

PAUL BRAYTON

Mussel Farmer

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Student Interviewer: Will Buckingham

School: Ellsworth High School

School Location: Ellsworth, Maine

Teacher or Parent

Interviewer/Chaperone: Mr. Korver

Title: Science Teacher

Transcriber: Joyce Whitmore

WB: What does a normal day consist of for you?

PB: Well, It depends on what occupation I am involved in. I have always worked for myself. So, I don't have a specific job that I go to at a specific time on a specific day. I have been involved as a commercial fisherman where you work twenty-four, thirty six, forty-eight hours in a row whenever you are out fishing. I have fished off shore for almost ten years. We made seven-day trips. And, so you work all the time. When I started to have a family I shifted my fishing from off shore to inshore. I started to catch wild mussels and that involved fishing at high tide. So, then your day was punctuated by when it was high tide and when you had excess to mussel beds and then you would drag them up and load trucks, etc. That was also irregular. I got involved in mussel farming. Mussel farming is much more regular; it is much more like a farm except that you harvest when your customers need mussels. Usually your customers need a fresh product on Monday morning. That pushed us into a Sunday harvest day. That is pretty normal for fisheries producers. A lot gets sold on Monday and Tuesday. Obviously selling stuff on Thursday or Friday is a much more limited time frame. The restaurants are going to be open Friday night, Saturday, and Saturday night and then a lot are closed on Sunday. It is not such a big day. Anyhow, the distribution network is closed.

I sell my products to a distributor, somebody like Maine Shellfish. They buy five

hundred to a thousand pounds. They take them around to all the different restaurants. They have two thousand accounts over there. I don't want to have two thousand accounts; I want one account that sells to two thousand restaurants. I just want to get one check from this guy who I know and I have a personal relationship with. That's the way I like it. That's the way a producer differentiates himself from a supplier.

This is a totally different business supplying restaurants, supplying stores, supplying food service than producing. I produce; they don't produce. They buy from producers. So there is a different function for everybody in that chain.

So my regular day. At the mussel farm we usually start at about five thirty or six o'clock in the morning. We get out, get organized, we harvest stuff, get it back so we can process it, getting it ready to put on trucks at two or three o'clock in the afternoon. We do, three or four guys, between two to three thousand pounds. We do a lot of it by hand, but we have machinery that processes it but there is still a lot of hand packaging and bagging and weighing and all that stuff. So it takes from six in the morning to two o'clock in the afternoon to do three thousand pounds at the mussel farm.

I also have a boat moving business. I have a trailer truck that moves boats around. So, That is a very seasonal thing too. There are not many boats that are moving around in January, February, and March but now in May and June, you know, the boats are in the wrong place again. They have been out of the water for the winter so they must all go back in the water. So I have moved three boats today and I also have a backhoe and I did four hours of backhoe work and I am now here.

JK: Of all those jobs, which is your favorite.

PB: Oh, I don't think I have a favorite. I like them all. They are all different. I think, you know, spiritually, I think I am involved in mussel farming as much as anything that I do. Because, really, it is a good quality food produced in a completely environmentally sound way. The mussels are filter feeders. Do you know how a mussel works, the biology of the mussel. You had better.

JK: Yeah, You can explain it that would be good.

PB: There is a lot of talk about eating high on the food chain or low on the food chain. Mussels are the lowest food chain eaters that there are. They just eat plankton, and diatoms, and algae that are in the water. They are filter feeders. They suck water in and they push it out through a filter mechanism and all those little goobers that you can't even see without a microscope stay in them and that is their food. So the theory is that the higher you eat on the food chain like if you eat a cow, and the cow is eating grass, and somebody is put fertilizer on that grass and all that stuff. So, there is a lot of complexity in that food by the time you put it into your mouth, especially if it has been grown in Central America and

shipped to a processor in Florida, then frozen for Burger King and trucked up to Ellsworth. You go to buy a hamburger and, man; there is a lot of events involved in that.

If you eat a mussel that comes from my mussel farm, it 's been here since it was in micro Laval stage. We catch our own seed and take it from spawn to harvest in about fourteen months. It has never left the local area. It is never medicated or doctored. We do not feed them. We do not use veterinary services. It's just a natural product that hangs in the water...all we really do is enhance the way it feeds. We do what naturally occurs in a rock or a piling. We put it up in a water column at the right density so it grows the fastest and that is all you have to do. And you grow a great product.

