THE ARMY INDUSTRIAL COLLEGE
Washington, D. C.

Course 1938-1939

THE COAL INDUSTRY AND INDUSTRIAL MOBILIZATION

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October 7, 1938

AIC 66 (10/21/38)14

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This problem of fuel supply that Colonel Riefkohl refers to is only a problem in big wars. In little wars the question of fuel has almost no significance. There is, of course, a certain job of Army procurement which is neither more nor less difficult than spending some $15,000,000 for other commodities; but the Army requirements for direct consumption would never, under any circumstances, constitute more than a small percentage of the total supply. The pinch, of course, comes in the fueling of the heavy industries which are the base of the pyramid of munitions manufacture. The maintenance of the public utility services and the continuous supply of household coal are necessary for the life of the civil population.

Since fuel supply means big tonnages it quickly runs into the question of man power and transport, which are likely to become limiting factors in any major national emergency. So it happened that during the great war in every one of the principal belligerent countries some form of special control of coal and other fuel supplies proved to be necessary.

Responding to Colonel Miles' request, what I hope to do this morning is to sketch very briefly our experience during the late war, and then to comment on the new type of industrial organization that is developing in the coal industry, largely as a result of the N.R.A. experience, and to raise a question as to how far that new organization might be useful in the event of another national emergency. I shall try to develop four major points, first, the objectives of war-time control, second, the economic factors in the coal industry with which that control necessarily has to deal, third, the lessons learned by the Fuel Administration during the World War which drove home the necessity for some type of organization, and were perhaps quite as instructive as to what not to do as they were as to what should be done; and fourth, to describe briefly the new type of collective organization which has been developing in the industry and to raise the question as to how that could be used in the event we get into another major emergency.

There are four main objectives of war-time control, stating them very simply. The first one is to hold down prices. Coal is a necessary of life, which almost everybody uses. It is a major element in the cost of production of many manufacturing

industries. It is a commodity that, if there is no limit set on price, may show a most fantastic reaction to shortage. People will pay almost anything for coal rather than go without it, and there have been times when the spot or non-contract price has risen to a thousand per cent above the ordinary levels. Therefore, some form of price control proved to be necessary in every one of the belligerent countries.

The second objective is to distribute the limited supply where it is most needed. That involves two kinds of priorities, priorities between one class of consumer as against another class, and oftentimes priorities between one part of the country as opposed to another part, those priorities reflecting the tightening of transport which is so likely to develop in a big emergency.

The third and obvious objective is to keep the production up to the level that the war requirements make necessary, and the fourth objective is to do all this and at the same time release the largest possible fraction of the man power in the industry that can be spared for service with the colors. The coal industry is still the largest single employer of heavy labor, and counting the anthracite miners there are about 600,000 men in and around the mines. By no means all of them are needed to produce war-time requirements, and the problem of releasing as many as could be spared would undoubtedly turn out to be one of the real problems of recruitment of man power in the event of a big war.

The economic setting in which the war-time control of the industry has to go on is pretty well suggested by the first of these maps (indicating map on board). There are really two of these groups, the anthracite and the bituminous coal industries, and both of them without question, judging from our experience last time, would have to be drawn into the machinery of control. You will recall that the anthracite industry is concentrated in a very small area, in northeastern Pennsylvania. It is one of the most highly concentrated industrial regions in the United States, and is not much bigger than the Panama Canal Zone. Aside from the bootlegging problem, the anthracite industry is characterized by large, well-organized units of production. It is a closely-knit industry and the problems of organizing its distribution during the late war proved to be, by comparison with bituminous, relatively simple.

On the other hand, the bituminous industry is scattered over thirty-two states. This map represents the areas of present

production, and each of the red patches is the scene of considerable present activity in the mining of coal. You are not to understand that every square mile of the colored areas is under active development, but in general terms the coal industry in the bituminous fields is indicated by those colored patches. It is a far flung industry, characterized by intense, exaggerated, cut-throat competition. Great rivalries exist between shippers in one field and another; until very recently fundamental cleavages, clashes of interest over freight rates and labor policy, largely defeated any internal movements toward industry organization. Up until the time of the World War, 1917, the bituminous coal industry did not even have a national trade association. It took a world war to bring that about. Coal mining was huge, intensely competitive, I might say an undisciplined industry, unused to collective action and not well equipped to take common counsel or to function as a unit. That essentially was the picture of the industry at the time the World War broke out.

Now, what happens when an industry like that is plunged into a great war? The first thing that happens is a runaway market. The price of bituminous coal began to jump as early as the fall of 1916, increasing from $1.14 a ton at the mines in the month of July, 1916, to $3.46 in December, 1916, and by May, 1917, it had risen to $3.72. That is, as you see, an increase of almost two hundred per cent, and all this was before any real shortage had developed sufficient to force closing of factories, schools or public institutions. Therefore, the newly organized Council of National Defense, which was created by act of Congress in the fall of 1916, found that it had on its doorstep a very urgent problem in the matter of coal supply, and one of the first acts was to set up a Committee on Coal Production. My first introduction to the coal industry was as a very junior attache of that committee. The committee had absolutely no authority to control. Its operations were necessarily voluntary. It had behind it no national organization of the industry. It did what it could, and about all that it could do was to try to seek voluntary engagements among producers that they would not charge more than a certain maximum price.

