ASHRAE Leadership Recall (formerly Leadership Recalled)
Transcription

Interview of: Bernard Nagengast

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Interviewed by: Ron Shelton

Note:

Ron Shelton

Good afternoon. I'm Ron Shelton. I'm a member of the Historical Committee. I'm participating in the 1993 ASHRAE annual meeting here in Denver, Colorado. And we're very pleased to be here this afternoon with Mr. Bern Nagengast. Bern is a consulting engineer from Sidney, Ohio. He is one of the co-authors of the soon to be published ASHRAE book on the history of HVAC and our industry. Bern is also a past chairman of the Historical Committee. He has written numerous articles on the history of our industry and ASHRAE. He's also a member of the Society of history for technology. And welcome Bern.

Bern to begin with I'm really interested in how you first became involved in the engineering profession and especially what sparked your interest in mechanical engineering.

Bern Nagengast

Well I think probably I guess I would have to go all the way back to my very beginnings. I think really I was born with a tendency towards it or a talent for it because I remember when I was a little kid being interested in all different kinds of mechanical things. Every time we would have a plumber come to the house or an electrician or something, I was right there to watch what he was doing. When I used to play with my toys in addition to all the normal things that you would do, I used to take pieces of string and tie them all together and try to make machines out of them you might say. I can remember a period of time when I used to take the daily newspaper and cut the gutter strips off of the newspaper. The white strips that surround the text and cut out the crossword puzzles and then take all those strips and crossword puzzles and lay them out all over the floor and connect them together to make systems of pipes and tanks and things of that nature. When I got old enough to start to be able to pick up a crayon and draw I used to try to draw mechanical systems and such on my coloring books and for some reason I had the ability to be able to block out the black lines that were on the coloring books in just see a blank page essentially. And then I would draw some type of a heating system or something as I envisioned the inside of a boiler for example or something like that and continue to do it for some length of time. And so I guess I had an interest in the mechanical side of things for a long time. And I went through a period of time when I wanted to be a plumber, I wanted to be an electrician, or this or that. And I think the thing that catalyzed my interest in this particular industry was the fact that my father was a retail florist and his shop, which was fairly good size, had a pretty good size heating system for the greenhouses and also had refrigeration systems to keep the flowers cool and I was always fascinated with those systems and used to spend sometimes as much as a couple hours just looking at those systems, going over,

following pipes and so on and so forth to see where they went in trying to figure out how the system worked. And when I was about oh, probably 14 years old or so they had to put a new walk in cooler in at the shop. And the guy who was doing the refrigeration work, I found out when he was going to be there and after school I went right over there and wormed my way into where he was working and asked him if I could watch him. Well pretty soon he started asking me some questions about if I knew what he was doing and so on and we ended up getting into an interesting conversation where he started asking me things about what he was doing and explaining to me how the system worked. And I asked him questions and when we got to the end of that day he said: "how would you like to come back on Saturday and I'll pay you to help me put the rest of the system in". Well I was absolutely elated. So I went back on Saturday with my dad when he went to work that morning and I spent the whole day with this man and at the end of the day he paid me a dollar for my help which was essentially just handing him things every once in a while. But the whole time I was asking him questions and he said when you get to be 18 years old, he said why don't you come and see me and I'll hire you for the summer. He said: "I always hire somebody to help me during the summer time". Well when I was 18 I went to him and by that time he had some health problems and had to hire somebody full time and he couldn't do it so he asked me to go ahead and go to some of the other refrigeration companies in the area and see if I could get a job with them. And one of the things that he told me during this period of time when I used to see him every once why was, he said: "you should go into this industry but you shouldn't go into this industry as a mechanic. You should go into it as an engineer". He said: "because I have to work long hours in all kinds of hot dirty conditions" and he said: "I really don't get paid much" and he said: "you should design the systems, not fix the systems". And he really encouraged me to go into the engineering profession. So when I was in high school I had pretty much decided that I wanted to go into some type of a technical design type field particularly something to do with heating and ventilating, refrigeration and so on because it combined all of the different things that I had an interest in. It combined electricity and piping and mechanical systems and the whole thing. So when it came time to try to select a college I got my dad to take me to Rensselaer Polytechnic Institute in Troy, New York which was of course one of the premier engineering colleges, to find out what an engineer did. And the guy who spoke to me frankly discouraged me about engineering because he really didn't give me, I don't think, a very good explanation of what an engineer did. It really didn't fire me up. And so I instead decided to get a two year technical degree in air conditioning technology at the local community college, Hudson Valley Community College.