These mussels go all over the country to fancy restaurants, they go to Spargo's in Hollywood, go to places in San Francisco and in Florida. It's unbelievable where they go.

So, I think to be able to produce protein on this planet with no, really, I mean there is always some input...we use outboard motors and we have a machine that runs on a diesel engine that processes the mussels. We use four gallons of diesel fuel a week to produce six thousand pounds of mussels. A can of gas will last us, you know, another week. We don't go anywhere. We just go out to the mussel farm and back in again. So, all in all, it is a very green, very sustainable, very low impact way of producing protein - which is hard. You know, look at chickens, look at pork, and look at beef and other kinds of protein. See what it is like. You know. It's pretty ugly when you get right down to it. You know, there is a lot of preventive medication done to animals. All that gets into the tissue. There is nothing done to mussels. It's great.

The down side of that is working out doors in the dead of the winter when you really would rather be inside where it is warm. It is pretty cold.

WB: So, it is year round then?

PB: We harvest year round. We only had three harvests this winter because of the extreme cold. We were frozen out. It was frozen from the harbor pretty much to Bartlett's Island. We were stuck.

WB: Have you always wanted to be a mussel farmer?

PB: Not always. No, I was really happy being a fisherman when I first started. I started fishing when I got out of the Navy. I was a pilot in the Navy. I thought I was going to law school. While I was waiting to go to law school I started fishing with a friend of mine in New Bedford. I really got interested. Fishing was fun, it was a long time, and it was in the seventies. It was quite different than it is now. Much less regulated. More opportunity to catch fish. We made a lot of money. It was good. All parts of it were fun. At that time I wasn't think at all of mussel farming. My wife Ann and I traveled to New Zealand and visited a mussel farm

there in the late seventies, it was about 1979. And, I was thinking, gee, this is really interesting. Because by that time I was thinking, whoa, how are you going to have a family? You know, being an off shore fisherman are a little bit incompatible. You are gone, if you are a good fisherman, you are at sea two hundred days a year plus maybe two hundred and thirty. That is two hundred and thirty nights you are not reading to your kids and helping cook supper and doing all those things that makes a family fun.

When I started wild musseling that was around 1982 I was very interested in that, however, there was a real glaring problem with consistency of good product. You could not go find really excellent high quality beds of wild mussels. They were here; they were there and spotty. They were mixed up with old ones; they were mixed up with ones that had pearls in them. You put a bag of mussels out and you never really knew if they were good or not. And, as I got more into eating mussels, I got more and more disenchanted with that lack of quality. I thought, oh, wow, the way to solve that is you control these mussels, you grow these mussels yourself. Instead of waiting for nature to make a set of mussels out at Green Island and then everybody go out and drag them up. Let's see if we can do that ourselves. It was just getting started. There were guys starting out in Prince Edward Island in Canada. Of course, there were in New Zealand. It started in Spain. The Europeans, mussels...

PB: Did you ever eat mussels?

WB: Uh..

PB: It is not a big part of our diet here. Do you eat mussels?

JK: Not at all.

PB: Gees, see. So in Europe as you know from studying, I am sure, there is much more intense use of the land over there. Because they don't have the mid west like we do. They don't have places to grow a million acres of corn to feed cows and pigs like we do. Their beef production is much much lower key. They don't eat beef every day. There are a lot of families in America that have some form of beef or pork every day. It's just the routine. Even the junk food junkies, they are eating beef. Even though it is junk, they are eating beef.

For a hundred years in Europe mussels have been a big part of the Mediterranean diet. For the Italians and Spanish and French and Belgium's it was a big thing. The first guy that got into suspended culture...the way I grow my mussels. We have horizontal ropes and from those ropes we put vertical ropes down into the water column. Both are long ropes and in rafts. Some of the raft lines are forty feet long. And the long line system, the lines are much shorter because they are in shallower water. They are about ten feet long.

