ASHRAE Leadership Recall (formerly Leadership Recalled)
Transcription

Interview of: William P. Chapman

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Interviewed by: Mike Kearney

Mike Kearney

Good morning. My name is Mike Kearney and this is the thirteenth of June and we're in beautiful downtown St. Louis, having suffered through another Cardinal loss to Pittsburgh. It is my pleasure to find interviewing Bill Chapman past president of ASHRAE for the years 76 to 77 and an F. Paul Anderson award winner in the year 1983. And Bill it's my pleasure to have you here this morning and we've been chatting a little bit prior to getting into this and I think we ought to start your interview with a little bit of how you got into the air-conditioning industry in the first place. Went to the University of California, in Berkeley I understand.

William Chapman

That's right Mike. I was working at the time for a professor that was active in ASHVE, one of their predecessor organizations of ASHRAE. And he was given a research contract with the Copper and Brass Research Institute to develop heat loss calculations and thermal balance in panel heating as we called it then where pipes are embedded in the floors, ceilings. The problem was a very tedious problem, took a lot of time. We didn't have computers in those days so he needed several students to do this to get the job done in time. I was able to get the work done by a shortcut technique that was completely valid and it apparently impressed him so when I graduated he kept in touch with my wife, I met her at Berkeley. He moved on to Purdue as a full professor and when the war was over he gave me a research fellowship to come back and continue in that same type of research. I did and I stayed at Purdue long enough to get my Masters degree but the research work was still not finished as far as it can go. Typical research, it almost goes on and on and on. You learn more problems than you solve. And I was interviewed by a group of engineers from US Steel. They were interested in doing that work and that was in '47. I went to work for US Steel and February of '47.

M.K.

Why were the steel companies interested in the-

W.C.

Well they sold the pipe. And they wanted-

M.K.

So there was a lot of pipe.

W.C.

A lot of pipe. There was a marketing thing for them. First of all, they wanted to know if it was going to be practical. That later developed into snow melting which was really the pioneer work that I did that I think that led to the Paul Anderson award that I got. Because of their research work I elected to go with

US Steel. I was going to stay in the industry, I determined that because I realized it was a lot of engineering challenge. And in 1947 I joined ASHVE. It's been a while but I have a few years to go before I can claim to be a 50 year a life member.

M.K.

Well you got some good claims already. We know that. So you had your masters out of Purdue and you went with US steel.

W.C.

US Steel. National Tube division of US Steel.

M.K.

And then you got involved in ASVE in 1947, ASHVE I guess it was. ASHVE, heating and ventilating society. And then you became involved in working at the society level on technical committees.

W.C.

Well at that time the society recognized that this was a new way of handling heat losses and there were four panels set up, A, B, C, and D. and there were several important ASHRAE, I keep saying ASHRAE excuse me. Important society people involved with that. One was a later to be president, Ben Gordon. And my professor, Hutchinson was interested in that. And these technical committees, we call them today, were set up to study different aspects and because I was doing that kind of work I was put on one of those panels. And my first panel assignment, what we would call committee assignment, was in 1948 and I'm really quite proud to say that I haven't broken that string since. I've had a society committee assignment now for 42 years.

M.K.

That's a mixed blessing but a very much an honor and distinguishing characteristic of service.

W.C.

I wouldn't say was mixed. It's been time-consuming. But it's been very, very gratifying. There's a lot of satisfaction to contribute something and I think when you do it on a volunteer basis it adds to the feeling of satisfaction you can get.

M.K.

I think you're right. I think that's one of the remarkable things about ASHRAE as an organization. All of the work is essentially volunteer and the results when you walk through the bookstore or where the papers are on display just from this meeting is really quite impressive. And when you realize all of this is volunteer. And any single thing doesn't strike you so hard but when you look at the accumulated literature and the transaction and the journals and the guides it's really quite…

W.C.

And the scope of that work.

M.K.

Yeah, the scope of that work.

W.C.