R.S.

This is in Albany?

B.N.

This is, the community college was in Troy, New York which is located about ten miles away from Albany. Fortunately they had a pretty good program there and while I was there the department head of that school one time came in and gave a talk to the class and he said: "some of you no doubt are going to decide that you want to go on and get an engineering degree and I think that you should certainly do that and the best place in the world to go for an engineering degree and this field is California State Polytechnic College in San Louis Obispo, California". And my first reaction to that was this guy's out of his mind. I'm going to go clear across the country for college, but he was very encouraging of the idea and several of us in the class kind of discussed this among ourselves and we sort

of, you might say bootstrapped each other to the point where we all decided to go there. And so three of us transferred at the end of our last year at Hudson Valley to California Polytechnic University as it is called now. And I enrolled in their program which was designated in environmental engineering and with a specialty in air conditioning, refrigeration, plumbing and heating. And I ultimately got my engineering degree there and then stayed for an additional one and a half years and got a masters degree in business. And then decided to go to work. And I guess by that time I was so interested in this field that I decided I didn't want to stop learning after I graduated and so I thought it's important to try to go to work for somebody who can teach me something. And by that time I had been reading a lot of the trade press and used to go to any type of educational seminars or anything that I could to listen to people in the industry and I started to identify that there were certain people in the industry who seemed to be well known and seem to have a lot of knowledge about different aspects of the industry. And by that time I decided that I wanted to probably specialize in the refrigeration industry so I decided I wanted to work only for a few certain people in the country who I thought could really teach me something. And I applied for jobs with those people and it turned out that some of them for various reasons couldn't hire me and ultimately the job that I did end up going to was one with Copeland Corporation in Sidney, Ohio as an application engineer because the manager of the department at the time, John Grim, was well known within the industry for his expertise. And I thought I could get a good general education from him. So I spent the next seven years at Copeland Corporation working for him and learned a tremendous amount. In fact I was delighted to hear when I went to work for him, that the very first day he said to me: "if you stick with this job at the end of one year you'll be a walking encyclopedia of knowledge of the applications of refrigeration", you know, and that was just what I wanted. And it turned out that that did happen. Well at the end of seven years, I had for a long time started to think that I wanted to go into business for myself and so at the end of seven years I ended up leaving the company and decided to go into consulting engineering work. And at the same time I also purchased an existing mail order company that dealt in coin storage supplies since I happen to be a coin collector. And I did that to try to tide me over monetarily until I built the consulting business up. And it turned out the mail order business worked out pretty good and I had actually turned down consulting work. But that's really the story of how I got into engineering and why I was interested in it.

R.S.

When did you first join ASHRAE?

B.N.

I joined ASHRAE as a student member in 1968. That's when I was at Hudson Valley Community College and they were very strong supporters of ASHRAE. They encouraged all of us to become student members and we were fortunate that the Northeastern New York Chapter of ASHRAE, which operated in that area, was also very encouraging and they once a year had a student night where they would invite all of the students from the local area that had anything to do with the industry and sponsor them out of their own pockets as student members of ASHRAE for the first year. And anyone who wanted to join, and of course, you know, most of the class joined since it didn't cost anything. But the thing is that, and I really, you know, thought it was important to become a member of the Society even at that early time from what I had been told about the Society because I thought that it was important by that time, to be a good technical designer you also had to know a little bit of the nuts and bolts of the system and

so the next year I joined Refrigeration Service Engineers Society to get the more practical side of things and I've been a member of both organizations ever since.

R.S.

When did you first start going to ASHRAE meetings?