Back in the early 1900s there was a guy over in Spain who was out walking up and down the shore gathering mussels. There had been a shipwreck and of

course the rigging had gone down, the mast was over and there were ropes lying in the water. He noticed all the ropes dipped in the water had mussels growing on them. Smart guy. He said, "Wow, These are beautiful mussels. I wonder what happened." He started experimenting. He got a boat and put long poles across it and hung ropes in the water. He had no idea where the mussels came, how it worked and all of that stuff. And, out of that, came this huge industry. In the Galicia Bay, the Galician province of Spain there are hundreds of rafts of mussels. It is an enormous business. They grow millions of pounds of mussels a year. It's a great product and that is how it all got started. You know, the rope, what we call suspended culture, a rope culture. It started from that guy. He looked at a shipwreck and said, Man, there must be something....

WB: It is just attached right to the ropes?

PB: Yeah, the same thing. When I put bare ropes out in the salt...I mean, by now, it is all a known commodity, right. You can take a binocular microscope and look inside and see the larvae floating around.

Do you know how to recognize mussel larvae?

Do you know how the larva is created?

Well, you got a male component and a female component that is released into the water column and the male and the female -the egg and the sperm.come together and form larvae in the water. So, it is different from the way we are created. Right. But it is the same kind of deal where there are male mussels and female mussels. When they spawn there is a fair amount of chemical that goes off into the water that makes them all spawn together. And this huge...I've seen it from the air. It looks like somebody is pouring milk into the water. This huge plume of white milk comes out of the mussel bed. That's all the spawn in the water. Nature has huge abundance in its reproduction. We don't have a mussel man and a mussel female trying to get together to make two new mussels. We have a female mussel with a million eggs and a male mussel with five million sperm that go into the water. And out of that, these larvae get formed. There are zillions of them. They are everywhere. And when you look into a microscope we take water samples. And you can look and say, Oh, man. There are so many mussels...

So what happens, the larvae gets formed in the water column. It happens about the middle of June. Around the fifteenth of June the water is up to fifty-five degrees. The sun comes out at low tide. The mussels get baked. When the water comes back over them. Oh, they are gone. All the spawn is in the water.

WB: Is it pretty predictable?

PB: Yeah, You watch the water temperature. It depends on the weather. Foggy, cold Junes they spawn later. If you get seven days of nice warm sunny weather, they are ready to spawn. We can tell by handling how ready they are. The

mussels don't do anything except to get ready to spawn. That's their whole life cycle. They eat, they grow, and they get ready to spawn. They do it twice a year, usually.

So the larvae get formed and it floats right upon the surface where a lot of marine larval stage organisms are. The scallops. They all go through a floating stage. Which says a lot about the water quality and how important it is not to have hydrocarbons floating on the surface. Right. When you have an outboard, which has a lot of dirty oil in the exhaust. Hydrocarbons kill the larvae because hydrocarbons cause mutations and so nature's reaction to that in the presence of hydrocarbons is well, I will die, I will kill those larvae so it doesn't become a freak. Nature does not want to create freaks.

You have to have clean water. It is really important to have a good clean ocean. My biggest long-term worry about mussel farming is the human encroachment on the shoreline and the pollution that they bring with them. Failed septic systems, run off, non specific points of pollution, people's yards with all the chemicals in them, dog crap, horse manure, and all that stuff that happens.... is. (Interruption by Will's mother)

So, anyhow, the larvae go up to the surface and float around and they go through four stage changes. They don't stay as a little glob. In the fourth stage they look like a circle with a kind of a flat side and a little tail that sticks out down here that looks just like the letter D. So we call it the D stage larvae.

When you see those, you know that means that larvae are getting ready to settle. These larvae never graduated from high school so they are not very smart but they know that they need to attach to something. So the first thing that comes by they attach to whether it is a bottom of a boat, a piece of seaweed. Anything. Something tells them to hold on. And at that stage they transition from four to five and they immediately develop all the physiological characteristics that we call a mussel. Their guts have developed; they start to develop a shell. Before that they don't look anything like a mussel. You know what they look like. They are weird. But this is the process. It takes about three to four weeks of floating around. It all depends if you have got a lot of wind, a lot of current, a lot of this, and a lot of that. It all effects how they land. Some years they come into a cove and everything is right and they all settle down and everything is mussels. You've seen it. You can go to a place and every space is a mussel. You can go to another cove and there is not a mussel in it. Nobody knows why but what we do know if you put a bare rope down into the water when there is a presence of mussel larvae they will attach to it. We don't know why.

