

YOUNGSTOWN STATE UNIVERSITY

ORAL HISTORY PROGRAM

Clay Industry

Personal Experience

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ROBERT WINSLOW

Interviewed

by

Thomas Hess

on

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H. This is an interview with Robert Winslow for the Youngstown State University Oral History Program, on the Clay Industry, by Thomas Hess, on November 29, 1976, at his office at the Crescent Brick Company

One of the big problems that every industry is faced with right now is energy We know that energy is important in the Clay Industry, so I would like for you to tell us what restrictions you have on your company and how you are working to come around those particular restrictions

W Well, I have been here since August of 1968 Probably from that date until the fall of 1974, we had been warned and warned again by the gas company that there was a natural gas shortage coming On November 1, 1974, our first curtailment came about officially November through March represents the five-month winter period as set up by the gas companies We were curtailed fifteen percent that November, thirty-five percent in December, and fifty-five percent in January The fifty-five percent was to continue through February and March; however, a group of the large industrials banded together, and we took it to court and to the Public Service Commission, and it was reduced to fifteen percent for the remainder of the winter In the state of West Virginia at that time in 1974, approximately eighty-eight customers bore the brunt of the entire gas shortage In other words, eighty-eight of the largest industrials picked up the slack for the whole state. In other words, a twenty-five percent curtailment to the state or, more specifically, to Columbia, West Virginia would mean approximately a fifty percent curtailment for the eighty-eight large industrials We felt at that time that this was discriminatory A few of us felt at the time that maybe there was no real gas shortage I think a few still feel that way A new plan was devised, and we are now on a curtailment plan based on in-use, rather than a straight percentage In other words, your gas is curtailed depending on how it is used

Many things have been done prior to the gas curtailment, and they are being done now at a more rapid pace In an attempt to find ways to conserve gas, many companies have switched to alternate fuels, for example, propane, fuel oil, and coal Coal is now coming back. In fact, another legal brick man who manufactured in Newll, West Virginia, globe factories, a division of CE, is firing a portion of one of their tunnel kilns that pulverize coal. Do you want me to keep dwelling on this natural gas thing?

H Yes

W: There have been some questions in my mind, and I followed this gas thing pretty close If the shortage is really a shortage, the number one question is when the gas company advises me of my curtailment level for a coming winter period, immediately thereafter, they send me a letter offering me what is known as "Emergency Spot Purchase Gas" in the amount equal to the amount I have been

curtailed. For example, this winter I was curtailed approximately fifty million cubic feet. If I desire, I can purchase another fifty million to replace that at about twice the price. Now, if they are coming up with another fifty million cubic feet, that means the gas is there someplace. So, possibly the shortage is not as severe as we think. Maybe it is just a problem of poor regulation by the federal government.

In other areas where experimentation is going on in efforts to conserve fuel, is the area of high temperature? We have done some experimenting in this area. We are experiencing some fantastic savings. We plan to do more of the same. The real answer for my particular plan is the installation of the tunnel kiln or continuous kiln which would reduce the gas consumption per unit produced tremendously.

H Let's interrupt and back up and take a couple of items that you have already just brushed here. You say that there is a new method of figuring how much your allocation is going to be based on what you use it for. Is that your idea?

W Prior to the curtailment period in a plan set up by the state Public Service Commission, your gas is categorized. In other words, what percentage is used for space heating, what percentage is used for plant protection to keep things from freezing or water from freezing or so forth. What percentage is used in actual process? What percentage is used in motor fuel? Motor fuel has certain size boilers' large boilers are the lowest priority. As an example, boiler fuels of the largest size in West Virginia are placed in category five. When the curtailment started on November 1, all of category five was curtailed one hundred percent.

H One hundred percent?

W Right. The next category might be boilers of a slightly smaller size. I am getting these from memory. One hundred percent of that category was curtailed.

H As of the first of November?

W Right.

H Just arbitrarily, they did not get any more gas?

W No.

H And this is established by what agency?

W Public Service Commission. The guidelines for the in-use plan as it is called,

were set forth by the Federal Power Commission. However, they did not specify exactly large volume boilers should be in category five. You could set the plan up any way you wanted it. But some type of in-use plan was recommended. Boilers are in a low category because it is generally considered that an alternate fuel to a boiler is much easier applied than other applications. When you get to category three, you get into processed gas which is gas that is used in processing your product which could be rather easily substituted for. As of November 1 of this year, all of category three was curtailed one hundred percent. In my particular situation as in many others, the majority of my gas is in category two, which means at the time this plan was set up, we assumed that we could not use an alternate fuel.

H But in category two, they could make available to you at this premium price?

W No, we are just talking about the regular gas right now.

H Oh, the regular gas.

W Then if you go on up the list of priorities, you get to priority one, which is in a sense residential, commercial, schools, hospitals, etc. As a result of most of my gas being in category two and only a small amount in priority three, I ended up with about a fifty percent curtailment for this winter. Now, of that fifty percent remaining, I can use it any way I choose during the five months. I can use it all in a month and shut down, I can use it in three months and shut down, or I can use it piece meal and try to keep the plant operating on a lower level for the entire five months. We did buy a portion of this emergency spot purchase gas, so that we now have enough along with our remaining allocation to run approximately three months. Then we will stop and repair and put lots of work in it.

H Okay. Then the next question that comes to mind are these alternate fuels. You say that in the Clay Industry, there can be applications of fuel oil.

W. Right.

H. And of this powdered coal. How does the use of these alternate fuels affect your cost per unit of production?

W As of the past spring, which would be the spring of 1976, we experimented with a kiln in one of our other plants with oil. The kiln was equipped with a pressurized burning system, and it had dual fuel burners. So then it required the changing of the nozzles and the addition of more plumbing. We found that the end product was almost identical as if fired with gas. The cost was just doubled.

H Just doubled?

W Now with the gradual increase of natural gas even from this spring to the present, the cost probably is not doubled now. But I think what is going to come about if this energy shortage continues, it will not be how much of your brick, it will be how many do you have. So, maybe cost is not the controlling factor anymore.