B.N.

Not until I went to work for Copeland. I really never went to the regular meetings until after I, you know, went to work. And fortunately my boss John Grim at Copeland who was an ASHRAE member was also encouraging of participation within the Society. He participated himself and fortunately I was able to attend some of the meetings, you know, once I went to work for Copeland.

R.S.

Somewhere in there you begin to develop an interest in the history of the technology.

B.N.

That's true and I think the, you know in thinking back it's hard to pinpoint exactly, you know when, that I could say when exactly I developed that. But I think what happened was the systems that I was exposed to back when I was growing up in Albany, New York at my father's shop and so on, they were older systems. And I think I somehow got a basic appreciation for this old equipment as a result when I started doing summer service work in between my quarters at Cal Poly the equipment I worked on in many cases was older equipment. And this particular company that I worked for during that time back in Albany, Capitol Refrigeration Company, their service manager had gone to work for that particular company in 1933 and he was very familiar with the older systems and the fact that I had to work on some of these older systems, I used to ask them questions about them. And he used to tell me a lot of interesting stories about this, you know, old equipment in the way that you used to have to work on this type of equipment and it got to the point where I started asking him questions that he couldn't answer. And that sparked my curiosity in terms of when things were developed and why they were developed and things of that nature. So when I went to Cal Poly I used to sometimes spend my spare time going to the Cal Poly library and looking at old issues of Refrigerating Engineering and things like that. And that further sparked my interest in it and once I graduated I maintained the interest just as a hobby, you might say in terms of trying to, when I would go to an ASHRAE meeting for example, one of the first things I would do is to try to find out if there was a good library in the town. And I would go to the library, you know when I had some spare moments and look on their card catalogue under heating and ventilating and refrigeration and see what kind of material they had and then if something struck my fancy I'd, you know go and take a look at it.

R.S.

Did you start writing any papers on the history of HVAC when you were in school or?

B.N.

The first article I wrote was while I was at Cal Poly when I was, if I remember I think it was when I was maybe a senior at Cal Poly or so. And I had by that time I developed a pretty strong idea that in order to be a good engineer you needed to not only have a good theoretical knowledge but you also had to have what you would call a practical knowledge of the, you know, as I had said earlier the nuts and bolts side of systems and equipment. And I also by that time had developed appreciation for what had been done before and I thought a good engineer ought to have a historical knowledge as well in terms of, you know things that had gone before him so he didn't essentially reinvent things all over again when he was

designing systems. And I went to the department head, Jim McGrath, at Cal Poly and I said, you know, told him about this and I think said do you think the ASHRAE journal would entertain an article from a student member of the Society. And he said I think that they would not only entertain it, he said I think that they would be delighted to publish something like that if it was a good article. And he said I'll tell you what, he said you write the article up and if it is a good article I'll send it personally to the editor of the Journal and recommend that they publish it. So anyway I did write the article and he took a look at it and he said, made some suggestions and the thing that was interesting was he said, if you publish this in the ASHRAE journal, this is going to be a very rigorous article and he said and you've got to be very careful about what you say and how you say it, because there's going to be some people in the Society such as, and he mentioned Bill Holiday who is still living, are going to see this kind of material and they'll tear it to shreds if you don't, you know, really do a good job. So anyway I ended up rewriting the article and after I rewrote it he thought it was pretty good and he sent it in. And they did publish it.

R.S.

And they did publish it? And what year was that?

B.N.

And it was, let's see I think it was published in 1972 if I remember right and it was the "Quest for Knowledge, A Student's Personal Viewpoint", is what the title of the article was.

R.S.

When did you get on the ASHRAE Historical Committee?

B.N.