In the scope of that work. You consider food technology and preservation and what that has done. The current impact of CFCs and what that means and how the refrigeration industry will have to go back into the laboratories and develop new refrigerants. Solar heating. And by the way my thesis at Purdue was on solar heating. So when the energy crunch came along in the 70s, it gave ASHRAE a boost. It was also,

sort of a fulfillment as it were, that the world is beginning to realize how important our energy sources are and we should look beyond what we have done in the past and look to the future technology.

M.K.

You were president during the time of, I say during the time of the what we call the energy crisis or at least heightened energy awareness in the 1970s. I guess technically the Arab embargo occurred in '74.

W.C.

October '73 was I think the embargo itself.

M.K.

But your presidency and 76 and 77 was very much involved in the reaction of our society and our industry to the heightened awareness of energy sources. Do you want to describe a little bit about that?

W.C.

All right. Actually ASHRAE had done most of its work prior to that. I was on EXCOM, our executive committee, I was an officer a vice president when we met in Los Angeles and the Bureau of Standards presented to us some work that they had done and asked ASHRAE, we were ASHRAE by that time it occurred in '59, to pick this up and develop a standard. We had the machinery for doing it. We also had the prestige for doing it. Rod Kirkwood was president at that time at the presentation in Los Angeles and it was just an earthshaking requirement. We were stunned by the magnitude of the work that was to be done but the government had been, and Department of Interior and there was a secretary Morton, that had been warning the United States and economists had been warning the United States since the late 60s, that we were more and more dependent on others for our energy. Our energy sources are finite. A lot of work and been done in that respect. Our coal and our oil in the world could be reduced to energy units call quads, those are Quadrillion BTUs as a quad. And the storage of that energy in the earth is measurable and frightening, shallow. And I don't mean feet beneath the surface of the earth. The storage bin is pretty close to empty in terms of what we would have imagined. That's been challenged by many but I think most thinking people were aware of it and ASHRAE probably represented, as a society, the greatest body of learned people to appreciate the seriousness of this. Consequently we were certainly the ones to write the standard. But standards take a long time to write. And the pressure to get this done, if we didn't do it may be a voluntary standard would not be developed. Maybe the government, fellows so critical, they would take it away and they would do it and force it. Though that was important to the government people they didn't want to do that either. So there was this challenge. We have to eat this elephant by noon time today because we got a big meal coming up later tonight. And that got us started and we set of panels and I no longer can remember the thousands upon thousands of hours and hundreds of people that got involved in different sections of those panels, and they were broken up into sections. A little bit later maybe a year later there was, under president Rickleton's term, under a determination that the magnitude of the job was such we probably should simplify it and we are more knowledgeable in energy conservation within the building walls so let's not get involved with the resources themselves. It was recognized that if we are speaking of energy conservation and that we should really start with the source, the resources that we have. The oil, the gas, the coal. We would be restricting our efforts of writing a standard that was truly designed to preserve our fossil fuels to the fullest. We felt that are expertise with such that we should limit it to the building walls. And I remember I voted for that. I remembered wrestling with that, that concept. In a way it's not right but in a way it's more practical and I think we will be more credible

to the world. They will accept our work because everybody would have to admit that we do understand energy inside the building. But a year or so later a short time later, Rickleton was bombarded with requests that this is too shortsighted, it's incomplete. We have to go further if indeed we are going to conserve, preserve our fossil fuels. So he set up a subcommittee if you well at first to write something on what was then called section 12. And those two men were Bill Coad and Harry Phipps. Bill Coad of St. Louis by the way. Still active, very active in standards. Harry Phipps died several years ago. And they did present something and to put it mildly it was controversial.

M.K.

It's not unusual for Bill Coad. Bill Coad calls it the way he sees it and he sees it.

W.C.

But there were elements that felt that we should remain inside the building walls. And other elements that fell we should go out. So the election came to the board again and I reversed myself and I voted to go the way we were the first place and regretted the fact that I had voted to restrict it to interior structure. That took a while, I guess, before section 12 was ready to present something. And the other sections, 90.1 and such were ready to go and these were released and we called it standard 90-75 if you recall. But the basic issue of whether or not we would be able to complete our work and go outside didn't really come to a critical point until I was president. And I will never forget that meeting was in February 1977 in Chicago. In the board meeting was on St. Valentine's Day I believe. I remember certainly that the Plenary Session was St. Valentine's Day because I quoted Al Capone. And we just about-

M.K.