The salt mud is another excellent place for larval concentration. It's got a little bit of an eddy to it. It is warm up in the south end and they can seem to hang there. We don't know why. You know why...the biologist knows why. It's a secret. You have to get a PHD to answer all these questions, I guess.

We know, by trial and error. If you put a bare rope down by the first of July by the twentieth of July you can go out and feel grit on it. By the thirtieth of July if you look through a microscope it will look like little grains of pepper that look just like mussel shells. That is what they are. They are tiny, tiny, tiny mussels. And then they just grow like hell. By the end of September to the middle of October those mussels will be about an inch long. Up in the salt part where it is warm and there is a lot of algae it is a perfect concentration of water temperature and feed to make the mussels grow. Then by the end of October we will thin those mussels out. Obviously nature does not know as much as **I know** about the right density on that rope to make those mussels grow. So there might be five thousand mussels a foot when they settle but the right density is one hundred and twenty five mussels per foot to grow to a mature mussel. You have got to have the right density so they all get enough food. It is no good if they are competing with each other. You know, if we got one cookie on this table and you are bigger than he and I and you take the cookie we are not going to grow as fast as you. You get bigger and you get more cookies and we get scrawnier. So the density is important to you. We want the density to allow the mussels to all grow at the same rate.

So at the end of October or early November, we harvest all that seed. And by now the rope that is the size of your finger is about that big around in mussels. The mussels grow like a doughnut. There is nothing in the middle except mussel mud and the threads that they hold on with. We strip all that off and put all that seed into a machine to separate it and grade it by size. We take the big ones and keep them together, we take the small ones and keep them together, and some of the little tiny stuff we discard. We put them back on and put them on a new growing rope at the ripe density. We leave them there for about eight or ten or twelve months and they are all done and ready to harvest.

WB: How do you put them on the new rope?

PB: We have a machine that comes from Spain from that guy that feeds a hopper full of mussels with a rope and it wraps it up in gauze. So it makes a binding. In three weeks the binding dissolves. It is biodegradable. The goobers in the water eat the gauze. The mussels eat the goobers. The gauze is gone, the mussels are hanging there and that is that. There are other ways of doing it but that is the technique that we have adopted. We used to use plastic stocking and the mussels would grow out through the mesh. You had to get different size socks for different size mussels and different densities and all that stuff. It worked all right but this is much easier, a much faster system.

WB: Where is your mussel farm?

PB: We have two components to the mussel farm One is the salt pond in Blue Hill. It is primarily our larval seed producing area. We are harvesting there now. It is probably the most important seed site in Maine, I think, for mussels. Out in Blue Hill Bay we have five rafts that are adjacent to the salmon farm on Harbor

Island. That is where we do our final grow up, winter harvesting and everything.

JK: How big is a raft?

PB: A raft is forty by forty. At production, it's got about eighty thousand pounds of mussels on it and about forty tons per raft.

WB: So what type of training do you need? Life experience, pretty much?

PB: Yeah, you really have to be stupid to work this hard for that small return of money. No, you have to take things I say with a little grain of salt. You can go to school. There are some training places where you can learn about aquaculture. You can learn about all the biology of it at the University of Maine. They have a research and development facility in Franklin outside of Ellsworth. Up in Canada there are universities up there that have aquaculture programs. So, you can learn. Most people go to learn how to be a farmer. You know, you really need to spend some time on the farm. You go and be an apprentice, you learn. If you really want to do it, you do it.

JK: Do you purposely put your rafts by the salmon farm?

PB: Yes, It is a little bit of a symbiotic relationship. It is a nice deal.

WB: Do you get a lot of money a year for mussel farming?