On June 27, 1917, the newspapers carried an account of the so-called Lane-Peabody agreement. It was a voluntary promise by the coal producers called together by this committee made to the Secretary of the Interior, that they would abide by a certain schedule of maximum prices. The following morning's papers carried an official repudiation of that agreement by Secretary Baker, acting as Chairman of the Council of National Defense, on

the ground that the prices agreed to were entirely too high. I mention this bit of history because it shows the emphasis on price which was so much to the fore in the early months of the war and because this difference between Mr. Lane and Mr. Baker, Secretary of War, colored the subsequent activities of the Fuel Administration when it was set up. In the meantime, consumers of coal had become increasingly restless and Congress passed as a clause of the Lever Act a provision that the President might fix the price of coal. Acting on that authority the President set up the United States Fuel Administration and called to be Fuel Administrator Dr. Harry A. Garfield, the President of Williams College. If any of you want about the most unpopular job that could be conceived, get yourself nominated the fuel administrator in an unprepared democracy. Mr. Garfield is a man of magnificent courage and character, of rock-like integrity, and he proved his skill as an administrator. He has since retired and he happens to live in the city of Washington. I think you might find it very interesting and instructive to invite him to call and tell you of some of his reminiscences of that time, not only with respect to the Fuel Administration but with respect to other problems faced by the War Industries Board.

The first months of the Fuel Administration might be called the phase of high minded amateurists. Because of the public reaction against the Lane-Peabody agreement the whole emphasis of the Fuel Administration for the first six months was directed to the question of price, and they felt rather suspicious of the men in the industry as being interested parties and tried to organize the thing largely by very well intentioned and, doubtless, competent outsiders, who were selected because they didn't know too much about coal. The prices were fixed F.O.B. mines on the basis of what information was at hand. They were much lower than the Lane-Peabody prices, and, on the other hand, plenty high enough to return a reasonable profit.

The early attempts at priorities were in many respects unwise and unfortunate. The priority power is certainly a very necessary one, but it is a double-edged one and it needs to be used by professionals. Priority order No. 1 of the War Industries Board was directed to speeding up the movement of coal via the Great Lakes. Some action of that kind was necessary, but by concentrating so much attention and effort on the Lakes trade neglect inevitably resulted in other important coal movements.

On the walls of the Clinchfield Coal Corporation's office in southwest Virginia there is a framed priority order that I have seen. It directs the Clinchfield Company to immediately send an entire winter's supply of coal to a hospital in St. Petersburgh, Florida. Now of course the hospital ought to have coal, but to give it a whole winter's supply at a time when essential industries were down to two or three days' supply was a rather sad example of inefficiency.

Dr. Garfield was quick to perceive the difficulties of the situation and to realize that he must have professional help and that leaders of the coal industry must be called in to actually carry out the broad policies which the Administration had determined on. During the second phase of its life, from about January, 1918, to the end of the war the Fuel Administration was very capably managed, and I think its policies stand out as one of the high spots of the war performance. However by that time it was quite too late to overcome all of the difficulties that had been created by the runaway market of 1917. A shortage was already in process and nothing that could then be done could avert all of the consequences. You remember the heatless days and the lightless nights and finally, I think in January, 1918, there was an order directing industrial consumers of coal to stop the use of coal for a period of several days. The immediate cause of that order seems to have been the conviction of the cabinet and the War Industries Board that the congestion of railroad transport and of the terminals at the ports along the Atlantic seaboard had reached such a point that they just had to give the railroads time out to clean it up, and coal was the largest single commodity clogging the ports and terminals at that time.

After about March, 1918, when the plans laid by the expert advisors of the Fuel Administration had time to work themselves out, things began to run very smoothly. I can praise it without embarrassment because, while I did have an opportunity to observe closely what was going on, I could in no sense claim any credit for the results obtained.

Now, how did the Fuel Administration go to work to handle the problem: As for the first objective of holding down prices, they called in a committee of mining engineers and had them review data collected by the Federal Trade Commission and set fair maximum prices, F.O B. mines, on the principle that the price must be high enough to cover the costs of at least seventy-five

or eighty per cent of the industry and that they must be periodically reviewed in the light of the supply that was forthcoming.

The second objective, distribution of the limited supply, was handled through priorities both in use and in transportation. Priorities in use were determined by the War Industries Board, acting on lists of manufacturers of munitions furnished to them by the War and Navy Departments. Priorities areally, that is, between one section of the country as against another, were determined by the Fuel Administration through its experts drawn from the trade, and were enforced largely through a system of railroad embargoes. Distress cases were handled when they related to munition plants by appeals that would come through the procurement officers of the Army and Navy. When they related to the civil population they were handled by the state administrators who were set up by the national Fuel Administration, each man being responsible for his own state.

