After discrepancies have been ironed out, a ratio distribution of heat requirements among the various cities can

be made. These ratios are taken as city weights and apportioned among the more important fuels in each city on the basis of their heat producing potentialities. This method of determining weighting factors is illustrated by Tables II-4 and II-5 which give a preliminary computation for Richmond.

Richmond requires 165,890,000 dwelling-day-degrees of heat during a normal year, as compared with 37,570,160,000 dwelling-day-degrees for the 51 cities included in the retail coal price series. On this basis, Richmond is 0.441 per cent of the total. If the total heat requirements for all 51 cities is adjusted to 100,000 units, the distribution of these units for the fuel items in Richmond would be as given in Table II-5.

Seasonal weighting factors

A careful study of the effect of using weighting factors for combining the monthly prices into annual averages indicates that the work involved would not be justified, since the annual average would be changed by merely a fraction of one per cent. The relationship of the weighted and unweighted prices was found to be fairly constant, indicating that the price changes from year to year would be practically the same with either method. Consequently, it was decided to compute the annual average without the use of seasonal weights. This procedure has been approved by the Bureau of Mines, and its application to the average prices of anthracite is acceptable to the Anthracite Institute.

Other aspects

The Bureau of Labor Statistics plans to expand its retail coal price reporting service to include all important competitive fuels. It is felt that the usefulness of this service will be enhanced if the full range of household heating fuels is covered.

It is hoped that personnel and funds will be made available for recomputing bituminous coal prices from 1928 to 1936 on the same basis as the new series.

Retail fuel price report, March 15, 1937

Retail coal prices for March 15, 1937 were collected on the new fuel price schedules sent to all 51 cities. Sufficient quotations to justify a published average price were not obtained for bituminous coal in New Haven, Rochester, and Scranton. In many other cities quotations were obtained for only a few grades and

sizes, owing to their strategic position with reference to important sources of fuel.

Recommendations of the Committee

The Committee approves the revision of procedure adopted by the Retail Price Division of the Bureau of Labor Statistics and used in its report on 'Retail Fuel Prices by Cities, March 15, 1937'. The continuation of these series and their extension to other cities, when such cities are included in the Bureau's general retail price reporting service, will provide data for analyzing the variations in prices in a given city that are attributable to differences in grade and size of coal, and will facilitate inter-regional comparisons between identical grades and sizes in order to determine variations in prices arising from differences between certain markets.

The Committee recommends that, if funds are available or can be obtained, retail prices of bituminous coal be collected monthly. If this is impossible, prices on the 15th of October, November, January, February, and April should be obtained in addition to the regular quarterly data.

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