ASHRAE Leadership Recall (formerly Leadership Recalled)
Transcription

Interview of: Milton Garland

Date of Interview: September 1992

Interviewed by: Charlie Henck

Charlie Henck

Good morning. Here we are at the regional conference for Region III in Philadelphia. And today we have the pleasure of interviewing Mr. Milton Garland. My name is Charlie Henck with the historical committee. And today we'll start off with Milt giving us a few pointers on your background, how you got started in the refrigeration industry.

Milton Garland

Well when I graduated in 1920 from Wooster Polytechnic Institute jobs were hard to come by. In fact many of my classmates came down into Pennsylvania for jobs. My home was Harrisburg, Pennsylvania and I wished to get employment near home. Just came into Waynesboro with the idea of getting a job and was successful in getting employment with the Frick Company. That was in July of 1920.

C.H.

Before that what was some of your background? Did you live in Massachusetts in your early life?

M.G.

No, my hometown was Harrisburg, Pennsylvania.

C.H.

Oh Harrisburg, that's what you said.

M.G.

I liked athletics. My major item being running. I actually offered a scholarship at Pennsylvania State College which I turned down because I wanted engineering of the first class. As of that particular time the engineering colleges were listed by the Navy and among the five colleges which they claimed to be the best Wooster Tech was one of them.

C.H.

I see, that's why you went there. And then after college you said you were in the service for a while?

M.G.

Well it was during college and World War I is just the same as World War II. Engineers, people, that were eliminated from the draft. But in my junior year just towards the end they said, well sorry we need people and we were put back into the draft. And so I immediately enlisted in the navy.

C.H.

You said that in the 1920 then you started, when you graduated you started working for the Frick Company moving back to your home area. What was it like starting for the Frick Company in 1920?

M.G.

The Frick Company at that time had a policy that any person wanting to be an engineer or a sales person had to spend at least one year in field installation work. And my first year was simply out in the field working with people installing equipment.

C.H.

I see and then after that which progressed to, after your first year?

M.G.

Unfortunately or fortunately I knew construction work very well having had prior experience and I was retained in the field up to the point where I said well I don't want in the field and if I can't get into engineering I may have to look elsewhere. The result was that as of 1923, just three years after joining company I was placed in full charge of all field installation work.

C.H.

But that didn't get you into the engineering did it. That still kept you in the field?

M.G.

Well as of that time manufacturers did not have much of anything in the way of a laboratory. They field was really the laboratory. Of course all jobs were guaranteed as to performance. So at the end of the installation we would usually have a nominal one week performance demonstration and that performance demonstration we took complete data of everything, pressures and temperatures. And in a sense that was the laboratory for companies.

C.H.

So you actually went out and you were really commissioning the systems right there. Making sure they were operating properly which we don't see a lot of today. A lot of times you get a factory piece of equipment that goes in, gets installed and never tested.

M.G.

That's right. Except for the testing work that the manufacturer might have done. Now as of today we do have a laboratory and we do test individual items. But there's no testing of that in connection with the other things that's going to be connecting to in the field.

C.H.

To get an overall system effect of how the system works.

M.G.

That's right.

Okay. Now then you're with the Frick Company, what happened during the Depression with the Frick Company? Did they still stay fairly busy?

M.G.

Well as of the middle and late 20's, that was a boom period. We were putting ice making plants all over this country. I had 40, as many as 40 jobs going on at one time. The Florida boom started at that time. When the Depression hit, I was in New York City and we didn't carry much cash in those days. The company kind of said you who are traveling, you always are privileged to go into our sales office and they will cash a check for you. We had several jobs going on in New York City. We were hearing rumors about this terrible depression which was coming on. I go back to the office because I'm short of cash to get back to Waynesboro. The office is closed. The banks had closed. When the people in the offices

heard about that they immediately went out and got cash wherever they could get a checked cashed. And there I was, stalled in New York City without enough money to get back to Waynesboro.

C.H.

So how did you manage to get back?

M.G.