PB: There is a living in it. We make a living in it for three full time families at the production level. That doesn't include once that mussel is sold, for example, to Maine Shellfish. They make money on it and then they sell it to a restaurant who also makes money on it. So, it goes down the line. It has an economic multiplier. Right. That's the great thing about a raw product or a primary product. I'm not buying something from you for a dollar and then giving that dollar to him and he gives the dollar to you. We are not passing the money around. The money that I get for those mussels is new money to the State of Maine. Most of my customers are from Boston and New York. I have some local like Maine Shellfish. Ultimately a lot of the distributors money comes from out of state. Cutting a tree down, you know, doesn't just all go to firewood. Some goes to paper that is bought by a company in New York. That is bringing money into the State of Maine. That is primary resource production which in one of the most important ways of funding a rural state that there is. You can't guarantee that tourism is going to do it for everybody. It does for a lot of people, but it doesn't do it for everybody.

Yeah, we make a living. And we price it accordingly. If you get to a point that you are producing mussels and cannot make a living, then you have to raise the price. If you raise the price and you lose your customers, then you have to think that perhaps you are doing something wrong. It is always in flux, it is always revalued. It always depends on what your competition does. Our competition is the mussel producers in Canada. You have to watch what they are doing. And

you have to watch what the quality is. It is not just a price game. It's all about how good your mussels are and what the quality is

WB: Do you have any family members that are also involved in mussel farming?

PB: They are too smart. They don't want to work that hard. My oldest child is just graduating from college. I don't think we are going to have any legacy in mussel farming. Actually, I don't know.

WB: Did anybody come before you?

PB: No, my father was a banker.

JK: How many hours do you put in a day?

PB: Some days none; some days ten. A mussel farm probably takes thirty hours a week. Something like that.

JK: Hard work, though.

PB: Can be, yeah. Can be. That's part of our on going deal is to try to make it easier all the time. You are working towards efficiency in your machinery, the ergonomics of what you do physically. You can't lift up three thousand pounds of mussels every day; your back just can't do it. That's why we have hydraulic equipment, That's why you have trucks with power tailgates. That's why you learn to move material like any other industry does without killing yourself. You can't do it. You could do it if we were hunters and gatherers, and we were just going out to get enough for supper, that would be fine. You would only need a little handful. There is a lot of food in a handful of mussels but to do it for a business then you gotta get into machinery. You gotta have help.

WB: Where do you get the machinery you use for mussel farming?

PB: We make most of it. I have built most of the machinery. I have bought a couple of old pieces from Canada. You use your brain. You see what other people are doing. You try and, you know, scope out what people are doing in New Zealand and Spain. You go on trips and visit and look...

WB: Have you taken a lot of trips then?

PB: No, New Zealand was probably the most eye-opening trip that I had. I maintain contact with a couple of people down there. I get journals, there are a lot of trade journals and publications that, you know, you always see other peoples advertising and you see the new gimmick and the new equipment and stuff like that. There again, people are always anxious to sell it to you. There are people in Prince Edward Island that make mussel equipment. They sell it to Chile; they sell it down here. They sell it all over the place. They don't care where they sell it. They just sell it.

When we first started we really didn't have enough money to buy all new equipment. A new set of processing equipment is about one hundred thousand dollars. So, I would say we built ours for maybe twenty.

WB: So what advice do you have for someone who might like to go into mussel farming?

PB: Well, there is a lot to learn. Getting a site. Choosing a location is a very key issue. You have to know the perimeters of what make a site good or not good. A lot of that is social. Do people like you or not like you. You know, the coastal area here is being bought up and taken over by a lot of wealthy retirees who are less interested in having work done in their front yard. The old Mainers a hundred years ago people were all over working up here. They didn't care what you did up here - they needed work. There was nothing to do. Clam digging, cutting pulpwood, catching lobsters, and doing all that stuff was a very vital economy in the State of Maine. Now, that is not quite so there are more people mowing lawns and taking care of landscaping, and weeding, and shingling and painting houses and stuff like that then there are in primary resource production. That's an unfortunate reality that people have to face along the coast. People are talking about it. But unless you can buy a piece of land there is not much you can do about it. It becomes a very economic deal.

WB: How long have you been farming?

PB: I started messing around with it in 1982 or 1983. When I first started wild mussel fishing I was experimenting. My first experiments were out at the Reach down off of Bridges Point. They were a total failure. I got demolished by eider ducks. Every failure is a learning deal. You learn negative data. As you know in biology negative data is as valuable as positive data. If you learn something that doesn't work, well, boy, that is big information.

WB: When did you build your farm?