H But you mean because of the curtailment of the fuel to make the brick, there is not going to be any abundance of brick on the market, right?

W That is very possible

H Now, in your particular case, you are talking ladle brick, are you not?

W Right.

H Ladle. Any furnace brick?

W. No

H Just ladle brick, okay. So you are very closely connected with the steel industry?

W Correct.

H Now, how is the steel industry's supply of gas affected? Or is the steel industry as dependent on natural gas as you are?

W Maybe not as dependent as we are percentage wise. For example, the old open hearths, they were fired with what they called "bunker C" oil, which is an extremely heavy oil which has to be heated before it can flow. Weirton Steel, I believe for the same winter period which is now where I have been curtailed roughly fifty percent, they have been curtailed about seventy-three percent. Of course, they have substituted oil, they have started utilizing some of the waste products that they used to just vent to the atmosphere, such as coke oven gas, which has a much lower BTU rating than natural gas, but from the standpoint of a well-hit price, it is free. It is automatically manufactured, so you might as well pipe it and use it. Weirton Steel, I know according to the papers, has experimented with drilling wells with not much success. I am not sure what their alternatives are going to be now, but, yes, they are very dependent on gas also.

H So, the two industries just kind of ride together here as far as the energy crunch is concerned?

W Right

H. Now, you started to mention an insulation application. Would you expand on that just a little bit? What are you insulating?

W Well, at this particular plant, we have the old periodic kilns, the little round ones that many times are referred to as beehives due to their appearance. They are called periodics because you place the ware in the kiln, and you light it and fire it and shut it off and cool it and take the brick out and just recycle it, hence the term periodic, which is in itself, a very inefficient process because you are wasting heat by heating up a cold kiln, and you are wasting heat by cooling off a hot one. Most of the kilns are built with brick. The crown which is semi-domed shaped, is all made with insulated fire brick. The inner walls of the later kilns are made either with insulated fire brick, or they are cast from an insulated cast mold. The very fact that they are made from many thousands of individual pieces only adds to the problem which results from heating and cooling many times that you get cracks and openings. It is a known fact that any insulation, no matter how thin, is bound to help. The product we are experimenting with is made by Carborundum, who, by the way, makes the same products for other companies who restyle it and mark it under another name. Stainless steel anchors are installed in the interior brick work, and the insulation is just punched over it. Then a little ceramic cap is installed over the stainless steel. You have not only insulated, but you have also closed any cracks that may have developed over the years.

H What kind of efficiency improvement do you get here, again?

W Well, our first trial here, we put along with a recommendation with the Carborundum people, and we went with an adhesive rather than with the anchors. It looked exceptionally good for the first two firing. Then it came off. Our Altoona plant expanded on this, and they put two layers on using the stainless steel anchors. The first couple burns, if two burns would not be considered inconclusive, they showed an average savings of fifteen percent.

H Fifteen percent?

W Right

H The cost of application to make this sort of thing prohibitive on a rod scale application?

W No. He figures that if he continues to just rate, he will have paid for the job in about one year.

H Will it give that same efficiency in the summer time when you do not have any curtailment?

W Oh, yes

H Does that savings that you might affect in the summer time affect the amount of gas that you would have available to you in the fall?

W No The existing Public Service Commission plan disallows any credits to be accrued So it pays you to use all of your gas not necessarily in each given month, but in each period, the five-month winter period, and then the subsequent seven month summer period

H Now the natural question might be why not make brick like crazy in that seven-month period and stock pile a goodly amount of brick to go through the fall Is there an unlimited amount of gas in the summer time, or is your energy limited to some extent in the summer time too?

W Well, let us look at the past summer as an example We started off in April, which is the first month, at a fifteen percent curtailment which continued through May and June. The first of July, the curtailment was lifted By the middle of July or there abouts, we were told by the gas company that we could have all the gas that we wanted over and above our allocation for the remainder of the summer

H So it would be impossible to plan ahead You could not figure as of the first of April that you are going to have unlimited gas and be all geared to really make brick then?

W. You could assume that probably with a fair degree of accuracy, but here this summer, the fifteen percent hang with us three months

H Was there some seasonal or climactic reason for this? For the fifteen percent hanging on that three-month period

W They claim that once the winter heating season is over, they needed that time to, they needed that curtailment to store up gas in what storage facilities they have in the state Here again, I think this is part of the problem For example, if Columbia, West Virginia had excess gas this summer, which apparently they did because they offered it to their customers They tried to get estimates from their customers so they could tell their supplier how much of this excess they wished to buy. If they did not use all that they bought or if they did not buy all that they could, they also were susceptible to the same rules that the individual customers were, that they cannot have carried over Now here again, if more storage space

was available, it is possible that they could buy more of this gas and store it. Now they have some storage space like underground caverns and so forth. But I am almost convinced that maybe part of the problem is storage, as well as supply.

H The third area that you got into before I interrupted you was alternate production methods. You started to describe a different kind of kiln. Would you go ahead with your continuous kiln or your continuous kiln or whatever it was.

W Well, really today it is the only way from the standpoint of efficiency. In other words, a continuous kiln is just that. It is continuous. You put brick in one end on a large car, and they very slowly move through the kiln. The kiln is never shut off. It never cools. There is no wasted energy used to heat up a cool kiln. The waste gases, the waste heat as it is referred to, from the tunnel kiln is diverted into a dryer. So you are drying your brick at theoretically zero cost. For an example, probably a good figure for firing ladle brick is gas consumption per unit produced, is about fifty percent of what it takes in a periodic kiln.

H Just about half of what it would take in a periodic kiln.

W Right.

H What kind of an initial investment are you getting into, though?

W Probably today, a minimum of \$1,200,000.

H Would this give you the same capacity of production that you have in your periodic kilns? How many periodic kilns do you have here at this works, for example?

W Sixteen.

H Then it would take one million and a quarter to give you one continuous kiln that would replace those?