I went to the Pennsylvania Railroad Station. I told the man behind you counter I said, here is my gold watch and chain. I said, I would like to leave it with you if you could accommodate me with a ticket. And when things get straightened out I'll come back and pick it up. The man was good enough to do so.

C.H.

Oh, that's fantastic. So then after the Depression what is happening with you and the Frick Company?

M.G.

Well could I tell you one other thing about the Depression? These men who were installing these jobs in Florida and Florida had this terrific boom. They had invested money in land. Now they had received that money by over drawing their account with Frick Company in Waynesboro. And now they're in the same situation. They cannot carry on the necessary payments and so what can we do. For the most part Frick Company did not demand immediate payment of the over draws. People who had sold the land said: "well we will wait please hold it". And some of those fellows later on at the time of their retirement really made a lot of money out of that particular investment.

C.H.

Interesting. So then what happened after that with you at the Frick Company?

M.G.

Well as the recovery built, it built rather slowly but you see it was right at that time that the halocarbon refrigerants come along. And so now with the halocarbon refrigerants there's just opened up the field for air conditioning. And Frick Company, as well as York, we immediately just reconfigured our compressors so that our current line of ammonia compressors could handle the halocarbon refrigerant. So really it was the demand for machinery for air conditioning work that helped rebuild the country and the refrigeration field. We, Frick Company, was active in air conditioning work. We air conditioned a war department, the early offices there on Virginia Avenue in Washington, and many of the larger hotels. Now in those hotels that air conditioning really just extended as far as the dining rooms and not into the whole building.

C.H.

Not through the rooms that people were staying in. I see, I see.

M.G.

Now as the economy improved then the building of ice plants and food freezing now coming in a big way. So in the late 30s and before World War II business had picked up. It had really reached a point where Frick Company had to make decision. Are we going to go big way with air conditioning or stay with industrial work and just only do the air conditioning in specialized installations. And that was a decision that was made at that time. York Company decided that they were going to put a major emphasis on air conditioning. Later on they completely dropped out of the industrial field.

C.H.

I see. What happened during the second World War?

M.G.

In the second World War we were 100 percent on defense work. It just so happened that our foundry which was capable of making a very large casting, the old A frame machines, demanded those big castings. So we did a lot of work for others in making big castings. One or two of the important items were lathe beds, 85 feet long to accommodate gun making. And then our compressors, particularly the intermediate sized and around 30-40 horse power, they we're going big into the Navy. All the big battleships, the Missouri and the New Jersey and Iowa, hey had 34 units air conditioning the ammunition holes. In 1940 just prior to the war, I got a pretty good idea that the war was coming on for real because we were asked to make an installation for a gun firing room at Aberdeen proving ground. Now it was a very modest installation in that we were to cool a tank down to minus ten degrees Fahrenheit. All parts were supposed to be at minus ten within an eight hour period. That was accomplished. A gun firing room had a slot in the roof with doors and they could open those doors and we're supposed to be able to raise the barrel of the gun to an elevation that they can shoot out from where it was setting. Ammunition was in the room at the same time and cooled down to the same temperature. I remember well that was the Sherman Tank, the modern tank of the day and quite a few dignitaries from Washington were there at the time of the initial test run. The first stage was passed. They were satisfied that everything was down to temperature and now the order was given to start the engine in the tank. The engine would not start. Cart loads of batteries were pulled in but no amount of battery power would start that engine. That then was abandoned and they said well we'll just go through with a gun firing. Let's open the breech, load the gun. They could not open the breech of that gun. Ok let's elevate the gun. They could not elevate the gun.

C.H.

Everything froze up?

M.G.