The problem of increasing production involved, of course, the matter of labor relations. Mr. Garfield surrounded himself with a group of advisors on labor problems. The labor record, on the whole, was very creditable to the miners. The chief problem in increasing production was one of transportation. Transport proved to be the bottle-neck. The coal industry had a huge surplus of capacity and there was at no time during the war any lack of physical ability to produce coal at the mines. The whole problem was one of getting it from the mines to the point of consumption. The shortage area was most conspicuous along the Atlantic seaboard and east of the Allegheny Mountains, east of Altoona, Pennsylvania. Of course that was the great finishing shop of American industry and the consequence of any shortage in that territory would be very serious.

The problem, then, of increasing the coal supply was one of economizing on transport. The industry was characterized - and it still is - by a great deal of apparent cross hauling. This map, of which I have copies enough to pass around, shows the lines of movement from centers of coal production in each of the thirty-two coal mining states to the centers of consumption. The map represents conditions in 1924 a period of, shall we call it, normal business, not aggregated by the shortages that developed during the war and it will give some notion of the extraordinary complexity of the coal traffic. As soon as the war shortage developed consumers in remote points began to shop about for sources of supply at much greater distances than they ordinarily drew upon, and there is of record a case where a manufacturer in Long Island bought coal from a producer in Illinois, a movement that was wholly

unprecedented and that of course involved a great deal more transport effort than would be required to bring coal from the central Pennsylvania section, which was the normal source on which Long Island then drew.

The Fuel Administration attacked the problem by setting up a budget in which each producing district was given an objective tonnage to be produced and was told the areas or markets in which that tonnage should be moved. The coal fields were divided into thirty producing districts. In each district a district administrator was appointed who was a technical expert, very often a secretary or manager of a local operators' association, and whose duty it was to carry out the budget as far as the producing end was concerned. The consuming states, on the other hand, were divided into territories or zones and each producing district was given a tonnage objective setting up the volume of coal that it was supposed to deliver to each one of those consuming zones. All of this is quite adequately described in a report of the Fuel Administration on the "Distribution of Coal and Coke", and some members of the College might be interested in glancing at that report.

The zone system was worked by railroad embargoes. The budget having once been set up the railroads were instructed not to accept for shipment a movement out of the southern West Virginia field for example unless it was consigned to a point within the allocated zones for that field. The problem of special coals outside of the zone itself was handled by a system of permits. By-product coking coal, for instance used by the coke ovens and steel works of the Chicago district, had to move on out-of-zone permits and those were handled by applications through a central permit bureau in Washington. The general scheme of the zone system was to cut down the long haul movement of coal and as it were, to warp toward the eastern seaboard the areas of customary distribution which were to be filled by each producing field.

For example, and this is an extreme example, the anthracite industry was virtually confined to markets east of Buffalo, and the anthracite shipments, which used formerly to be sent to the Northwest, to Chicago, St. Louis, and beyond, and which involved heavy expenditures of transport, were virtually shut out. The result was, among other things, a permanent loss of markets to the anthracite producers which they have never felt very kindly about; but it was an example of what simply had to be done in order to make the limited volume of transportation go far enough. In the same way the

other producing fields of the country were each of them warped somewhat eastward from their customary market. The total volume of ton miles which it was estimated were saved reached astronomic proportions, and the system certainly did have the effect of aiding greatly in reducing the burden on the railroads so that the weekly output of coal climbed from eight or nine million tons up to twelve million, five hundred thousand tons, and on the day of the Armistice about sixty-three million tons of coal were actually in the hands of consumers. There was no question at that time but that the fuel problem was under control, and the country was in a position to continue the war indefinitely with the coal supply assured.

The lesson seems to be that the solution of the fuel supply was made possible by unified command within the coal industry and by unified control of railroad transport. The latter point was quite as important in assuring enough coal as the first point, and both were absolutely essential.

The fourth objective of releasing men from the mines for service with the colors did not become acute during our participation in the war. Men that were drafted were apparently replaced by the ordinary processes of employment hiring, and it was quite clear that even more men could have been spared from the mines than in fact were.

On the whole, the handling of the fuel supply, after the initial six months of muddling and lost time and after this combination of unified command in the coal industry and unified control of transport was in effect, proved a conspicuous success. It stands out as one of the high spots of the war record.

Now let me say a word about the change in business organization in the industry which has developed within the last few years since the coming of the N.R.A., and the passage of the Bituminous Coal Act and the advantages which that change would offer in time of a national emergency. With the war experience in mind, it is easy to see that anything in the direction of facilities for collective action by the industry itself would be an aid toward industrial mobilization. It is hard for an outsider to realize what a great forward step the N.R.A. coal code was. In the years after the war the bituminous coal industry had slipped more and more into a perfect quagmire of cutthroat competition. The demand had stopped growing, there was a huge surplus of capacity — you all know the general picture. It is no reflection on either the men who worked in the mines or the employers. Both groups were faced with a situation that was beyond their control.