W I do not think that we could replace all of them, that capacity for \$1,200,000. For example, we put on in our Clearfield, Pennsylvania plant that started operation two years ago this month. It is not one of the larger ones, and the capacity of it is about 20,000 bricks per day. Whereas normal production at the Clearfield plant, using all of the periodic kilns and not the tunnel kiln, was about 60,000 bricks per day.

H So they would have needed three of those at that size any how?

- W Right
- H And that is the \$1,200,000 investment?
- W That is right
- H. You are talking about a lot of investment there Is it economically feasible?
- W Yes, I think so I think with the savings involved When you look at your savings Let us say you are saving fifty percent, that money could probably be returned in a couple of years
- H Not only do you get an efficiency in your fuel that is involved, but it would appear to me that you would have some efficiency in labor also, would you not gain in this? You would load them on a cart and they go through and come right out on the same cart There is no filling of the beehive and then emptying of the beehive by hand labor, is there?
- W That is correct. Presently we have three crews here who are what we classify piece workers They get paid by the thousand Those are the people who make the brick and also the people who set the brick in the kilns, and the people who draw the kilns You would eliminate one of the first two steps In other words, the people who make the brick are referred to as hackers, and the people who place the brick in the kilns are referred to as setters So that operation would be combined They would be taken from the press where they are made and set them on the car, and that would be the end of it until they took them out of the kiln. Another gain is you would have less kiln losses because of, number one, more uniform burning. In a periodic kiln, we have to set brick over and around the draft holes in the floor These bricks are automatically lost They are going to be seconds or calls when they come out You do not have this in a tunnel kiln I have heard people say that the average loss in a tunnel kiln is about one half of one percent
- H What do you figure on a periodic kiln?
- W We figure three to four percent is about optimum
- H. So you are going to have quite a savings
- W Right
- H: Certainly management has done some long-range projecting What way does hole the most optimism for you getting out of this particular energy crunch?

W Well, there are several ways to go. If we would look at my total yearly allocation at this particular plant, we would say that theoretically we could save half by firing at a tunnel kiln. Then we could figure that I could be cut fifty percent for the whole year and still maintain my present production. The second way is to go with a different burning system on the existing kiln which would be a pressurized burning system where the air is forced into the kiln rather than being drawn in through the burners. Of course, the third one is an alternate fuel. I would guess that the alternate fuel would be out at this installation due to the initial cost.

H the alternate fuel being either oil or coal, right?

W Right

H Now that coal that they are using is a powder coal?

W That is right

H And they are using that in conjunction with the tunnel kiln?

W Right. Tunnel kiln is divided into various zones. As you enter the kiln, you enter a low temperature zone then a moderate and then your high temperature zone and then your cooling zone. In one of these zones, I do not recall which one, they are fired with coal. It is pulverized, and it is blown in much the same as the power plants do.

H Now your location here in flood circumstances, do you get water up here in your plant?

W: It used to be, I think, a regular yearly occurrence. I have been here since 1968, and we have had it once.

H That was when Agnes came.

W That is right

H Would this give your tunnel kiln more damage than what it perhaps does to a beehive kiln? You are getting a lot of investment there. What happens where you submerge a \$1,200,000 kiln?

W Well, assuming that it would be no worse than it was in 1972, with a tunnel kiln, we would probably fair better than what we did with the periodics. A periodic kiln, your entire flue arrangement is beneath the floor. Naturally, when the flood came up, all of the flues filled up. We lost about three bottoms at that time. Of

course, they were old to start with, and the water just finished them off. In a tunnel kiln or continuous kiln, you have nothing below the floor. Everything is within the kiln or above. So that would not be a problem.

It is my opinion, and I have been very close to this gas situation since the start in November 1974, that more gas is available than is being made known to the public. The one example I gave is that, even though my gas is curtailed, if I wanted to pay double the price, I could buy that much back again. Theoretically, what they are selling me is intrastate gas, which is different from interstate gas in that the price is not controlled by the federal government on interstate.

H: Okay, and they sell the intra at the high price? Is that the idea of West Virginia produced gas?

W: No, we are talking about Oklahoma and Louisiana and Texas produced gas. A special ruling was handed down by the Federal Power Commission which made it possible to make his gas available in an emergency situation. Legally, and maybe technically, this is a violation of the law in that the intrastate gas is now becoming interstate gas because it is going through interstate pipelines, yet it is being sold at an unregulated price. This was taken to court and tested. The Federal Power Commission was relieved of any responsibility of breaking the law in that it was an emergency measure. Which brings us back to maybe the root of the problem in that the regulation of interstate gas is such that the people who own productive wells would rather cap them and sell them on the intrastate market. For example, if you owned a gas well in West Virginia and you had enough money that you did not have to worry about if it was producing every day, it would be to your advantage to maybe cap it and wait, hoping to sell it within the state rather than putting it into the interstate pipeline at a much lower regulated price. Also the fact that in January of 1975 when the group I spoke of earlier banded together and took this curtailment to court and eventually to the West Virginia Public Service Commission, the final rule was that the fifty-five percent curtailment would be reduced for the remaining two and a half months to fifteen percent. So my question is, where did all that other forty percent come from? You cannot produce gas from a federal court ruling. So I am becoming a bit of a nonbeliever. I am sure that there are others that believe as I do.

H: Is there some agency that is working for industry to try to uncover the facts in this particular dilemma that you are describing?

W: Well, I can only speak for West Virginia where we now have a group in existence which is protesting in person the new proposed rate increases by Columbia, West Virginia. Their proposed increase, which was to take effect on October 18 of this year, was thrown out by the Public Service Commission. The reason that we were protesting is the differences the rates were going to be for industrial as

compared to residential customers. Our thought is that the amount of money that is invested per unit delivered, our rate of increase should be lower. For example, they might deliver 25,000,000 cubic feet through my one meter every month. Where in my home, which would be residential customer, they may deliver five cubic feet through one meter every month. In terms of service, it almost requires an equal amount. So we do not feel that a large customer should be penalized to a greater extent than a residential customer or the commercial customer. I am sure that if any more problems arise with the curtailment plan, the group would go back again.