What did you quote from Al Capone?

W.C.

Well you can get an awful lot accomplished with kind word in a smile but an awful lot more with a gun. And there are times when you have to take strenuous efforts to make it go. So it was at that meeting that we did vote to reinforce our position that we would continue to study the total picture of energy resources. And it's a term that is, two terms in fact came from that, called RIFs and RUFs. Resource Impact Factors and Resource Utilization Factors. And they are no longer used. It was a very complex way to compare the energy that's used. How much energy is lost in transmission. What is the true impact of energy in the building on our resources that we have that have yet to be taken out of the soil, if you will. But at least that position reaffirms that ASHRAE would stay with it and release the rest of standard 90 so it could go forward. I believe the, that section 12 is now standard 115. That the number that you should check with staff. I think it is standard 115. But without question that was the most important part of my administration. You might say the last six months were anti-climax but as presidents are into this day, they are interviewed when they go into the city, the press picks it up, I was always asked if energy was still key issue, paramount in everybody's mind. It was newsworthy, we haven't really resolved it. And that gasoline lines wern't I as long as they had been a year or two before but people were concerned about it. And frankly undisturbed that that memory has slipped away. I talk to people in there isn't the same awareness that are energy sources are limited.

M.K.

Well I think within our profession there is a very active awareness that I think in the public mind it has ceased become a daily topic. I think that we are in the eye of the hurricane in that regard and I think that your point.

W.C.

Right. Exactly. The ASHRAE people haven't lost. I used to speak to Rotaries. Invited to go out to speak to people and there was an interested audience.

M.K.

And really, still in that circle I think Rotaries are very international as a great international awareness and I think in civic organizations like Rotary, the people who are aware internationally remain concerned about the energy consumption globally. Let me understand something from my edification here Bill, the standard 90-75, the -75 means it was put out in '75. Your administration was '76, '77. Are you saying that it was really approved and stamped as a standard. I know there's a lag somehow there but I'm not clear on that.

W.C.

Standards are reviewed and they are put out for critical review and before they can be released they are, they are temporary are tentative standards. But there were several sections of the standard 90.1 I believe. The 90-75 is what we think of, I think was the first one that was released. In that was approved but it wasn't complete. We did have all the sections that we needed would come later. There was another series, standard 100, followed along on building renovations in existing structures were standard 90 was for new buildings. In that sense you are right that you can hardly speak of a standard of that scope as a standard. It's a series of standards and they evolve and they go.

M.K.

It certainly, during the administration and began to be public knowledge and on the street. That's what you're saying and give us a feeling for the effect on ASHRAE of a standard that had such broad political ripple. I mean we were impacting other organizations and other trades and crafts quite heavily.

W.C.

Yeah, I can speak to that in two respects. Shortly after the embargo in October '73, the Wall Street Journal ran an article on the seriousness of this energy in the seriousness of our dependence on imported oil and what it could mean economically as well as what it can mean to our comfort, what it can mean to our cost of doing business. It's so far-reaching. Energy is a basic elements in our economy, in the world for that matter. It was an extensive article, typical lead article in the Journal. And though one or two of our members were quoted because they had worked in energy and were recognized as people who understood the impact, ASHRAE was not mentioned at all. I spoke to one of those of our members that had been quoted and he, asked him why he didn't mention it. What an opportunity for us to get some publicity. He said that he had but it was stricken because nobody would know what was. Nobody would know that there was such an engineering society and it was immaterial. The message was key but who. Not so today. There is no lack of publicity today on what we have done.

M.K.

I don't know. I still think that in certain circles ASHRAE is very well known. But I noticed that here in town the Post Dispatch hasn't picked up on the fact that this meeting is here. And I think there is too many issues. The issues of today, the CFC issue, and the-

W.C.

Pittsburgh's in town.

M.K.