Even in the boom year, 1929, the Federal income tax returns showed that the industry as a whole was losing money at the rate of about $9,000,000 a year, the losses exceeding profits for the entire industry. Down to that year about 3,000 mines had been forced to close. I refer not to wagon mines but to commercial mines of substantial size. About 200,000,000 tons of mine capacity had been liquidated and forced out of operation, resulting in the premature waste and abandonment of several hundred million tons of our best coals which were left under ground under conditions which make their subsequent recovery very doubtful indeed. About 250,000 men had lost their jobs. The coming of the depression made things still worse. The system of collective bargaining broke down almost completely. Miners' wages in the sourthern fields fell to very low levels, an acute unemployment situation developed, and long before the Federal Government took over any responsibility for relief in general it was admitted by everybody who knew that a special problem in relief existed in the bituminous coal fields. Mr. Hoover asked the American Friends Service Committee to undertake child feeding in the coal mining camps. Even today the anthracite region and some of the bituminous coal fields stand out as areas of exceptionally high relief load.

Therefore, of all industries in the country bituminous coal mining had perhaps the greatest reason to try to avail itself of the facilities for collective action and the agreement among producers which the N.R.A. afforded, and the code that was marked out under the N.R.A. was a great achievement. Again I can praise it without any feeling of embarrassment. While I saw very much of its operation I could claim not the slightest share of credit for what was accomplished.

Let me get the labor features of the code out of the way first. The code guaranteed the right to organize, and bitter controversies between the union and non-union fields which had up to that time pretty much stopped any attempt at national organization of the industry or common counsel among employers were swept away. A national system of collective bargaining was introduced which applied over virtually the entire industry, Harlan County, Kentucky, being the only area that remained out. That, as you know by the newspapers, has now come in under the system of collective bargaining. Minimum wages were set, and maximum hours were set, first at forty hours a week and then at thirty-five hours a week.

The marketing features of the code centered around the idea of setting fair minimum prices f.o.b. mines. An elaborate code of trade practices was developed which outlawed a number of harmful practices that had grown up in the trade, the chief of them being the habit of shipping coal on consignment before you got an order, that is sending it from the mines to the market on the chance that you might find a buyer before it reached the market. This practice had a very depressing effect on prices.

The price control rested on the idea of setting fair minimum prices f.o.b. mines. The district code authorities proposed prices, and the N R.A. administrator reviewed and approved them. Toward the end when it became apparent that the N R A. did not have the power to compel the observance of minimum prices evasions began to be serious, but I have often said, as a detached observer, that if the N.R.A. had never accomplished anything else, all the time and all the effort that was spent would probably be justified by the advances that occurred in the coal industry alone. Even before the Supreme Court threw out the N.R A. in the Schechter case a feeling had crystallized among coal operators that some form of permanent industrial organization under Federal supervision was necessary and ought to be provided for. That was the feeling that underlay the passage, in August 1935, of the original Guffey-Snyder law, which was invalidated by the Supreme Court and reenacted, with the labor features stricken out, in April 1937.

The present law has been in effect about a year and a half. Its life is limited for four years, and therefore it runs until May 1941. The law sets up a regulatory commission called the "National Bituminous Coal Commission" which I have the honor to serve. I am myself a permanent civil servant. I had looked on the service of the Government as a life job as long as I might be needed and was with the Geological Survey and the Bureau of Mines, but when this law was passed my unit was transferred "lock, stock and barrel", without consulting us, to the Coal Commission, and we have done our best to help the Commission in its difficult job. The Commission got off to a bad start. Its first prices which were issued in December 1936 were invalidated by the courts on the ground that they had been set without giving consumers a fair hearing and the chance to protest against possible inequity. The task laid upon us is certainly a formidable one. It is like that of the Interstate Commerce Commission. The I.C.C. is supposed to set a fair price on a commodity called "railroad transportation". My honorable Commission is supposed to set a fair price on a commodity called "bituminous coal." The second task is just about as difficult as the first and it has to be done under the terms of the law right away, whereas the I.C.C. had a generation to grow up and learn its job.

The law provides for a system of minimum prices, f.o.b. mines. The prices are to be so adjusted as to yield an income equal to the determined cost of production. In deference to Supreme Court decisions the law bristles with standards and instructions which tell the Commission just what is to go into the cost of production and instruct it in detail how to determine prices. Anyone aggrieved is guaranteed a fair hearing.

The chief assurance that this ambitious undertaking to set prices can actually be carried out lies in the fact that it is essentially the same approach as was attempted under the N.R.A. and that under the N.R.A. the problems of determining what would be a reasonable price and of settling the vexed questions of differential between various grades and sizes of coal were settled in a fair and workmanlike manner. The present law attempts to remedy the obvious weakness of the N.R.A. by providing a penalty for those shippers who evade the code prices. It is a very serious penalty in the form of a 19½% tax, which becomes applicable to anyone who violates the provisions of the code. However, from the point of view of industrial mobilization you would be much less interested in, what I may call, the civil or peace-time features of this law than in the developing machinery of industry organization and the facilities for collective action which are being built up. In contrast to the utter lack of organization which prevailed before the World War very great progress has been made. The industry now has an organization that is well adapted to the execution of such a task as the policing of war-time maximum prices or the control of distribution. It has developed local groups and local leadership and it has in the Coal Commission a supervisory body which is, I think, adequately staffed to settle the questions of what is fair maximum price and to review the operation of the system of control.