Well the interesting thing is that it connects with this article because Jim McGrath was the, I believe he was the second chairman of the Historical Committee which was founded in 1974. And Jim McGrath knew of my interest in history. He also was aware of the fact that my senior project at Cal Poly for graduation was a historical project where I studied the design of refrigeration condensing units and how they had progressed in design. He apparently was the one who suggested to whoever was appointing members at the time to committees that I would be a good member of the Historical Committee and as a result I was appointed to the committee for the first time in 1974. And this was of course after I left Cal Poly and was working for Copeland Corporation. So I started coming to Historical Committee meetings and pretty soon my boss John Grim got somewhat miffed at the fact that I was spending company time going to meetings of a committee that really didn't have anything to do with direct technical type things. And he basically told me, well you know you can go to the meetings if they're fairly close or if they happen to conjunct with the ARI show where we would send you anyway but otherwise I really can't afford to send you to a meeting. So anyway because of the fact that I couldn't attend that many meetings I ended up not lasting on the committee for a very long time initially. And I think I ended up being dropped from the committee after oh, maybe a year or a year and a half or so. It wasn't too long after that where I was able to start to attend the meetings more often and I started to attend the Historical Committee meetings just out of interest in what they were doing and expressed an interest that I would like to rejoin the committee if that was possible and I was ultimately appointed to the committee once again. I think it was 1980 was when I was appointed again to the committee. And I have served in some capacity with the committee pretty much continuously ever since.

R.S.

They won't let you go.

B.N.

Yeah that's right. They found somebody who was willing to do, I guess do a little bit of work for them or something.

R.S.

When did this idea of about a history book for HVAC first come about?

B.N.

The thing that happened was the Historical Committee began to entertain the ideas of celebrating the Society centennial. And this really was, I suppose I could probably take credit for bringing that up initially because when I was chairman of the Historical Committee for the first time about 1985 or so, I suggested to the committee that even though the centennial was ten years down the road they really should start to prepare for it, starting ten years in advance because of the fact that it was the 100th anniversary and it was something very significant. And that you can't wait till the last minute to do something. And so I asked the committee to come up with suggestions for things that could be done for the centennial. Well it turned out that Barry Donaldson who was a member of the committee at the time was really the one who suggested the book. He suggested that the Society publish what he called the catalog of heating, ventilating, air conditioning, and refrigeration history. And that was in 1985 that he made that suggestion. Well within a short period of time we entertained a lot of different ideas and the committee distilled the ideas down to just a few ideas one of which was this book. By that time the idea had jelled to the point where we started to think in terms of pictorial history, primarily a pictorial history. And I think that, you know Barry certainly thought that was a good idea. He volunteered to write the book but he mentioned the fact that he really wasn't particular proficient in the air conditioning and refrigeration history side, that his forte was more in the heating and ventilating side. And so I piped up and said that I would be willing to work with him on the book, you know on the other side of the subject, the refrigeration and air conditioning history. And that's how we became coworkers on the project and we've been working on the project since 1985. And of course we realized once we got into it that it was a pretty big undertaking and we realized that we couldn't cover the entire industry because you'd be writing an encyclopedia in that case and so then we decided to be more selective in terms of covering various aspects particularly important milestones and I think as time went on we realized that what we wanted to do was to point out some of the things that really affected the impact of the industry on the human race. You know the fact that this industry had an immense impact on people that that we have a tendency to take for granted now. The other thing, challenge, was to make it interesting because you know , unless you're a dyed in the wool historian nobody's interested in reading history.

R.S.

Pure facts.

B.N.

And that's right and most of the material that has been published having to do with the history of this industry was primarily text type material. It was interesting for somebody like me to read but it certainly wasn't interesting for most other people to read I don't think. And so we wanted to try to do something that would present the history in an interesting way so that people would pick up a book and say wow this is really interesting stuff in here to look at and even if they just looked at the pictures and didn't read anything. You know they would want to do that and if they started reading some of the

things they would find all kinds of interesting things to read and so we tried to interject humorous anecdotes, things of that nature.

R.S.

That's true. You know some of those kind of personal anecdotes, that'd look like it'd be a little difficult to established information for that but apparently you found in the literature of it.

B.N.