Well Pittsburgh, yeah that hasn't helped. We've had a lot of trouble with that. Before we leave the issue of standard 90, sort of describe a little bit some of the big political players. When ASHRAE put the standard on the street there were a lot of political camps that became aware certainly then that there was an organization called ASHRAE.

W.C.

Oh, yes.

M.K.

And that the people involved with the refrigeration and comfort conditioning arts were making a statement about energy and there was a reaction. Tell us of some of the folks who were reacting to that.

W.C.

Well, even in the design area, even the architects. They were very concerned that our standard would be prescriptive. In their terminology meant that the standard would restrict their choice of designing, what they might do. We argued that that was not the case, it really was not. We had a section 10 in the standard that allowed us to design an alternate system and if the energy utilization of the alternate design was less than the primary design that followed, the architects would call it prescriptive design, it was accepted and it would be acceptable. Some of the examiners thought it was so complex. How can we enforce this?

M.K.

Building code inspectors is that what you're telling me?

W.C.

Right. They had an influence. We had an ongoing, for two years after I left office, meeting with the architects and what they wanted to do. You want to get some research grants from the government and do some research and come up with some standards of their own. They really didn't want to endorse this and it was difficult. It caused conflict. I think the public would've been better served if the design professions would have had a united front and felt comfortable. But something of this magnitude is bound to develop different concepts, different, I shouldn't say bias in the sense that someone refuses to look at things in another way but they have one kind of view. They look at it in this direction, somebody is looking at in another direction. It's hard to bring this together and show that it is a common good. Much of that has passed with time not because we don't have the same crisis today but I think the understanding of how it can be done has been more comfortable. Then of course there were commercial interests. There was a pressure to the government through its agencies, the Federal Trade Commission wanted to impose restrictions that the refrigeration compressor in their home refrigerator would have to have certain energy requirements. And the question was would the public buy it? Would the market be hurt? Well obviously the manufacturers were very, very concerned. They had a tough choice between energy efficiency and marketability. Those issues had to be resolved. Many of those types of negotiable issues if you will took years to straighten out. It went on without notice really. And yet the Federal Trade Commission, you know when they would have their own panels, consumer panels, the fellow Ralph Nader, there would be consumers and I remember at a

hearing in Washington, well I'm a consumer. I buy a household refrigerator. But you don't count as a consumer. But I'm a consumer. But you're not a woman. Well that's true, I won't argue that issue.

M.K.

I want to get to your career with Johnson Service before we leave the offices in the format that ASHRAE has, I would like you to comment on ASHRAE as a forum for that kind of discussion, where you have strong political pressures coming to bear on an issue, a document that is going to have really an effect on how buildings are designed. The architects were right in that it's going to affect them, I think you make your points strongly and I would agree that it wasn't a prescriptive code or standard. But when ASHRAE now publishes a standard it has an effect for sure. Now ASHRAE as a forum, the committee work that you've been involved in since 1948. I mean those committees are forums for sure aren't they?

W.C.

Yes, many of the committees though of course when I first did any work it was a very, very low level, it was purely technical. It would hardly be considered a forum. The committees like our Handbook Committee, or things are being published they serve as references in the field of forensic engineering. If an architect or engineer designs structure and it doesn't work properly for whatever reason, if they can't show that it was designed in accordance with the guidelines set forth in ASHRAE publications they have a more difficult chance to defend themselves. From the other hand they can call up other expert witnesses and say yes this was designed as a prudent designer would do. There isn't an obvious fault. This is not a question of direction or duty, negligence.

M.K.

He was following the practice of the time. And I think that's one of the things that ASHRAE really does a good job of, is publishing our practice at this time.

W.C.

And keeping it. So this time is always this time. We roll over our handbooks in a four-year cycle now and it's hard for technology and design practice to change much faster than that. But it's true, ASHRAE is a forum, is made up of people, to put it crudely don't have an ax to grind. Where I have a 501C3 we don't lobby. We can appear before legislators, city, county, state, federal. And as technical professional people we are not there to lobby. We're there to give our advice and our opinions. It's one of the loftier aspects of ASHRAE and not many people recognize that.

M.K.