The areal organization set up by the law is indicated in this map. The law creates a total of 23 districts, but it so happens that one of those districts (number 21) represents the lignite of the Dakotas and the lignite is exempted by the terms of the act so that there is no organization for that district. In each of the bituminous fields proper a district organization has been set up that had a good deal of vigor and authority. Each district has a District Board of Producers. Half of the members of the board are elected by vote on a tonnage basis of the producers in the district and half of them by vote on a numerical basis. In voting on the mumerical basis the smallest producer's vote counts as much as that of the Pittsburgh Coal Company. There is also on each board a labor member designated

in practically every case by the United Mine Workers. Most of the boards have competent permanent secretaries and a record office. The functions of the district boards include the classification of the coals of the district, the proposal of fair minimum prices to the Coal Commission, the coordination of such prices between one district and another, the checking of observance of prices when in effect, and the arbitration of disputes that arise among their membership. Each district has a statistical bureau created by the law which is an arm of the Commission, and therefore of the Federal Government, and the bureau's duty, among other things, is to keep records of cost and distribution for that particular area. All producers are required to file current cost reports and to file copies of all invoices on the sale of coal. This has built up a large amount of basic information regarding the flow of coal from each district sub-divided, not only by area but by use, which would certainly have been a God-send to the hard-pressed statisticians of the original Fuel Administration in outlining their coal budgets and their zones

One of the most important tendencies that has developed under the law and which traces back even slightly before the N.R.A. is the growth of regional marketing associations or agencies, best represented by Appalachian Coals, Inc. Appalachian Coals was the first of these agencies to be developed. Its headquarters are in the southern high volatile fields. It began before the National Industrial Recovery law was passed, and received the official blessing of the Supreme Court in a decision handed down March 1933. Since then, and especially during the last six months, other marketing agencies have been promoted in many of the other fields. They seem to have a very useful and legitimate place within a system of Federal regulation as well as in an otherwise unregulated market, and I think it is a fair guess that we shall see a great deal more of such marketing associations and that in the course of time they will not only handle their own local problems and achieve a greater degree of stability among shippers competing in a single district, but that they will increasingly deal with one another. I think that the marketing agencies alone would prove to be an important forward step in any problem of securing the necessary unity of planning and execution of policies in the event of a war.

As to the Commission itself, it is a fair guess that despite the fact that its life expires officially in 1941, some form of Federal Government supervision of the industry is likely

to be adopted permanently. I would feel -- I shall talk very frankly -- quite sure that there would be important modifications in the present law. But I think that, if from no other point of view than the experience of other countries, the days of entirely unregulated cutthroat competition in coal mining are over. Some departure from the old dog-eat-dog type of competition is certain to emerge as a permanent feature of national policy. That seems to involve a measure of collaboration by the Federal Government.

While the principal task of the Coal Commission is to fix and police minimum prices and to prescribe marketing rules and regulations, the law also contains the provision that if at any time prices rise to an unreasonably high level the Commission is to set maximum prices, therefore we already have on the statute books the authority to control run-away prices which in the late war had to be especially enacted in the Lever law. The law says that these maximum prices shall not be fixed so as to deprive any individual shipper of a reasonable return on his investment. That might conceivably mean that the maximum set for one mine would differ from the maximum for other mines producing a similar grade of coal in the same field.

The provision of the Coal Act authorizing the setting of maximum prices would appear to provide automatically for the first of the necessary objectives that I sketched in the event of war-time control, and there can be no doubt that the detailed records, the distribution and uses of coal which the Commission is at present building up, and the technical competence which its staff is acquiring, would all be of the very greatest use in habdling questions of wartime distribution and priority. They would for example enormously facilitate control of distribution by budgeting and zones such as that of the late war.

I might say a word also about the question of man power in the coal industry. At the present time the capacity of the bituminous mines operating with their existing labor force on the thirty-five hour week is approximately 576,000,000 tons a year. If the policies of the next war-time administration will permit lengthening the weekly maximum to the old forty-eight hour week, the mines now in operation would have a capacity of 680,000,000 tons a year. The anthracite mines, I presume, could easily produce still another 70,000,000 tons a year. The total number of men now on the payrolls is about 485,000 in the bituminous fields. Add to that another 100,000 in the anthracite field. There seems no doubt but that in addition to miners now

unemployed there would exist a considerable potential reserve of man power on the rolls of the operative mines in the event of war, if the question of limitation of hours of work can be amicably settled.

Discussion

"The Coal Industry"

Mr F G Tryon

October 7, 1938

Q -- To what extent has the bituminous coal production over the past few years been affected by the increased commercial use of the petroleum products of natural gas?