PB: I started building this farm in 1988.

JK: Did you have to ask permission to put a raft some place?

PB: Yeah. You have to have a lease from the State of Maine. There is a lot of paper work. There is a big application process. You have to have an environmental impact statement to support your contentions that it is not going to have an adverse environmental impact. The wealthy landowners very often get lawyers to fight you and so, you have to decide whether you are going to try to fight it yourself or hire a lawyer to play the game. The game is expensive. When you hire a lawyer it costs about two to three hundred dollars an hour or more. You have to go to meetings at night; it is a very big deal. There is a lot of animosity in the community. The people that are against you and the people who are for you. So, there is a lot of political and social ramifications to how it all works.

WB: Is it rewarding, though?

PB: I think it is great. I am producing something that has good quality that people like and it doesn't have an environmental degradation in the process of doing it. From that aspect, how does it get any better? If you are going to be a food producer, how does it get any better? You know.

WB: Well, I think I am all out of questions.

PB: So what do you think sounds like being more fun - being an interviewer, a journalist, or a mussel farmer?

WB: Mussel farmer. Sounds pretty cool, right now, actually.

JK: I was completely ignorant as to how mussel farming works. Now, I have an idea about it. It is so interesting. It is always neat to see how people will take an inch out of some place. Wow.

PB: That was the exciting part about fishing. When I started in the seventies. Fishing at that time was a real open your eyes and take advantage of the opportunity. The first boat I had was sixty-five feet. You paid a hundred dollars for a fishing license. You could do anything in the ocean -any species, any equipment, that was it - Lobsters, scallops, fish, whatever. It was up to you as a boat owner to figure out what, when, where, and how was the most economically advantageous, whatever, to make it work for you. That was a great system. Little guys with little boats; big guys with big boats. Everybody had to find their own little niche; their own place where the price of this fish was good and we will catch that fish. You know; if the price of fish is down, why bother, leave it alone. So there were all these different layers of balancing that went on with everybody. Everybody would shift. We would go lobstering for part of the year - and sword fishing-and scalloping and fish dragging. And we would do all of this with the same boat. You learned a lot of different skills. You know, you would do something for four or five months and shift to something else and then shift to something else. It was really interesting, fun, challenging. - A lot of stuff to learn. A lot of stuff you don't learn in a classroom. You know, a lot of open your eyes and see what is happening. Take a look, a net would come up. The old fisherman would be looking that net all over. To you, it would just be a pile of garbage in the middle of the boat - seaweed, fish and net, holes, and all that stuff. Some guy who knew what he was doing would see where it was shined up. He would look at a cable and see it was shined up over here and he would say the head rope over here is too tight. They would loosen it up that much and then the next time it would come back he could tell that it was fishing better.

It was unbelievable. It was all empirical knowledge. It was all seat of the pants. You know, how many years this guy had been on a fishing boat; how many thousands of times he had seen that net come up and how he could make it fish on the bottom. He had never seen that fish on the bottom. There were no video

cameras in those days. There was nothing that gave you a clue to what that net looked like on the bottom except what you saw when it came up on the deck. It was unbelievable. I was just completely blown away by what some of those old buzzards knew. It was their life. Their life was on that boat in the ocean and they were brilliant.

The other thing that I developed a huge respect for was how absolutely brilliant some of these guys were that had never been to school. Some of those guys were fourth, fifth, six grade dropouts went fishing and they were genius guys, Mensa quality guys, in their own field and their own thing.

JK: That's what I tell a lot of my students about. I used to work on a dairy farm and the farm hand, if you could have seen him. This guy, he had no teeth, long hair, severely over weight but you just talked to him and he could do anything with a piece of metal and just all this stuff. Just by looking at him you can't tell a single thing about him but once you sat down and get to know him, it is incredible.

PB: I don't have time to tell you all but there are some guys that I have met; they were just landmark people in my life.

JK: Maybe, can you explain one?