Well the thing that's interesting is that when I went back and started to look at the things that had already been done, I would find, you know, somebody would talk about some particular individual had invented something or had done something at a certain time and maybe they would tell a little bit about what they had done but they dropped it at that point. And to me it was interesting to go into why did this guy do that, you know, was there anything interesting about that, how did this thing that he invented, why was it important, how did it work. And so I tried to do research into that particular thing and it turned out of course that for, as usual with anything that you have to write you have to do about maybe a 100 times worth of research for every little bit that you write. And the research really was the thing that was very, very time consuming. In fact the writing in my estimation was quite easy to do once the research was done. But you know I think that's because I seem to be able to, after I do the research, I can mull it over in my mind, you know for a while and then be able to put it down on paper pretty rapidly. And I thought about that for a long time as to why I can do that because it sometimes amazes me myself that I can do that and I think it's - I remember reading one time some material by Napoleon Hill who studied the life of Andrew Carnegie. And he was the author of books like “Think and Grow Rich” and things of this nature and he had something in his books where he talked about the ability of people to tap into the subconscious mind which in turn allows them to tap into what he called infinite intelligence which, you know, is the concept of God. And the thing that's interesting is that I thought about maybe that's what happens when I write this material that I do a lot of this research and I basically absorb this material and it gets muddled over in my subconscious mind and next thing you know I have an idea of how I want to write it and when I sit down to actually write the material the material comes out faster than I can put it down usually. I mean I can't even write it as fast as I can think the material out. And usually when I write it I'll let it lay for a while go back a week later and look at it and I think to myself, gee did I write this? It really is almost like this material came from somewhere and it wasn't a conscious situation. And it did amaze me that I wrote the material sometimes.

R.S.

Where did a lot of your visual materials come from? I mean obviously that's a major portion of the book. You captured a lot of that through industry journals.

B.N.

That's right. Well one of the things that I found out was that I understand why people who did historical material before didn't use a lot of pictures because that is even harder to get then the research material from the text stand point. It's very difficult to get the visual material. And what I really did was, essentially it was a matter of going to every source I could think of where I might be able to locate the material. Some of the material came from industry type archives such as material on household refrigeration that came from the General Motors' Institute Collection of Industrial History or the General Electric Hall of History or places like that. But you're right that a lot of the material had to come from industry journals. And unfortunately they aren't necessarily the best reproductions because they're

halftones in magazines and so on but the thing is that that's the best we have available in some cases because the original photographs that they used, you know, usually have long since disappeared by now and there's no way that you can access the material directly. But it was really a matter of, you might say, looking for a needle in a haystack. I found out that a long time ago, that the only way that you can really find the good historical material is by sheer legwork and sheer tenacity in terms of having to take for example, a set of industry journals and start at the beginning and go page by page through every single one of them. And you know you may be talking about 1000s of pages of material to have to process to do that. But that's how you find the really good material because a lot of times if you take the short cut method that researchers usually do which is to use indexes, the indexes leave out a lot of good material. And a lot of times the title of an article won't tell you what the article actually contains. For example if you're going to study the history of air conditioning, if you go back to early articles dealing with the subject, air conditioning isn't the term that 's used. For example an article that's entitled The Refrigeration of Dwellings, you know, might be a title of an article that deals with the air conditioning of dwellings as we know it now. But you would never know that from the title unless you saw the article right in front of you and saw what it dealt with. And it's, the whole thing is a matter of, I guess, putting together a jigsaw puzzle. You know you find a little bit of information here, a little bit of information there and gradually it all kind of fits together.

R.S.

I presume you had a lot of material to cover the later periods. What about the material for the earlier times, because you started in the-

B.N.

We really started with ancient times and went forward and of course there isn't a lot of material in ancient times because there really wasn't a lot done. You know the cooling technology virtually didn't exist, refrigeration technology didn't really exist except for the use of snow for example to cool wine or something, and heating technology and all that. We're talking about really the ancient Romans for the most part and then for a long period of time there really was very little technology in the so-called dark ages period and it isn't until you get to the Renaissance period that you start to see and the industrial revolution. After that that you see a blossoming of the technology as we know it today. And of course the, what happened was, you had the basic developments of science and technology back then and you get to the point where when you get up to about the 1930s or so, at that point a lot of the basic discoveries have already been made and from that point on we're talking about a refinement of the technology. And for that reason Barry and I chose to not deal with the technology beyond the 1930s in the book for that reason and also because it starts to become very difficult to judge history when you get too close to it. We can tell now, 60 or 70 years ago what were the really significant things that impacted this industry for a long period of time. But if we talk about something in the last 10 or 20 or 30 years it's very difficult to tell whether that's just a flash in the pan or whether it's something that really will be considered to be historically significant as time goes on.