A -- That has been one of the major issues In 1937 our annual demand was in the neighborhood of 40,000,000 tons, up to 1929 it had averaged about 530,000,000 tons At no time has it reached the levels that were attained during the war when it shot up to about 575,000,000 tons I would rate the factors that have been responsible for the change in the demand for coal in about the following order: First, fuel economy The war drove up the price to heights that accelerated a tendency that had been in evidence a long time before to get more use out of the same tonnage of coal but the tonnage was accelerated enormously In the electrical utilities it was the emphasis shifted to full efficiency and ambitious men discovered the route to promotion lay through the boiler room and they made savings quite spectacular The average consumption per kilowatt hour was, in 1902, something like 6.4 pounds, by the end of the war that had been cut to 3 5 pounds and now it has been still further reduced to 1 4 pounds Fuel economy is an old story and goes back to the days when James Watt was inventing the steam engine, but there has never - probably in the whole history since the industrial revolution - been a period when improvement in average performance in the utilization of fuel has been as rapid as it has

been in the years since the World War I rate that as one of the factors in the changed outlook for the demand in bituminous coal Next to that I would put competition of other sources of energy, that competition is not confined to the direct displacement of coal by fuel oil burned under a boiler There is a certain measure of indirect competition in the form of gasoline, because while it is quite clear that if we had not had cheap gasoline in the internal combustion engine we would have gone ahead and developed subsidiary methods When we have been through a great increase in electric light, propelled motor vehicles, and a great increase in light railways or extensions of electric traction, I think that even that part of the production of oil which finds its way to the ultimate consumer of oil will not affect us greatly Gasoline and kerosene involves a certain element of competition and in the aggregate that has been a powerful question Gas and oil have been more important than has hydro power though that too has made its contribution Then there has been another tendency resulting from the - I call it - coming of age of American industry This is a country that as it matures in economic life the tendency to shift its emphasis over from the products of heavy raw materials of heavy industries to more highly fabricated goods may involve larger capital increases and quite as large quantities of labor but they tend to require less in the way of raw fuels and then there has been a shift from raw pig iron made from the ore to scrap iron The iron furnaces are, next to the railroads, the largest single comsumers of coal in the form of coke and the increasing tendency to re-use scrap in place of producing virgin pig from the ore has had a powerful effect on the demands for coke and coal and that is one of the

reasons the total consumption has tended to lighten off instead of increasing as it used to On top of this, of course, came the great depression and the decline in industrial activity which is reflected in coal mining as everywhere else I believe that the coal industry - that is, the producers - had set up a type of research organization which had for its purpose to endeavor to find new uses for coal

Q -- Can you tell us what success they are having along those lines?

A -- Not as much as they expected and I would say that while praiseworthy as the effort is, it is not organized on a scale adequate for the problem, that is one of the things evidently that happens to an industry which gets into a state of acute depression and where responsibility is divided among many thousands competing as units No one producer can afford the expense of research which will go down to everybody and it is exceedingly difficult to pass the hat and collect enough funds jointly to carry out research of this type on the scale desired The National Coal Association which is the national trade body for the industry, has organized bituminous coal research and they - an entirely non-profit corporation - have done what they could to raise funds All of the efforts they have made have been intelligently directed and decidedly worthwhile and it has produced some results but is obviously effort which ought to be multiplied many-fold and I have looked with some hope on the attempt to organize the industry on a stronger and more stable plan economically as one of the ways by which funds adequate for research might be developed

Q -- Mr Tryon, it is true that the Bituminous Coal Act of 1937 provides that no coal shall be purchased by any Government agency from a producer who has not ~~been~~ accorded the right to employees to bargain

collectively What effect does that have as far as the price of coal to the Government is concerned? I realize, of course, that the coal furnished the Government is a small drop in the bucket to coal used commercially

A -- I imagine that has little effect I expect it was written into the law by organized labor and wanted to show every possible prop to their system of collective bargaining So far they have been able to hold the lines in virtually the whole industry The Government doesn't have much option whether to buy from a producer operating under collective agreements or not unless it is prepared to take coal from the small truck mine There are very few rail-connected mines now outside of the system of collective agreements.

Q -- How do the laborers feel regarding the National Bituminous Coal Act?

A -- They were strongly for it and I presume they are responsible in a principal way for the support that led to its passage The opinion in the industry after January, 1935, when the days of the NRA were known to be expiring, was divided Almost everybody agreed that something ought to be done, that the former code had been a tremendous advance The miners felt then that they wanted a special coal act and I think they wanted it on a permanent basis The employers were divided into two camps - the thing to do was to go along under the NRA code and those who felt that the time had come to have a special law The law was first discussed about February, 1935, and immediately after the decision outlawed the NRA the point among employers crystallized on the side of a special Federal law I think that at the present time it might be fair to say that the

attitude of the employees is one of expectancy and somewhat skeptical hope They are aware of the complexity of the job facing the commission and they are disillusioned as to the time it has taken to carry out the intention of the law So few of them are definitely opposed and they begin to see the law fail Most of them would like to have it succeed and they are giving very loyal support

Q -- What is the comparison percentage between the contribution to the power demands of the country between coal and petroleum? Can you tell me that?