It's an interesting society from that respect and a rewarding society. Tell us a little bit about your work with Johnson control. We haven't mentioned that yet but you came out of the, when we left your career you were going with US steel and so somehow you got to Johnson so I want to get into that a little bit.

W.C.

Alright. As I said it became a member and I wanted to stay in the industry. The work that I was doing with US steel, the research work I was able to finish up most of what my first assignments by the time I had been there for four years. And then I wanted to take it out into the field to the designers so it would be used. There was no point in just writing papers. In the meantime an interest was being developed on snow melting, worry about the ice and snow in front of emergency places, hospitals, firehouses, toll plazas and such things as that. So it was the same thing. Coils were embedded in

concrete but it was outside as opposed to being in a building. We were handling materials that wouldn't freeze when it was turned off, it was considerably different. And then quite proud of the fact I wrote the first chapter. I developed the equations that allows you to design a snow melting system and on a rational basis and that is still published in today's handbooks. And I did that work in 1953 I think when it was first published. I think that's what led to the award of the F. Paul Anderson metal that I got later.

M.K.

Describe that a little bit. Describe what the purpose of the F. Paul Anderson is within ASHRAE.

W.C.

The F Paul Anderson medal is ASHRAE's highest award and is granted for achievement, meritorious service in technical field. You have to make a contribution to the knowledge of engineering in our field. As opposed to the Distinguished Service Award that you provide meritorious service but on committee work which is truly service. The F Paul Anderson award you might say is a more just above a fellow. Your granted a fellow for work of technical achievement. The reason I might be unduly proud of the medal is I feel that professional people like engineers have four responsibilities. First of course is the responsibility to yourself. If you don't have self-esteem you're not going to be able to do much for anybody else. And your second responsibility is your family who you start that with your brothers and sisters just as a toddler. You do have a responsibility to your family to be a good family member and as you get older and you get married and have children your responsibility changes nonetheless it's a family responsibility. Then your next responsibility is to your community. You can do that through PTAs or Boy Scouts or school boards or village trustee, any of a number of things. You nonetheless post something to your community. But the fourth responsibility is to your profession and if you fulfill that responsibility then you're also was on your responsibility to your employer. But that's hard to measure. Have you really done something for your profession? Have you really filled in a little grain of sand and that canyon of ignorance or is it all fluff? When you're given an award like the F Paul Anderson award there's a peer recognition, your fellow engineers agree that you have done something worthwhile.

M.K.

I would certainly think your pride is justified in that. I think it is that highest award of the society. It can only be given to one person a year and everybody in the audience when it's given takes pride in that recipient at that time. I think that's just an exciting time.

W.C.

Oh, it is. And we try to, that's another thing that ASHRAE does quite well. We give our honors and we try to bring people up for their moment of the limelight, as it were, so they are recognized for what they've done.

M.K.

You mentioned earlier that there is only one president and after you've been president then you are no longer the president but once you've received the F. Paul Anderson Award you've always received that.

W.C.

That's true.

M.K.

That stays with you.

W.C.

That is true. You wear your ribbons forever. Speaking of the presidency I remember when I retired as president in 77, I was talking to our industrial psychologist at Johnson Controls as I didn't realize this but I really think my experience with ASHRAE has added one other thing. I have been given such an experience in retiring. You're president in ASHRAE and dealing with something of national importance, really big issues, none of this makes busy kind of stuff that you frequently have to do. And then the day you turnover the gavel you drop to vice chairman of the nominating committee.

M.K.

Precipitous.

W.C.

Where? What happened to him? But you adjust to the, what some people find difficult when they retire in that they are not needed anymore. It is really a psychological threat to stepping away and it becomes frightening really frightening to some people. Gosh, If I'm not needed what am I doing around here? I did notice that and I really then started preparing for retirement and I retired in January of '85. And speaking of volunteering I'm volunteer director of the science Museum in Milwaukee. It's an 8 to 5 job. I spend that full-time, going in there until we can raise enough money to hire somebody.

M.K.

That's a very interesting thing.

W.C.

This problem were trying to hit is this science illiteracy. Math and science education in the United States is abysmal. In recognizing it as a problem, I said well getting involved with the science Museum we could really go after that problem and do something significant.