H: Is there a name for the group? Is it identified?

W: No. Well, in the original hearings in the winter of 1975, we were referred to as Weirton Steel et al.

H: Oh.

W: And, of course, in addition to our group there were many individual companies there representing themselves. The biggest one in the state is Dupont at Bell, West Virginia. Weirton Steel is the second largest consumer, but Bell is so far out in front, it staggers the imagination with the amount of gas they use.

H: Now you mentioned that your company has plants in Pennsylvania. Is the regulation placed on them similar to the regulation placed on you here?

W: This is my third winter of gas curtailment. The first winter was from 1974 to 1975. None of the three plants in Pennsylvania were curtailed. Last winter, the one plant was curtailed approximately thirty-three percent. This winter that same plant is curtailed seventy-three percent. The other two plants, not at all. The reason for this difference is that those three plants are each served by a different gas company. All those three gas companies are wholesale customers of Columbia Transmission Company which in turn supplies all of the sister Columbian gas companies. Ohio, Kentucky, West Virginia, Pennsylvania, New York. They buy one hundred percent of their gas from Columbia Transmission. Although I am sure that they do not, or they would be curtailing more. Or they may buy only one percent of their gas from Columbia Transmission. They may have other sources of supply. They may have some of their own gas wells. This is a very strong determining factor in the rate of curtailment. Also, the relationship of industrial customers to residential customers has a bearing on the rate of curtailment. Not so much the number as to the volumes supplied to these two groups.

H: You mentioned the same company is the supplying company for Ohio. Then

would we expect to find the same sort of curtailments in Ohio?

W Yes They had been curtailed up until this year, I think, almost the same percentage as we were Now they went into an in-use plan which is a very simple in-use plan They have three categories Basically, they are category three, in which gas which consumed by an industrial customer which could be substituted for. Category two is non-substitutable Category one is your residential, schools, institutions, so forth.

I had, last year, a very lengthy letter to the Public Service Commission expressing my opinion that their specific in-use plan would not apply to the state of West Virginia The number one reason I give is that category five, which is boilers which consume I think over 300,000 cubic feet of gas a day We will scratch that number, but it is an enormous amount of boilers In the whole state of West Virginia, there is only one that belongs in that category So how much does that really help? In category four there cannot be more than two to three customers in the state, served by Columbia, that is This is boilers of the next smaller size which are still enormous So it is really not much point in having those two categories The in-use plan, as I see it, really is not that Many people think that natural gas is all used as a fuel, in other words, for firing This is not so As I mentioned earlier, the Dupont plant, at one time, used most of their gas as a feed-stock item, meaning that they took the constituents that make up natural gas and broke it down and used it for making their product or in the process there of Quaker State Refinery in Congo was the same situation They break the gas down and take the hydrogen out This is used further along in their process So yet that in-use gas or feed-stock gas as we call it, which is a gas used for its chemical property rather than as a fuel I do not think it is a readily substitutable item Yet this gas could very well be classified in the same category as processed gas So here again, I think the plan had a fault

It also has a fault in that it discriminates against the larger customers For example, in one of the lower categories, which would be one of the first ones curtailed, are your large commercial customers. But if you are a small commercial customer, you are in the next higher category So who is to say that my warehouse is less important than your flower shop? Here again, it is a discriminatory thing. Really, we went from a situation where we had eighty-some customers during the brunt of the curtailment, now we are down to forty-some customers bearing the brunt of the curtailment, due to this reclassification.

H. Instead of broadening the curtailment, they stacked it heavier on fewer consumers

W Right. Instead of broadening the base, they narrowed it.

H Narrowed it It seems as though, like you said, discrimination seems to be pretty

evident

W Really, the big thing is that they do not want to get into the situation where they would have to curtail residential customers or schools or hospitals or whatever, even though many of these homes and schools and so forth got, probably, firing boilers, heating hot water or steaming.

H Or you could use a substituted fuel, oil, in the boiler or something like that?

W Right

H Do you happen to have any information on what percentage of the gas is used commercially as opposed to what you would call in your category one, your residential institutional gas?

W In West Virginia it is just about 50/50.

H About half.

W Right

H So they are putting all of the curtailment on the industrial side of it and actually no curtailment on your residential or institutional use

W Right

H When it is 50/50 So a man has a warm home but no job?

W. No job that will earn money to pay for the gas.

H To heat his warm home?

W Right Good point I forget the number now I was going to say how many customers there were in the state, but I forgot But there are really about 44 large industrial customers bearing the brunt, bearing the entire load of the curtailment I am sure that if you want to philosophize a little bit, the gas shortage problem probably, the fault, lies at the feet of both parties When natural gas became big in the United States really, anybody could get it that wanted it All they had to do was say that they wanted gas, and they would come up and put a pipe in for you. At the same time, the consumer was probably very wasteful There is probably no question of that But Columbia has maintained that through their advertising change where over the last three years, they had been urging efficient use and tightening things up and cutting your

thermostat back and so forth. The residential consumer has on his own, strictly by urging and not by use of any mandatory curtailment rate, came up with a six to eight percent savings the first winter.

H: That is very interesting. My particular interest in coming to you was to find out different places where the government gets involved in your operation. This seems to be a big problem in all industry. I am sure energy is probably the one that takes up most of your time, and thinking and planning and so forth. But are there other areas where government regulation really affects the clay industry? What about things like mine safety or other things along the line of safety where the government gets involved?

W: Well, at my particular installation, in the fact that we also have our own underground clay mine, we come under the West Virginia Department of Mines Inspectors. We come under the Federal Bureau of Mines Inspections which is now known as MESA, which is Mine Enforcement and Safety Administration, and we also come under OSHA, which is a federal agency that stands for Occupational Safety and Health Act. So we have a good number of people coming in and out of here periodically and on a regular basis to insure that we maintain safety in the mine as well as in the plant. The MESA people have jurisdiction over the remainder. The state department of mines, of course, they make their regular inspections, and they are basically in charge of all the educational training for the miners. MESA insures that we stay up-to-date on this training, and they do provide instructors of training programs.