R.S.

You know I really enjoyed reading the parts of the book about the formation, for example of ASHVE and how the engineers broke apart from the Master Steam Fitters. I can understand that as an engineer wanting to get on with the engineering part of it apart from the business side of the house and I presume a similar kind of thing happened with ASRE.

B.N.

And I think the most, probably the most challenging history to write was the history of the organization itself because that material is the most difficult material to make interesting to people. You know unless you happen to be one of the people personally involved in something, you know, you don't particularly want to read about a lot of these types of developments having to do with the organization of a society and so on and so forth. But the thing that makes it interesting is when you can get back into the, again the personal anecdotes and the reasons why the Society was formed and that's what struck me when I started working on that particular part of the history was why was the Society formed, who formed it, why did these, a group of individuals, get together and do this. And I found out there were some very interesting material relating to that. Some very human material.

R.S.

I guess it took someone like a Hugh Barron, with that type of personality, to get that organization started.

B.N.

That's right and essentially he thought there should be another organization because he didn't like the way the science of the industry was being treated by the Master Steam Fitters Association. And that's really, you know, in a capsule form what happened.

R.S.

Well Bern I'm certainly looking forward to the publication of your book. Do you have any future plans at this time?

B.N.

I have no doubt that I'll continue to publish articles and things of that nature, you know, probably for the rest of my life in this particular area because of my interest and I do think it's very important to share the knowledge. I think the fact that if I had, you know, the time and the ability to go out and dig out all this material and everything, it doesn't belong just up in my head. It belongs in the hands of a lot of other people, that they can take a look at it. And I think that it is important to take what I discovered and to try to put it out in an interesting format so that other people can, you know, get the benefit of the work that I did. That's the reason why I think it's important that the background material for the book, the research material and the illustrative material and so on, all of that material we're going to turn over to the ASHRAE library and archives so that it will be available for other people to use down the road so that they don't have to go trekking all over the country to all these different libraries and sources and things and trying to dig this information out. We'll have it all in one spot.

R.S.

Well Bern, I know you've spent years contributing segments to other people's publications and books and I'm very happy to see that you've got something out there that's unique to your own authorship.

B.N.

Well I guess it was just a matter of, you know, when somebody else is doing something, if they find out that somebody can help them out, they've got something they can use, of course you know it saves them a lot of work and I'm all to willing to help them out if I can.

R.S.

Well I've certainly learned a lot from our association over the last two three years and I must admit I've enjoyed trekking through some of the better libraries in Washington with you and seeing some of the things that they pull out the patent office and searching through the Smithsonian.

B.N.

You just have to be prepared to be, to work and get hot and dirty and that's what happens. I think some of these old materials that I look at, sometimes nobody has looked at them in 50 years because they're covered with dust typically.

R.S.

Well ASHRAE's very fortunate to have someone like you Bern who has certainly put in does countless hours as a volunteer to produce a document of such quality and significance to our industry.

B.N.

I don't think I should get so much credit really, you know what I did anybody can do. It's, the material is out there. It isn't like I, you know, invented all of this information. It was there and it simply takes the time and effort to go and look at the material.

R.S.

It takes a lot of tenacity and certainly a certain type of personality to go after that.

B.N.

Yeah you have to be nuts!

R.S.

Somebody that used to sit and assemble crossword puzzles on the floor when you were a kid.

B.N.

Well maybe so.

R.S.

Bern, I want to thank you very much for sharing your time with us this afternoon.

B.N.

That's okay Ron. It was a pleasure and I encourage anybody to do the same thing.