M.K.

Let me digress and do a little politicking here if I may. In our Historical Committee meeting here in St. Louis one of the line items for investigation is what does it take to create a museum or an archive of the refrigeration and comfort conditioning arts. There is no dedicated place as such that has a national stature. Our profession creates economies. I've got documentation in my portfolio there from New Zealand that had virtually no economy until a refrigerated ship in the year 1778 (Ed. Note actually 1877) brought sheep carcasses on a 90 day voyage to London and sold them at a profit. And all of a sudden that great land of New Zealand was able to raise considerably-

W.C.

Just by packing it in ice.

M.K.

Well now they had a refrigeration plant on board.

W.C.

In what year?

M.K.

In the year 1778 (1877) the refrigerant was air. It's a remarkable apparatus and it wasn't the first. It wasn't the first but the point I was making, refrigeration, mechanical refrigeration has literally made the economy of a country called New Zealand. Now when you take that kind of an impact, certainly on the New Zealand people, everybody here in this country has been impacted by the ability to use refrigeration and cooling throughout their life. And there is no repository for the archives of men and women and the machinery to do that. In our little committee were trying to figure out how would you

go about this. You know, how would you do that? How would you put people together? Patrick and I, no Patrick wasn't there. But I was in a museum in Seattle that is for aircraft. A very nicely maintained building, of course aircraft are big, you know we think air-conditioning stuff is big but aircraft is certainly big. They're hard to collect. And they're doing it. I think it would hurt my feelings if we get to our Centennial in 1994 and haven't at least started that sort of thing.

W.C.

Well I do know that museums can be self-sufficient. You have one right here in St. Louis, the Magic House. There are no funds from the city, the county, the state. They have a relatively small list of members. They are essentially living by their admissions fees. They don't have a gift shop and they have, being a director of the Museum in Milwaukee, every time I go somewhere I take a postman's holiday, you know, walk into the museums. You have a very fine science Museum in Forest Park but this message house-

M.K.

Have you been to the transportation Museum?

W.C.

No, no.

M.K.

Do tell me about the Magic House and I'll tell you about the transportation Museum.

W.C.

Strictly speaking the Magic House is a children's museum as opposed to science museum but the point I'm trying to make is it's not at all inconceivable that ASHRAE in Atlanta, next to its headquarters, could acquire property and establish a museum and charge admission fees. If it's done cleverly so that the exhibits are presented in an entertaining fashion, that is what I have learned, people come in to have fun and enjoy it. It wouldn't just be our membership.

M.K.

And learning can be fun, it can be exciting. That's an interesting idea because Georgia Tech is right there. I think whatever is established needs to be a teaching the vehicle also not just for the general public but for people who are in the front line of research at that time.

W.C.

Yes, that's education in its broadest sense it's obvious that is there to show progress and why in the relationship of one thing to another. Why this was successful, why this wasn't. It is entertaining. It is true I will admit that people will take their children to a museum or their grandchildren to a museum more often than they would go to the museum alone. Because they want to help their children acquire an education, they feel they have that education so there's that added incentive. And that in turn puts a little different slant on how it is entertaining, why it is entertaining. It's always fun to be fooled, you know. It's even more fun to know how it was done. So you can put things in sort of a magic-

M.K.

Where is this Magic Museum? I don't know..

W.C.

516 S. Kirkland.

M.K.

516 S. Kirkland.

W.C.

Talk about politics and the plug.

M.K.

Well that's a good plug for that. The transportation Museum is out in and it's a collection of railroad, engines and trains and that takes space. And bless their hearts there sitting out there in the open and volunteers, and here again volunteers, are maintaining them in restoring them and trying desperately to save that heritage for generations to come. But it's a tough challenge but it's there. It's acres of railroad cars. Now you have a list of points that you were hoping we would make in this little interview and I don't want to miss any of those particularly but how are we doing on your list?

W.C.