H: I have interviewed two men, one of them who is your foreman, Mr. Yorke, and then this Mr. Staley that I had talked to you about. Both of them lost their fathers when they were very young fellows. When Mr. Staley and Mr. Yorke were very young boys, they lost their fathers in mine accidents. Both of the fathers were killed with dynamite charges that went off prematurely. Maybe it is just a coincidence that in my six or seven interviews, I have run into two men that lost their dads in the mines and ran into a third man who was hurt in a cart accident, a derailment in the mine. Now this was a long while ago. Let us see, Mr. Staley lost his dad when he was nine years old, and he is now 79 years old. So that would have been 70 years ago. I do not know what Mr. Yorke did tell me how old he was, but it would have had to have been 40 or 50 years ago that he lost his dad in the mine. How does mine safety compare now with mine safety now?

W: Well, I am going to give you an answer based mostly on assumption and a little bit of knowledge because I am not much of a miner. I had not underground mining experience until I came here and took over this operation. In the eight years I have been here, we have had no fatalities and only one serious accident and that just happened this spring, where a boy broke his leg. They way he

broke his leg was not anything particular to a mine accident. He was going something stupid when it happened. When I heard about how it happened, I just came in here and shut the door because I did not even want to talk to the mine foreman. We have had several minor accidents, all of which, I will say all without any reservations, could have happened just as easily on the outside as it did in the underground. They were not particular to a mine.

From the standpoint of explosives, I do not imagine that fifty or seventy years ago they had the different types of explosives that we have today. We are required by law to use what is known as a permissive high explosive underground. It is a different mixture. It can only be detonated with an electrical cap. Several years ago we did some repair work on our powder magazine. There was some old powder inside that had gotten wet. We could not even burn it. We eventually just unwrapped the sticks and buried it. There is always the danger of a fall underground. But we operate under there, underground, with a very specific and approved pattern of roof bolting as provided by the state department of mines, which we must adhere to. At the intersections where the rooms intersect, where you have a very wide span in addition to the roof bolts, you must also build, we will call them pillars, in each corner for additional support.

We have had nobody injured in the eight years I have been here from a fall. Most of the injuries have been one fellow turned his ankle. He stepped on a lump of clay. Another fellow hit himself in the foot with the sledge hammer. Here again, I can recall no accident which is particular to an underground mine.

H Do you know when this stringent mine safety regulation and observation and the educational programs and so forth, when these started to come into effect?

W Not exactly. I do know that coal mines now in the state of West Virginia cannot place a green man underground until he has had eighty hours of training. Here again, we are operating a clay mine which in no way has the potential hazards and dangers of the coal mine. In fact, we have eliminated all of our electrical equipment underground with the exception of lighting and the motors which drive the conveyer belts. All of our equipment is diesel powered. Of course, diesels are naturally lower in carbon monoxide emission. These are specially designed, which are even a little more cleaner, plus the exhaust system is scrubbed, so to say. Of course, these engines must be tested and approved by the federal bureau also. So we have eliminated a lot of the electrical hazards as would be present, say, in the coal mine. We are operating at a height of eight feet, which is much different from a coal mine. We do not have the ever present methane gas in a clay mine.

H It just is not there? There is nothing to produce the methane?

W The methane comes from the coal

H Oh, okay

W We do not have a water problem underground

H I understand that some of the mines on the Ohio side of the river now do have a water problem because of the slope of the clay vein. But you are on the fortunate side, right? You get some natural drainage?

W I think that is right. And also, we are going in it at a slope. The only water we do get is water from above. There are mined-out areas above us. Coal mines mined out on above us. We get a little water here and there at various places from that. Nothing that creates a problem.

H Approximately how far below the surface are your rooms right now?

W The rooms we are operating in, coming straight down, is probably three hundred feet. The distance from the opening horizontally in, we are probably approaching a half mile in the direction we are at now. At one time, we were over a mile in one direction, and we pulled back and went another way. But we have an excellent safety record, except when you compare it like the bureau does with accidents per thousand man hours worked. Ours looks terrible because we only have eight men employed there, so one accident looks terrible.

H Talking to some of the old timers with regard to the vein, I understand that there are three veins of clay in this area. Which vein are you working at your mine out there?

W It goes by one name, the lower cationic.

H That would be, I guess, the same as they call the middle vein or something?

W I am not too sure.

H Are you behind what they call the rock roll, then? They said that there is a granite roll that stopped some of the early miners. They went back to it, and then they had to cut through it and get behind it.

W It is curious that you should mention this, what you refer to, granite roll.

H Yes, granite roll.

W Because over the past six to eight, maybe ten, months, we have experienced something similar to that out there. We finally got a pattern going. We marked it on our mine map. We are now headed in a different direction. Where ordinarily in most every area in our mine the roof will stay almost perfectly level. When we shoot the clay and load it out and you look back through the room, of course, we are shooting right under a coal vein which we bolt then right to the roof and leave it up there. It looks just like looking down a long hallway. But over this past eight or so months, we have experienced a problem going toward the northeast, that we hit this roll in the roof. In some areas, in fact, it actually rolls you right down to the floor, and we had to stop. In other instances, we went through it or under it, which cost a lot of time, a lot of money, and a lot of new special roof bolts. So we decided to leave it and proceed north again, parallel to the original made entry. Also along with this roll, we experienced a change in the quality of our material we were taking out.

H. Improvement or lesser quality?

W No, less. As Mr. Yorke likes to refer to it, "Less and less clay, and more and more stone."

H. Mr. Stalye was giving me the cry about the too much stone bit this afternoon. He dwelt on that at great length. The difficulty of making brick at the union works when he was a boy because they were in an area of too much stone.

W. They were.

H Is there any danger, now this is sort of a ridiculous question, but I am asking you to stay within reality, is there any danger of exhausting the clay supply that is in the hills here at the rate that it is being used now for ladle brick?