PB: Yeah. Well, they were guys...I think back to Ray Columbo. Ray was born north of Boston. He grew up during the depression. He was pretty clever with his hands. He was a kid who could make things. His father was a fisherman but he couldn't put a nail in a board without either splitting the board or bending the nail. He was mechanically inept. In the thirties in the depression, none of those guys up there...they were all Italian fishermen, none of them could afford to have their boats fixed at a boat yard. They fixed them up themselves. So Ray fixed his father's boat. He would put a plank in and planks are a difficult thing. It is a piece of wood that goes around a corner this way, and that way. You have to cut a piece of wood that will fit that hole, you know, and there is quite a lot to it.

Ray's father made him stay out of school and go around and fix other fishermen's boats up for money. So Ray never went past the fourth or fifth grade. He got very interested in fixing up these boats. A lot were old wrecked boats. He would say, gee, this is funny. Here is five of these boats and they all got rotten horn timbers. The horn timber is part of the keel. It goes between the keel and underneath the back of the boat. And he would say, why is it? He would figure out why the deck is rotten. Was it because the deck was built weird? It would let fresh water get down and rot that wood. Was it the way the propeller was turning under there? Was that causing corrosion and making that wood wear away? And he would not only get into how they were building it but why didn't it last. And then he got into the shape of the boat. Why is it that guy's boat with only a one hundred horse 6 cylinder Chevy engine, they were all gas engines in those days, how come that boat goes faster than your boat and you got a V Eight. It

must be the shape of the boat. You got more power, a bigger propeller, but he goes faster. Same size boat. So he got really interested in the shape of the boat. Not only for the speed of the boat but how come your boat is more comfortable to work on than that boat. When you stand on a boat all day, the way a boat rolls is very important as to how your legs are. If a boat is quick like this by the end of the day you are exhausted. You are flexing all the time and you cannot even stand up. If you have a nice boat, a comfortable old boat, you can stand up on it. He got curious about all this stuff.

Ray lived outside of Boston. Do you know where there is a great school of naval architecture in Boston? MIT. So he started going to the Library and started reading all these books about naval architecture and he couldn't understand hardly any of it. He didn't know the words but there were dictionaries and he read, and he read, and he read. By the time he was fifty years old, he was one of the best boat designers that ever came down the road for fishing boats. But he never ever, ever, even has been to a class. But he could set down with a guy right out of MIT and he could discuss all the terms, all the numbers, and all the formulas. He had learned all the stuff. He learned a different way, not in a classroom. He learned it in a book.

It was an amazing thing to me. He was the type of guy who would give you encouragement when you thought you had hit a wall and say, "I cannot do this. How am I going to figure out how to build a net"? Ray would say, "come on, there is nothing to it, let me show you. Let me show you." You would get a bale of twine. You got to have six pieces at the top, six pieces at the bottom, and come sides. And pretty soon you were building a net. And it was just the way his life was. Pretty soon he was building a boat. Pretty soon he was designing a boat.

Somebody who says I can't do that. I didn't go to school for it. That's crazy. I was listening today about Orson Wells. Orson Wells, I think, when he was thirteen years old had completed high school, got accepted to Harvard but decided not to go but went to Ireland. He bought a pony cart and traveled around and worked and different stuff and by the time he was nineteen years old he had written a play that was being performed in England. He never went to college.

The deal with school now. We have almost created a monster in that it has become so expected that you have to have twenty-five years of school before you can even let your brainwork. That's not true. Your brain is working all the time. School is such a piece of cake. You get this stuff spoon fed to you. In some ways, it is a bit of a shame. It doesn't stimulate your own creativity. You don't have to figure things out, you don't have to look around, you don't have to have a job and go to school at the same time because we all have a lot of money. We all come from the land of the good and plenty. So, I don't know. It is just the way our system is. You have to keep your eyes open and constantly look at the system. Look at the system and criticize the system. Look at the system and see not only what is good about it but also what is bad about it. Just think if you were

an Iraqi boy, maybe had never been to school. Think about that.

WB: It would be pretty bad.

PB: I helped some central american refugees get through here on their way to Canada several years ago and we had some eighteen year old kids who had done nothing. All they had done all their life was fight. They were contras from El Salvador. They didn't know anything about schoolwork, reading, writing, vocational skills, nothing. All they knew was fighting. They were tough customers. They were hurting units.

I probably have you all confused now. You don't know whether to mussel farm or write reports.

JK: Are you all set.

WB: Yes, I'm all set. I think we are all done. Thank you.