Well we're doing quite well because without question standard 90 was, I can't think of anything was in second place and we spent quite a bit of time on that. You asked me how I got with Johnson Controls in my wife always accuses me, when you asked me a question be careful. What time is it and I'll tell you how to build a clock. And I have strayed, every time you asked me that I've strayed down to something else. But I had been active in ASHRAE again and the branch manager in those days called Johnson Service Company was also a very active ASHRAE person. And he asked me if I would be interested in becoming director and research for Johnson Service Company and I said I'd be delighted to do that. I was interviewed, obviously got the job in 1956. And I moved from Pittsburgh to Milwaukee and became director of research and then vice president of operations and retired in '85. That was the root and I never did get back to California except for visits.

M.K.

Your peers and your superiors at Johnson control, were they supportive of your work in ASHRAE or how did they view all this committee work?

W.C.

Well, in fact the man that was president when I was hired had been active in ASHAE and VE and he knew how much time it took so we did have a corporate policy that you could get on the board of directors. You cannot get a job of that level. You could take any number of committee assignments. So he retired and then his successor came in, was not quite as stringent in that respect. And then when he retired our president who had just recently retired had been in sales department and he felt that ASHRAE had lots and lots of members in all of our branch offices. We used to, the branch manager was a member of ASHRAE. So he felt it would be a very worthwhile thing. He changed the rules so I was then allowed to go on and I went on the board of directors in 1969.

M.K.

That's started your walk through the chairs and then you got involved in that at that level.

W.C.

And then got into Excom in '71.

M.K.

Well it's been a rewarding walk for you I'm sure.

W.C.

Oh yes. In fact there's another bit of advice, while the unknown things about this. I used to speak to my young managers to get active. Not necessarily in ASHRAE. Being research we had people that were in IEEE and ASME and a number of different organizations. You learn something in dealing with a society

through committee work that's very, very hard to learn as an employee where everybody's employee of the company. And you're bringing diverse ideas into a group with consistent policies and purposes but they're coming at it from a different angle. And obviously you have to be persuasive. If you can't get someone else to accept your ideas is not going anyplace of course. And that training I think is valuable. In committee work it's challenged, its maligned, it's ridiculed but there is no form of communication comparable to a committee meeting.

M.K.

That's right. And at least they made the camel eventually. They got the camel out.

W.C.

We wouldn't have had a camel to have been for committees.

M.K.

I think it's time Bill that we let you take a look in your crystal ball from your experience and give you an opportunity to say what you see coming up, the challenges for either ASHRAE or our industry ahead. What kind of issues do you think we're going to be faced with the need to address as we go ahead?

W.C.

Alright. It's rather obvious I believe that computer technology is moving into all aspects of industry. And that's going to be a significant advantage in energy conservation. The ability to program, to pick up information, digest it and put it back out for the operating engineer to use is picking up by leads and bounds. One of the first symposiums that I organized was in 1958. It was when ASH, in '58 we were AE, it was in '55. At a laboratory in Cleveland and I was concerned about the control systems working together. They have different response times. Larger systems take longer to come up to a new level of output than smaller lighter things. And matching the equipment with the structure and the need of the structure, like Monday morning warm-up in the winter time. People come in - the building has to be warm. It's been cut back all of it.

M.K.

Would this be called system dynamics?

W.C.

System dynamics, right. And the point was brought out by a man who had been in ASHRAE a little longer than I, that later became a president , even if we had this research data what in the world would we do with it. And I admitted and we acknowledged that I really didn't know how we would digest it but I don't think that's particularly significant at the time, at this time because it's going to take us a long time to get all of these tangent characteristics together. And we're going to have to get the different manufactures to realize that system dynamics will be important to us. In the meantime we will find a way to use the data. Man has never has bundle of information and wasted it. Well I lost. I hadn't had enough committee experience. He was too clever for me. So nothing came of that meeting except the bill for the railroad. But later we were starting to gain on that, we were beginning to learn more about computers. And I established a task group while I was in office. I now had a little bit more influence than I did in 1958. So in 1977 I established a task force and it was on system dynamics, which is now a TC. It has grown to that. And it's an accepted fact. And we are progressing in this. But what this means, and what I feel will happen in the future, that instead of computers being an adjunct to a control loop and is feeding information back, we will use a technique that uses a horrible name. It's called Artificial Intelligence. And I think that knowledge engineering is another phrase to choose for it and I