Finally in desperation they said well let's get this tank out of here and bring another one in. When they hooked up a tank from the outside the tracks would not turn. In other words at that particular moment lubricants we're not anywhere near the state of the art as there are today. And this was all a fault of the lubricants. Later on we built engine testing. Engine testing now was to be down at minus 75 degrees. Common gasoline at that particular time would freeze at minus 40 degrees. The tremendous improvement, I would say occurred because we had refrigeration available which would enable us to get down to the temperatures that they knew they were going to encounter in the field. I'll never forget one engine testing plant for a Lycoming engine. They were aircraft engine. Now in addition to cooling the room we had to also cool the air that was coming in to operate the engine. My concern as an engineer and connection with the job was frosting of the coils. But frosting of the coils did not present any great problem. We were able to take care of that but the first engine ran just a matter of about five minutes and then stopped because it was plugged with snow. What we discovered was that when we got into air temperatures below minus 35 degrees Fahrenheit frost no longer clung to the pipes surfaces, the evaporative surfaces, but just went out into the atmosphere in snow. Which simply resulted in having to rig up snow traps so that that didn't interfere with the engine operation.

C.H.

That's an interesting problem you solved. Now after the war, what was going on with the Frick Company through the early 50's and into the 60's?

M.G.

Well it was a difficult time. It was difficult in this respect. During the war we had priorities and we could get the oil that we were selling for our machines but then the Korean situation come up. Now the priorities that we had in World War II we're no good at this time. And suddenly the people who were supplying us with lubricants as well as some of our high grade seals said sorry we cannot accept your orders. The reason being that the Army and Navy at the time, the Korean situation, they just slapped priorities and only people who had required priority could get these high grade materials.

C.H.

Okay. Now you've been involved in ASHRAE since what, 1920 or ASRE? When did you join ASRE?

M.G.

I joined ASRE in 1925. And when that Depression hit in the late 20's early 30's, at the time I couldn't get home from New York. My brother had started an ice making plant. I was involved financially. And immediately in that depression the bank foreclosed our mortgage. The question was, why pick on us. Our neighbors here, we know that they're broke and haven't been paying interest in the principal. But we have been. They said yes that's why we're after you. We have to have cash.

C.H.

I see. They knew you had cash so you were paying it so they wanted it.

M.G.

That's right.

C.H.

Though going back to ASRE in 1959, ASRE merged with ASHVE.

M.G.

Yes. I had dropped my ASRE membership for a number of years there because everything I had I had to put in tt salvage that ice plant. Then I rejoined and immediately or sometime during World War II there. Prior to the time of the jointure of the two societies.

C.H.

How do you think the joining of the two societies benefited ASRE?

M.G.

Well it benefited ASRE because ASRE was a relatively small group as compared to ASHVE. And so now we were going to have a much bigger group and presumably going to have the benefits of the joint information. Refrigeration of course a vital item in air conditioning. And air conditioning was a vital item in regards to sales of refrigeration. So it looked to be beneficial. There were some other things that really disrupted the jointure. There was a move on foot to outlaw the use of ammonia and many of the industrial people who were heavily involved in ASRE they were greatly upset over this attempt to outlaw ammonia. They felt like it was as though the jointure since the larger number of people were from that air conditioning field would hurt them in their fight to salvage ammonia. That was the time of the organization of IIAR. It was simply a self defense matter.

C.H.

I see. So a lot of the ASRE people joined IIAR.

M.G.

That's right

C.H.

And they left the new ASHRAE organization.

M.G.

That's right.

C.H.

Now you've been involved in an ASHRAE for a number of years now in technical committees. What are some of your committees you served on?

M.G.

One of the first committees was on Lubrication. I think that was because of the fact that along in the late 20's none of the manufacturers sold oils, that is the machinery manufactures. They simply recommended a so called ice machine oil. An ice machine oil was nothing more than a straight run mineral oil. You cannot have any of the additives that are used in automotive type oil in the refrigeration system because refrigerants will throw them out. The Pennsylvania fields which were the paraffin base oil, they were running out. Louisiana, Texas, and California those fields were opening up but the base of that oil was napthenic. And now the people who were supplying the oils said now we're going to have an improved oil. It will be good just call up Arctic Sea Heavy. We all went along with it just thinking that the oil people knew what they were doing. But unfortunately at that time the refining that was available did not remove the resins from the oil. And now those resins with that oil they and right at that hot area of the piston ring, when a machine was shut down those resins would simply change to a varnish and now we had a machine with the pistons varnished to the cylinders and it could not be turned over.