W I would guess, I will make an educated guess, and say not in my lifetime. For example, I think right now globe must be underground six miles. Of course, we are limited because the property we have access to, but if we can recover seventy to eighty percent of what we think we have underground there, it will be a problem I will never have to worry about in my lifetime. We do test ahead. We go up on top and sink a core drill down. But it looks like now that maybe we have hit the same granite roll that Mr. Cuppy was talking about. But during this same time we were experiencing a very similar problem. A certain amount of stone which is located in the lower portion of your clay bed is desirable and even a little more than you would ordinarily want would give you no problems. But there were times when we were just having trouble putting this stuff together. It was like trying to press sand. We are slowly getting out of that area.

- H That gives you an undesirable finished product, then?
- W Well, not as much as you might think. Most of the properties that you desire, you do not quite reach the specks you want, but a couple of the other properties improve for some reason. I am not sure why. It causes problems not only in the making but also causes problems in firing.
- H Now for the type of brick that you are producing, do you have to import clays to add in with the local clays?
- W No. Ladle brick in case none of your previous interviewees have told you, is a type of fire brick which in turn are a type of refractory material. Ladle bricks are very unique in that they possess the quality of secondary expansion. Have you been told this previously?
- H Yes the idea that when they heat up to a certain temperature, they are seamless inside the ladle.
- W That is what you try to attain, yes, right. This quality comes from the raw material, certain vein of clay. As fire clays go, the clay used in the manufacture of the bloating type ladle brick is very soft. It does not look soft when you are shooting it and mining it and crushing it, but compared to other clays which are used in refractory products, it is quite soft. In fact, some fire clays are referred to as flint clay because if you were to pick up a handful of pebble sized and run them around in your hands, you would be cut because they are that hard. Now these clays have to be blended because they are so hard that they almost have no plasticity, and they cannot be formed very well. But, no, we do not add anything. Some of our plants are adding what we refer to as grog. This is second quality brick from the kilns that are no good for shipping and that they grind and add back in to the clay.
- H that is just like putting scrap iron into the product when they are making new steel. Is that the idea?
- W No, I think that would be more like putting bad green brick from the shop back into the clay bin before they are fired. When you are adding grog, you are adding a material that has already been fired to an unfired mass. This will do several things for you. The main thing is that it will give you green strength. If you use certain type of clays which are very plastic, they have very little green strength. As a result, when they are placed in the kiln and they are stacked, they mark rather easily. It will also help your shrinkage. When you make a brick on a press, you want it to be a certain size. Well, you have to make it so much larger because it shrinks during firing. If you have too much shrinkage, then the

additional grog will help control that because you have a certain percentage of material in there that has already been shrunk. We do not do that here. We never had reason to.

H: It would seem as though each plant would be unique because of the raw material that it was using and the market that it was supplying. Is that the idea?

W: I would say from the raw material available, we also buy the same market.

H: Oh, you all go into the same market?

W: Well, our customers are all steel mills, hence, their brick are subject to the same conditions. All our three plants in Pennsylvania all get their clay from the same source, not an underground mine. It is a strip mine operation. You are right, though, that my clay being somewhat different from their clay. I have different problems. My firing schedule is longer than theirs. Although we are working all the time to shorten this, or to change it for the better. I get more and faster wear on certain items such as the screens and low boxes where we make the brick and the dyes and the grinder parts and the shutes because my clay seems to be a little more abrasive. Yes, that would be unique in that perspective.

H: Okay, we have talked about the fuel crunch, and we have talked about the mine problems. Are there any other areas that you run into governmental controls as far as the clay industry is concerned?

W: Probably one of the biggest ones are your environmental protection people. They are constantly after people not to pollute the air, and there are probably no bigger polluters or have been no greater polluters than brick plants. Originally, it was a combination of the fuel which was the coal plus the impurities burning from the clay. We have eliminated the coal problem. Natural gas causes no visible emissions in itself, but the brick, when they pass through a certain stage in the firing process, brickyards refer to it as the carbon stage, it produces a blue-grey stack emission which does not pass West Virginia emission standards.

H: What is in there that might be corrosive or harmful or objectionable?

W: The main thing is that it is objectionable to the West Virginia Air Pollution Control Commission because it is too dark in color. Rather than too dark, we can say it is not opaque enough. They have a test that they call the opacity test. They have a little chart that is round and is drawn in pie-shaped segments. It goes from a low degree which is white, to a dark degree which is black. We are not allowed to produce any emissions which are darker than wedge number three or maybe number two. I forget now. Ours are darker than that. So it is strictly a

visual opacity test.

H: Is this particle matter in the emission?

W: Right

H: Is it corrosive?

W: It is corrosive to metal

H: Did you have a nitrogenous emission?

W: Well, it is acidic for one thing. It has got some sulfuric acid in it. It has some fluorides, some hydrogen sulfide. We are not in a bad position as related to sulfur dioxide. We have run stack tests on our own. In addition to the opacity test, we do not meet the standards as far as quantity in emissions produced either. In other words, we are producing too many grams per meter. We are producing too fast at a certain rate. It is not objectionable in that I have never personally had anybody object to me about it. The Air Pollution Control Commission hearings I have attended either as a spectator or as a participant, I have never heard anybody get up and say that it was offensive. But it does not meet their standards.

H: In other words, they have not put any indictment against the company for failing to meet the standards?

W: Not an indictment, but I am working on a deadline right now

H: Oh, okay

W: I am not sure what the deadline is. I went down. I was there a year ago August and asked for a three-year extension which would give me to August of 1978. I have yet to receive a response

H: Would your tunnel kiln help this situation?