can't understand how intelligence can be artificial but it's a phrase that people seem to recognize at least. The information can be picked up continually from literally hundreds of points throughout a structure. And as the trend from normal conditions to abnormal conditions develope this information can be fed in, and I'm not speaking of adaptive systems at all I'm speaking of true application of this knowledge. A solution to the problem will be presented to the operating engineer. When you think a minute if anybody is in charge of running something and a light comes on, a red light comes on, you have been trained in you can describe what it is you're supposed to do when this abnormality develops. If you can explain it and you are articulate, you can program it. If you can program it you can put it into the computer and it will do the same thing for you. And just as a computer can be trained to play chess. I'm probably getting a little bit too technical now but before we had computer control systems, and this was - Johnson put out its first system about 1960 – 61, somewhere in there. We wired things. If we wanted a thermostat to control a valve that was electric that we would run a wire to it if it was a pneumatic thermostat we ran a tube to it. And things were physically connected for a given design. And at the building changed and the functions changed, these hardwired things as we call them became an obstacle, inexpensive thing to change. We then learned later that if we could do this, then you can rewrite the program and reconstruct the control system as to the new environment it was to control or monitor, it was no longer hardwired you could do it was software, not wire, software. Well the same is true with artificial intelligence the building will react because anybody that is there will make the same diagnosis given the information. The difference is that it might take 1000 points of information and that will overwhelm the operating engineer and he can't handle it. This will be a problem. When I retired the cost of that kind of a system was prohibitive. And did not have a payback. It could be done and we would put up little systems in the lab to perform so we knew the process was correct but the marketability wasn't there because of the prohibitive cost. You aren't saving enough to justify such an expense. So in a sense we have to wait for it. The irony is though the man that won the argument in 1958, shoes on the other foot. We can now handle the data, we don't have enough data to plug-in. But there has been a lot of research, transient analysis dynamic response has been going on and we gained a tremendous amount of information. But I see that as a significantly different approach to the operation of a building.

M.K.

An important frontier.

W.C.

Right.

M.K.

The dynamic of the building itself.

W.C.

It's like night and day. Everything has been done in a static fashion. And just think for a minute, you're familiar with the comfort zone, we have the wet bulb and dry bulb temperatures, form sort of a rectangle on the psychometric chart. We have learned that the occupants can allow that temperature to drift about a degree an hour and really not recognize the fact, closer to 2° really but certainly a degree in hour, not realize that it's a little bit warmer now than when you first came into the room. You're just as comfortable because your body has adjusted to it. So it immediately comes to mind well the thing to do is to precool this little guy, this building, this room so that the people come in, at first it

might take them a few minutes to feel that it's a little bit too cool but there used to it and we'll let that thing drift through the zone and it will be one or two degrees outside of the comfort zone just about quitting time. Now there's no way that you could do that. You're literally adjusting that thermostat in that room every few minutes. It would be absurd. But we can do that with a computer type of a control system.

M.K.

It's going to be an exciting world. It is an exciting world. And I'm glad to be a part of it with you and to be a part of this opportunity to interview you Bill. Do you have any points you like to make before we close and if so?

W.C.

No I can't think of anything. I was relying on you to prime the pump as it were. We did a very good job of that Mike. It's been fun talking to you.

M.K.

Well I appreciate this opportunity. We are doing this as I mentioned to you as part of, just a preserve the heritage of the leaders of the society and the leaders of the industry and I thank you for taking time here in St. Louis to do that. I want to try to look up the Magic House and you might try to see the Museum of Transportation sometime here and will probably have a chance chat a little bit about it.

W.C.

I did see your Science Museum.

M.K.

It's a good museum. We've got several nice places like that in St. Louis. I think ASHRAE needs and deserves an equal place and maybe we'll get a chance to talk about that at a future date.

W.C.

Okay.

M.K.

Thank you very much, Bill Chapman. Appreciate you taking your time to do this.

W.C.

I enjoyed it very much Mike, I really did.