C.H.

Every time a company would turn off their machine it would just seize up.

M.G.

That's right. It would freeze up. And the warranty expense was so great that York and Frick immediately went in to supplying their own oils. Naturally we had to buy them from refinery people but we were now buying on a specific specification which really what it amount to was we were going back to the original Pennsylvania class of oil, the paraffin base oil.

C.H.

You're also on TC 8.1.

M.G.

Yes. That related to compressors. I over the years when on and off with that at every opportunity possible. And I always had a normal four year tenure and then one year off. That was excellent work. We had many, many seminars. Most of those seminars were really related to telling people what was necessary in the design and operation of a system to give maximum protection to that compressor.

C.H.

I see. Okay. Now in 1967 I believe it was, you were elevated to, well I'm sure in 1967 you were a life member of ASHRAE. You're also a Fellow of ASHRAE. What year did you become a fellow of ASHRAE? Do you remember?

M.G.

I became a fellow before I became a life member.

C.H.

That was probably sometime in the late 50's early 60's

M.G.

I do not recall an exact date.

C.H.

Okay. The very big honor to be a Fellow of the Society. You have also received the Distinguished Service Award. In addition you have now I new refrigeration award named after you. The Milt Garland Refrigeration Award.

M.G.

That's right.

C.H.

Has to be a great honor to…

M.G.

It certainly had been.

C.H.

And I understand that also in Region III, you have made a donation to Region III to start a Milt Garland scholarship fund.

M.G.

Yeah the purpose there was simply this. When I was in college while I had good training relative to thermodynamics, there was nothing that you might say that encouraged me or even intimated that the field of refrigeration, whether it was industrial or air condition, was a good way to go. And I found out that in the high schools and most college there was very little emphasis placed on the area of refrigeration as a good place for employment. People were just given the basic fundamentals of thermodynamics and that was the extent of the training.

C.H.

Now ASHRAE has taken a big step recently to get back and strengthen the R position. We now have R handbooks. How do you feel that that…

M.G.

Well I think it's a wonderful move and it's one that I worked hard to try to get going. We still need to do more to get the industrial people back into ASHRAE.

C.H.

Okay, Milt, tell us how refrigeration has changed since you've been involved in the industry from 1920 to today.

M.G.

Well the industry has grown terrifically. Now when it comes to change there's a cycle. Compression refrigeration cycle has not changed at all. We've had tremendous changes and ideas as to how to correctly handle those refrigerants. When I first started in 1920 naturally being new to the business I read magazines and went to various meetings and here it was red hot discussion about wet or dry compression. Wet compression. Well there was a company by the name of DeLavergne. Had a plant in Jersey City. And they were the chief competition for both Frick and York and Vilter. They said, now we inject oil at each stroke of the piston for the purpose of filling the clearance area. By filling that clearance area there was no re-expansion and therefore we got a much bigger volume of new gas back into the cylinder. And their argument was correct. On the other hand people building the dry compressors said, well okay if you could do that successfully but you don't do it successfully because people over adjusts the oil and that results in severe damage even breakage of the cylinder, blowing out

of the head. So we recommend the dry compression because there's no danger of that damage. Now in the end the dry compression worked out because it was the safest way to go.

C.H.

What are you seeing today with the screw compressor that we see in most air conditioning equipment?

M.G.

Well the screw compressor you see again is a wet compressor. In other words the screw compressor would not be what it is unless, until we went to the large volume of oil. I personally ran tests on the Lysholm screw compressor, the dry compressor. Those tests were back in the 1946. The efficiency was so poor that the company wouldn't have anything to do with it. But later on some European people come up with the idea that well we'll just put an excess amount of lubricating oil in there and fill up those leakage areas. And we accomplished two things. When running dry we ran at very high speeds. Far above 3,600, the maximum with two pole motor. But now with the oil injection we can run at 3,600 and have a highly efficient compressor because we fill up the clearance area and we fill up the leakage areas. We wind up with a lower temperature in the discharge vapors. Of course we did add the problem of oil separation. But that has been successfully corrected to the point where today, screw compressors are sold guaranteed with an oil usage not to exceed 50 parts per million.