A -- If you take the entire budget of the United States, it consumes energy in all forms, including that which is used in gasoline and internal combustion engines The proportions are as follows 1937 - Pennsylvania anthracite - supplies 5 4 per cent, bituminous coal - 45 per cent, the two coals combined are just a trifle over half - 50.4 per cent, petroleum supplies 30 4 per cent, natural gas, 9 8 per cent, water power, 9 4 per cent Those figures ought to add up to close to one hundred per cent That takes all of the oil and gas regardless of how it is consumed and all the water power, counting water power as its equivalent in fuel as a relatively low thermal efficiency A great deal of that known coal energy is not directly consumed With coal it includes water power in areas where coal is difficultly accessible and where hydro is clearly the cheapest and best way to generate power It includes this very large fraction of oil and gas products in the form of internal combustion engine fuel If you disregard the automotive engine which has now become one of the greater consumers of energy and think of the electric utilities themselves, my recollection is that coal supplies about 88 per cent of the total fuel

generated power and the other 12 per cent is partly fuel oil and partly nitrogas and partly Diesel oil The portion of the total public utilities power supply contributed by fuels is about 60 per cent and the portion from water power is about 40 per cent Of course, coal remains the one source of coke and therefore it still is and will have to be the basis of industrial pyramdds of heavy industry in which the munitions industry is at the top

Q -- You mentioned the closing of sources of bituminous coal Would a national emergency require the re-opening and possible un-economical operation of any of those abandoned mine products?

A -- I think that would raise one of the most real problems In the event of a war, first the price will go up, that is Postulate No 1 The Government sets maximum prices As prices go up, more mines will tend to come into production Now a wise administration would think a long time before it authorized the opening of new mines and the consequent diversion of man-power I don't know where the American constitutional division of power between the States and the Federal Government really lies or whether it has any authority for the prohibition of the opening of a new mine, but a great deal could be done through control of priorities in the supply of steel and material to discourage the opening of new mines and in my opinion the present capacity - if the men will agree to return to 48 hours a week - is all that we are likely to need For a rather big war, that is We should think twice before encouraging any more mines

Q -- Mr Tryon, our fleet is entirely propelled and practically all the ships that we are building will be by fuel oil In case of a national emergency the demand on our fuel oil reserve and resources is going to be pretty tremendous Is there any way of substituting pulverized coal for fuel oil?

What plan has been made for pulverizing coal and substituting it for fuel oil? Also I have another question - I want to find out whether there is any system of control or whether they can control the anthracite industry in Pennsylvania?

A -- About the substitution of pulverized coal I suppose that in land installation that is just a question of capital expense Quite a number of the modern central stations located in places where fuel oil is the potential competitor have been designed with the thought of being able to switch from fuel oil to coal or gas or back again and there the change can be effected with relatively small expense In other places it is just a question of spending enough money on it I think that a very considerable b[illegible]age of fuel oil could undoubtedly be released in a short time by wartime control through encouraging such changes One of the things that would do it would be a higher price for fuel oil, that alone would effect the rather wholesale convergence Now you get into transportation As far as the railroad locomotives are concerned, there is already a considerable degree of flexibility in this sense That means that mines operating both in coal territory and oil territory have both types of equipment and that the particular divisions are run on oil opposed to coal, depending on the comparative prices of the two There would be some switching from one to the other - possibly in the railroad fuel Without very much extra cost the change could be effected You get beyond that point of using all of the available locomotives destined for coal and the question involves new capital changes In marine transportation, there have been successful experiments in the use of pulverized coal for marine use The Shipping Board tried it - and there are some records of those tests on the Steamship Mercer

some years ago It is possible to drive ships at sea by the use of pulverized coal There is some question as to whether it is more efficient or economical than the ordinary stoker firing I know so little about the particular conditions of consumption at sea that my answer will be worth very little My opinion, however, is that it would be a pretty difficult matter to change a fuel-burning vessel to a coal-burning vessel on short notice

You asked about bootlegging in the anthracite region There are thousands and thousands of little mines shipping by truck that are operating very much the same way as the bootleg holes in the anthracite region out in the bituminous fields but most of them are perfectly legitimate businesses A group of men with not much to do will persuade a farmer to let them open a hole on his land and pay him royalties or a little something and set up in business as producers of coal, they put out a sign along the road and wait for a trucker to offer them such cash as they see fit and then let him have the coal for what he is willing to pay them There earnings are usually pretty small - I suppose there are probably 5,000 or perhaps 6,000 or 7,000 producers of bituminous coal like that, varying in size from 150 to 15,000 tons a year They constitute a problem very much in evidence in any attempt to regulate prices because the producers, like everybody else, have got to place in the picture the aggregate tonnage - which might be 15,000,000 a year It is increasing and in many markets it is quite sufficient to break the system of price-fixing The bootlegging, as such, is virtually confined to the Pennsylvania anthracite region The bootlegger is a trespasser operating on the lands of a corporation who doesn't want him there He is largely a product of unemployment and he exists because