W: Only in that it would make it easier to control. There in the tunnel kiln, you would only have to control one stack which would be emitting this blue plume of smoke 100 percent of the time because you would always have brick passing through this certain temperature

H: In this stage, yes

W. Where with a periodic kiln, it is coming out all of the stacks some of the time but not all of the stacks all of the time, which makes it much more difficult to control. We as yet do not know of a way to control this. Number one, you have many problems with this particular one that comes from our stacks, and the main being is that it is corrosive to metal. It is a very, very small particle size which makes it exceptionally hard to gather and collect the granules. Third item is that it is rather hot. It has to be cooled somewhat before it can be removed. Probably, I am guessing the reason we have not been harassed even more is that globe and CE has spent I do not know how many thousands of dollars experimenting. They think that they are on the right track now. I would probably feel that once they get theirs working, then the Air Pollution Control Commission will come into us and say that this is. However, due to the cyclic nature of periodic kilns, the heating and cooling and so forth, we are not sure that there is anything technologically available today that would do it. I am sure there is something, but probably no one could afford it. So this is probably not going to end.

They are also concerned about dust. I have to keep my load either oiled or watered. At the mine, our crusher is right outside the mine right outside the entrance. We have to be certain that it does not produce too much dust during the crushing operation. But the main concern, of course, is the stacks. Of course, water pollution is another problem. We do not have any problem there, that I am aware of at this time.

H. Do you use a lot of water in the process or not so much?

W. Not a great amount, no. The water is the only thing we add to the clay once it comes from the mine. We get it from the mine, and it is already crushed. We grind it, and the water is added in the grinder. Of course, this helps temper the clay, and it also controls the dust. Then it goes over screens, and that is the only processing we do.

H. Those are three very important areas that are foremost in the thinking of people if they are involved in industry at all, energy, safety, and air pollution. Is there any place else that regulation of state or federal government gets involved in the clay industry?

W. Well, I do not suppose the clay industry is any orphan when it comes to various forms of local, state and federal taxation. I have yet, personally, to become involved with the BEOC or any branch there of. I am not sure why. Maybe they do not associate Crescent Brick with a parent corporation, and maybe they do not figure that we are too large. But I have never been approached by anybody from the organization. I have always made up my mind that if they would come in and say that I would have to hire a black or two or someone with a Mexican surname or a woman, I would say, "Show me where he is and I will put him on."

- H Our community here being unique perhaps that we do not have those ethnic groups.
- W We have women
- H Well, yes, we have women. That ethnic group is here, yes Everybody I have talked to though, and I have pushed this question a little bit, and I find for some reason or another that the blacks just do not cater to the clay industry
- W You are right
- H I think Mr Yorko was one of the most outspoken He said that he quoted some of their conversations that this was the hardest work that they have ever done
- W That conversation was directed to me I remember it very exactly He worked one day and a half He came to see me He stopped and had his lunch at 11:30 and at 12 00 he walked over and told me that he was leaving He said that he had never worked this hard before. In our four brick plants we have no blacks working. We have no women working outside of the office Probably it might be something due to the location. If we were located in the city, we could have some of these ethnic groups working Personally, I do not care one way or the other If I got a guy who is a good worker, that suits me
- H One thing that has interested me, and I have asked the question of every person that I have interviewed, and I have gotten an answer from everybody, but I have not really gotten an answer that really satisfied me Mr Cuppy is probably the oldest man that I interviewed, and he recited seventeen of the clay works that stretched from where Manford's garage is, up through to where the dam is He said in one time in his life that there were the seventeen of them stretched right up along here Now, your operation is the only operation that is in that area.
- W You are talking about the strip beyond the West Virginia side?
- H Yes What happened to them and why? I have gotten answers like concrete took away the paving brick and the plastic took away the soil pipe and so forth But many industries have been able to accommodate themselves to competition Is the clay industry not capable to that sort of adjustment?
- W Well, you mentioned part of the answer and that is some of the clay products that were manufactured here at one time were not refractory clay products, they were building product things like paving brick, building brick, and pipe I am sure that you are aware of the many varied products that have come into the building products, too I would say that has to be a very valid reason There are very few

sewer pipe plants existing anywhere as compared to twenty years ago. I grew up in a town in Pennsylvania that was a clay industry-oriented town. There was a tile pipe plant. There is the plant that our company owns there. There was an H K Porter plant. There was a Patterson brickyard. Within a few miles in either direction, there were many more of the same. Six miles away is a large North American Refractory plant. North American Refractory is probably the second biggest refractory company. There was a large installation there of Harverson Walker Refractory. They are the number one producer in the world. They have five plants right in this one area. Part of their demise came about in that some of the product lines they had even in refractory, well they were strictly refractory, were being replaced by other products made not so much from typical fire clays, but other materials which were much better. So the demand just dropped.

H They could not meet the competition. There was so little comparison between the products. For example, US Steel built a new plant at Fairless, Pennsylvania. It opened up in the early 1950's. I do not know if you are familiar with that or not. Right outside of the gate, almost. General Refractories built a brick plant where they made silica brick. This plant was probably one of the last steel mills made with open hearth furnaces. Silica brick were a very predominant brick in open hearths. They were gradually but very emphatically replaced with what is known as a basic brick. This is a brick made from paraclays, which is a magnesium compound and a little bit of clay for bonding. The specifics I am really not aware of. The life on a basic brick was so much greater than a silica brick that there was just no competition. They could have priced themselves out of the market, and they still could not have competed. Hence, that plant is closed, as are many silica brick plants, because there was just a completely new product.

I am not aware of what all the plants produce in this area, but I am sure it is obvious of what happened to paving brick. Sewer pipe, I think it is legitimate to say that you cement, plastic, cast iron, and corrugated steel, without question, replaced that. You must consider that when you are firing a kiln full of pipe, you get a lot less tonnage in there than you do with a kiln in a brick because your ware is hollow. If you get one huge thirty-six inch pipe that is damaged, you have got one heck of a loss involved. Where if you damage one brick, you do not worry too much about it.

Probably, maybe the labor situation contributed to it. The steel mills, not only the Weirton Mill but the one at Mingo, the old Steubenville plant at Pittsburgh, Crucible Steel, J & L Allequippa, who all, I am sure, paid then, as they do now, higher wages than the clay plants. This may have been a factor.