C.H.

Now you've been involved with ammonia throughout your career. Tell us something about the ammonia industry.

M.G.

Well ammonia was of course the original refrigerant from an industrial view point. It always will be the best refrigerant for several reasons. One of the main reasons is that it takes less than a half a pound per minute per ton of refrigeration. Whereas all of your halocarbon refrigerants, they take more than two pounds per minute per ton of refrigeration. Now naturally it's going to take less energy to move a half a pound of refrigerant around a system then it was going to take to move two pounds per minute per ton around that system.

C.H.

We hear a lot about the toxicity of ammonia. How do you feel about that?

M.G.

I think ammonia is the safest refrigerant in this respect. It gives a warning. Nobody is going to stay around with an ammonia concentration which is going to be harmful. Your only fear with ammonia is panic. Naturally people are going to try to get away from it. Now this is why I wouldn't want to have ammonia positioned where any escape could affect a lot of people. But for industrial work and when we keep it confined away from where it could get where there was a crowd of people, to me it's the safest refrigerant.

C.H.

I see. What are some of the applications you've seen in use for ammonia in your career?

M.G.

Well ammonia been applied for the cooling of anything that you can imagine

C.H.

You've mentioned about a problem before of the solubility of ammonia. Can you relate that story to me again? On the ice.

M.G.

Well ammonia can be the refrigerant for air conditioning, if we keep the ammonia and ice making remote from the air conditioning area. Making ice with ammonia, then transporting that ice, of course the ice has to be in the fragmentary form, over into the area of air conditioning is perfectly safe because ice will not carry ammonia. We might say well now suppose you got a leak here and this got into this ice prior to its moving. We still will not carry any ammonia with that ice. Now I know that from experience with the old block ice machine plants where ice in the storage was exposed to an ammonia leak and a lot of the surface of the ice had been melted because of that leak. Naturally there was always the claim of who's going to pay for the lost ice. We would accept just the loss in weight. And that was a successful conclusion because ice taken to the laboratory and tested they never could find any ammonia in that ice.

C.H.

How do you feel about the CFC issue today?

M.G.

Well again the CFCs must be eliminated on the basis of what others tell us that makes it harmful. Our substitute of course is the big problem. One thing that has not been mentioned in particular is the extreme difference in density. Ammonia has a density about half that of air. A refrigerant, for example like 22 has a density 1.6 times greater than the density of air. So we have from my viewpoint of safety the two distinct situations. Ammonia will rise.

C.H.

Being lighter than air, yes.

M.G.

Being lighter than air. You're halocarbon refrigerants as well as CO2 will fall. It simply means that if we apply venting with a halocarbon refrigerant our vent outlet should be near the floor level. With ammonia the vent outlet should be near the ceiling. But this is something that's often overlooked because there never has been any particular emphasis on the fact that these density differences do exist.

C.H.

I see. You've been involved in the Society and you see many various presidents throughout your years. How has Society changed over the years from your influence with being involved with presidents and all the technical committees and just in general how you see things go with Society?

M.G.

Well. I have no quarrel in any way with the conduct of the Society. I am apprehensive of certain things are this sort. The work is voluntary. A man serves on the committee for four years and then he's removed to give a place for others. Now that is an excellent idea but the fault often exists in the fact that that new man lacks in experience. He's anxious to serve but he doesn't have experience to bring along to really give something to that technical committee. And I have witnessed the fact that a committee like 8.1 which for many years was providing a seminar or something similar almost yearly to the Society but hasn't given much of anything in the last six or seven years. And that's not because the people there don't want to give it. It's simply the lack of the experience that enables them to put it together.

C.H.