there is so much unemployment and public opinion in the anthracite regions has lined up against the companies anyway The local police force won't convict the bootleggers The local merchants are dependent on the bootlegger They don't quite know what he'd do if he didn't have this sort of a job and it has proved exceedingly difficult to the police That is my way of condoning a simple trespass I think it is a fair prediction that bootlegging would disappear if employment were turned to more normal levels and a man could get a job The stories about their earnings are on the whole untrue They work under conditions of very great danger, they work long hours very hard and probably make 2 or 3 dollars a day more often than they do 5 dollars The tonnage of the bootlegger seems to be declining At one time it was thought to be between 4 and 5 million tons a year and that meant a tenth of the total anthracite market came from the bootlegger It is probably 3 million tons a year now The decline is due largely to the exhaustion of the more easily worked ground He can't go very deep and the accessible places are less easy to find and dig in The situation used to be more important than that The success of the local retailers in cities where bootleg coal is being trucked is waning In getting local ordnances they put some kind of a tax or license charge on the trucker, making it more difficult for the trucker handling the bootleg product to make a local sale But as I say, I think that the matter will remain a thorn in the flesh as long as there is very widespread unemployment and it would probably clear up like a bad finger if we got back anything like normal volume of employment and normal wage scales

Q -- Mr Tryon, if the consumption of bituminous coal remains approximately constant, can you give an approximate figure as to how long the

present known supply of coal will last?

A -- If you take the total tons that the geologists say are underground and divide by the total number of tons that are now being produced at something like 1929 rates and make a little allowance for loss of coal in mining, you get an answer of something over 4,000 years Now that is one of the most deceptive figures quoted about the American scene The reason for the deception is that it overlooks the great outstanding fact that products always start on the richer and more accessible minerals and it tends to move progressively to the lower grades of ore or to mining conditions that are more difficult and more expensive The prospective metal mining industry starts with rich strains and in the course of a few generations you have had a very conspicuous decline in the average grade of ore to be worked Coal mining starts on the best deposits - the cleanest and finest coal, if you look at those really prize coals The rate at which they are being used up has presented an entirely different picture The Pittsburgh bed, which is the greatest storehouse in the world, will last about 100 years in the State of Pennsylvania at 1929 rates of production The beds in the Pocahontas New River area have a thickness which is regarded at 1929 rates as having a life of about 84 years There is a lot of thin coal out there which might easily double that expectation of life but even that is limited Our coal consists of relatively small amounts of the best quality coal and unbelievably big amounts of the low grade bituminous ore or sub-bituminous or lignite The rate at which we are using up the cream of our coals is measured in scores of years and anything that we can do to stop the waste of those coals and prolong their lives is very much to the point In other words, the share of abundance

of coal sources in the United States has created a great problem in conservation by making everybody careless about the waste of mining and by concentrating production on the relatively valuable coals If we had an all-wise economy we would try to save these high grade metallurgical products for coke and cooking purposes and discourage their promiscuous use for ordinary steam-raising where a cheap coal will do just as well

Q -- I have a question on the unemployment in the mining industry To what extent is the present condition resultant in acquiring new types of jobs?

A -- There is another element in that, of course The number of jobs is something that is rather independent of the number of applications for the jobs and that is the number of jobs, in other words, it is not particularly affected by the number of people that would like jobs but the number of men who hang around the mining communities and would like work is partly affected by this immobility I think this might be described as relative immobility on the one hand You certainly have a feeling that the miner is attached to his way of life and has learned one thing and he isn't very well adapted by experience or training for other occupations Some types of employers have a feeling that he is not suitable for industrial work and will give preference to men with machine shop experience rather than coal miners There is a saying that the miner can't stand the sun There's a great deal of truth in that and it takes time for them to become accustomed to heavy labor in the sun Miners live in isolated communities They have a certain clannishness They lack experience in the outside world and that has operated along with these other factors to delay migration and readjustment But on the other hand there is the plain fact that hundreds of thousands of men did leave the mines after the war peak and did find something else

mechanical work performed That offered a very fertile field for inventive genius and there appeared during the 1920's a surprising variety of machines designed to replace hand labor by various types of mechanical devices Where the mining conditions are applicable and favorable, mechanization of that type is growing by leaps and bounds It depends partly on the wage rate If we got into a war one of the characteristic commodity prices would rise and the incentive to mechanize would be increased I think we could be quite sure that employers would accelerate mechanization and this would have the effect of releasing more man power than otherwise would be possible, but I suppose that if as many as 5 per cent of the working force were released within a period of a year that would be as much as you could count on, if it went as high as 10 per cent, I should be surprised

Q -- A number of years ago I noticed that there was lots of foreign coal brought into the United States as ballast Has the coal commission been able to anything about that?

A -- They study exports and imports but I don't recall that anything in particular has been done about it The total amount of coal imported is awfully small except for anthracite from Russia and Germany The imports are not more than a couple of thousand tons from the western Canadian provinces that come down into Montana and Idaho and Washington

Colonel Riefkohl I am sure we have benefited very materially from this little talk and it has certainly added a great deal to our fund of knowledge On behalf of the College I want to thank you very much, Mr Tryon