It may have been a factor of the subsequent generations of the original employees that did not wish to work in a brick plant. Many people view that working in a brick plant is demeaning, less than something else. Probably one of the big factors, especially in the building brick industry, is automation. Face brick plants today produce brick in unimaginable quantities. I mean they cannot at

individual plants. The smaller plants would, in no way, compete unless they had the capital to install similar equipment. It was probably a combination socioeconomic thing. But I am sure some of those reasons are valid. Probably a combination of several of them. It could be a combination of poor management and absentee management. There are many companies, one of our competitors assure that they manage strictly by looking at the tally book, what is on the black side and the red side. They do not look to see what plant improvements they had made, if any, or so forth. Hence, they are almost out of the refractory business, either through plant closings or sales or whatever. I am sure it is a combination of many of those things.

I have to admit that living in this valley, which is a river valley with a high population content and nasty weather, it is not the greatest place to live. In fact, it is probably the worst place I have ever lived in, environmental-wise. It probably runs a close last to the worst place I ever lived socially. When I say socially, I am not speaking of what people do on their free time, necessarily parties and so forth. It is just a different social climate that I was ever accustomed to here. So many of the people just left.

- H Some of the industries have what they call their brain trusts or their product for the marketing and research division or something like that. Is there anything like that in the clay industry where they are looking for new applications for this product for the use of clay in new ways?
- W The finished product itself here being ladle brick has very limited applications due to the fact that it is not a volume stable brick. As we discussed earlier, it does expand. So there are many areas where that is definitely undesirable. In other words, if you were building something in a high heat area, and you want it to stay, you do not want something that is going to blow and break itself out. The other refractory products of which there are many, many grades of fire brick, basic brick, silica brick, each one probably has a very limited range of applicability. Volume stable brick are not desired in lades. From the limited standpoint of clay brick, I do not think there is too much that can be expanded on in that which I just said, that each specific brick has its own physical and chemical properties which make it suitable for only certain applications. You have acid resistant brick, you have heat resistant brick at various degrees. You have super duty fire brick that go well beyond 3,000 degree limitations. You have brick that are subjected to hot gases and particles, and, of course, at the other extreme you would have the ladle brick and the brick used to line the vessels which are subject to the molten metal itself. One would probably not be substitutable in the other's application.
- H So then there is a pretty stable and limited application of each of these products that finding new applications to them is just not as easy as it is to take something

like steel and find new ways to make different steel products to put it on the market

W Well, I think there are probably more different kinds of steel than there are different kinds of brick, so they have adapted too. I think with the coming of age of the basic oxygen steel-making process, which did not really get started in this country until sometime in the 1950's, I believe. This resulted in two things that would affect both furnace life and ladle life. When I say furnace life and ladle life, I am referring to the refractory linings they are in. Number one, basic open hearth furnaces have much hearth. Number two, there is more slag present. It is the slag that destroys the refractory liner, not the steel. Have you ever been in the open hearth down here?

H Yes

W And you see all the tapper furnace? Here at Weirton, they fill two ladles. If you notice when they run over, the run over runs into what they call thimbles. That is the slag running out of the ladle. In BLP shop, of course, so much slag is required in a ladle. This helps insulate the steel. It keeps it from chilling too fast. But the vessel has got to be emptied. They try to ascertain when the steel has stopped and the slag is coming. They put so much in and they come back up and they dump the slag out the other side. So then you have more corrosive slags at the BLP shop. So this is required in the upgrading of the product, in many cases a new product. Ladle brick industry has expanded from a standard loading type ladle brick which all the ladle brick people still manufacture into what we call a high alumina ladle brick. Alumina being the common term for boxite, well, semi-processed boxite I guess it is. It is very high refractoriness. We make one that we refer to as a 50 percent alumina brick, and we make a few that we refer to as a 70 percent alumina brick. In other words, there is so much alumina added and so much regular other clay or other clays. You get a brick with a much high fusion point and less and less secondary expansion. So you are giving up one for the other. But as are various applications for ladle brick, there just are not too many, even though ladle brick are probably the least expensive of the fire clay bricks. On the scale from one to ten, ladle brick would probably be number one cost-wise, but here again, their applications are limited.

H Well, that pretty well exhausts the different things that I had thought about unless you can think of any other items that might be of interest with regard to the clay industry? Mr. Yorke pretty well took me through the plant orally, I mean to describe how the clay was handled. Mr. Staley backed up 50 years and did the same thing. I really appreciate your contribution because it has been material that no one else has even suggested as being problems of the clay industry being the areas where the industry is confronted with limitations or confronted

with possibilities or government control. This aspect has not been probably was not known by many of the men that work out in the yard themselves, and some of the other men I interviewed from management either did not think of it or did not choose to discuss it with me

W Well, at this particular plant, our company has advantages of being a four plant operation, two of the obvious are shipping and the second one is if one plant is shut down for one reason or another, that does not put you out of business. But the disadvantages are probably just as great in that sometimes you forget you are part of a large company and you think of yourself as one small one. So as a result, when we get into problems like this natural gas situation, I have to get more involved than, say, a company like globe, somebody in my similar position because he may have one or two or three other persons who maybe, this is their ball of wax right here. This is there "bally wick". I know this for a fact because I have talked to plant managers for general managers of other plants either on the phone or at meetings or at hearings, and I am amazed at how little they know about the gas situation not necessarily brick plants but other people as well. I had to out of necessity get involved. I think between January and February and March of 1975, I must have spent fifteen days in Charleston. That does not count the hours of preparation that I had before hand. The satisfaction that I got out of it is that when I did attend the hearings and listened to the cross examinations of the witnesses both Columbia's witnesses and the protester's witnesses why I was never out of touch with the situation. I knew where they were and what they were talking about. So it was kind of a matter of necessity here. The president of our company is a very conservative person. He just, more or less, expects that you are going to do it.

H Does he give you the free hand to go ahead and do it then?

W Pretty much

H That is fine because he might expect you to do it, but then not give you the liberty to go ahead. Oh, he is great and working for this gentleman, it would be impossible for anybody to get a big head

End of Interview