I see. Do you think that the committee can go out and sort of recruit people that have the experience to join the community?

M.G.

Yes, the Society asks for people to volunteer for the work. And many of those people are capable individuals. They are anxious to join but again they haven't passed any kind of look test as to their qualifications to work on that committee.

C.H.

I see. What do you think people that are qualified to work on that committee, why aren't they coming forward to work on the committee?

M.G.

Well I hate to say it but it's because they don't belong.

C.H.

They don't feel like they belong.

M.G.

Yes. There was a day when, out of, I'll say out of 12 engineers at Frick Company, all 12 we're members of ASHRAE. Today with no less than 30 engineers, less than half a dozen belong to ASHRAE.

C.H.

I see. It's a shame that they all aren't members of ASHRAE and get involved.

M.G.

Now to me what I see as the reason is the one that they give. What is there for me in ASHRAE. The ASHRAE journal I have received by myself and others in Frick Company is made available for them to read, which they do. And what they read 99.9 percent relates to air conditioning. Now we have a tremendous change in this whole refrigeration application field. People who put together package units, Train, Carrier, York, that unit is factory design, factory tested and is top notch in every respect. But it works in just a very narrow temperature range. But people who are working in refrigeration in the industrial field they're looking at something entirely different. In the industrial field the manufacture's no longer sell a complete installation. For the most part manufacturers are now component builders. And others in the field buy such components and put them together into a system. So now the whole question is those others who are saying now we ought to have this compressor, we ought to have this kind of evaporator, we ought to have this kind of a recirculation system, do they carry the necessary to really be qualified to do that work. So the industrial field from my observation, they're the field that is demanding training. They're demanding training because they have these plants that are complex. They are big. Some of them are scattered as much as a city block they are so big. They have multiple temperature requirements. Whether or not they should have multiple refrigerant temperature levels is very critical from the viewpoint of energy. But to me I see so much of a lack of experience in people putting them together and therefore I meet up with the plant owners who are still begging what can I do to help reduce my costs.

C.H.

Well one of the things you do for Frick is you do go out and do training courses to train these industrial operators.

M.G.

Yes, we have two schools. One is basically for this service person. Now service people, there's always a distinction there. One class of service man is excellent from a mechanical viewpoint. He can tear a compressor down and make repairs and so forth. But then he's not necessarily acquainted with the thermodynamic properties of a particular refrigerant that's being used in order to analyze performance in the system. Not performance of individual items like expansion valves and pressure regulators. But in this system to see what's going on in the various areas and pick out the errors were inefficiencies are occurring.

C.H.

How do you feel that we can encourage, I mean your scholarship that you have for Region III, to encourage refrigeration interest in young students. How else do you think we could encourage them to come into our industry? Any other ideas?

M.G.

As I see it schools, you might say the youngsters are exposed to would say automobiles and possible repair. Exposed to some of the electronic equipment and possible getting into that area. But there is nothing that tells them, now look this refrigeration and air conditioning field is an excellent place to go. It's a place looking for qualified people. So why not become qualified in that area. And because of what I see of the lack of such incentive being placed to the youngsters and I said well let's set up some kind of an award and go out and say now here's this award, you go into this field which is a good field and you can get some benefit from it.

C.H.

So that's the kind of advice you would give to a young person trying to enter this field. Okay. Anything else that you would like to say in wrapping this up? Any other comments that you'd like to address?

M.G.

Yes, I would like to comment on our refrigeration Handbook. It's an excellent book and I don't want to belittle the good things but I do want to point out the fact that there are areas in there which specifically are stated that these are system practices. Now the fact that they are system practices is true. But are they the best system practices? Because there are other practices available which in my opinion are better. So my quarre would be, that look if we wish to just stay with practices then be sure we put in all of the different practices and not just one in one particular manner.

C.H.

Okay. I'd like to thank you for joining me this morning, taking time out of your schedule to meet with me and to perform this interview at this Chapters Regional Conference in Philadelphia. Thank you Milt Garland.

M.G.

Okay, you're welcome.