ASHRAE Leadership Recall (formerly Leadership Recalled)
Transcription

Interview of: Wilbert Stoecker

Date of Interview: June 1995

Interviewed by: Charlie Henck

Note: The interview ends abruptly – remainder of interview is missing.

Charlie Henck
Good afternoon. My name is Charlie Henck and I'm with the historical committee. Today we're here to conduct a leadership recall of Wilbert Stoecker. Mr. Stoecker is a fellow of ASHRAE. He has also received the F. Paul Anderson Award which is the highest technical award in ASHRAE. Good afternoon Mr. Stoecker.

Wilbert Stoecker
Good afternoon. Pleased to be here.

C.H.
Thank you, Will. I want to start off by having you give us a little background on yourself.

W.S.
I was born and raised in St Louis and at a time when vocational guidance was not a very active activity in the high schools and really the only vocational guidance that I received was from my music teacher, my piano teacher who said you could probably make a living in music but it would be hard. Why don't you think of something else like engineering. So that's never forgotten that advice and what marvelous advice it's been because I still continue music as an avocation but engineering is a great career to be in. So I studied at the University of Missouri at Rolla and then went on to University of Illinois to study for a master's degree and I was a teaching assistant at that time. And then left to work in industry on a research project to attempt to use coal as a fuel in gas turbines to drive locomotives. And at that facility after two weeks I knew I didn't like it. And then all the turmoil went through. Is engineering not for me, if I just changed jobs is it going to be the same sort of thing? And the only thing I could remember that I had done that I enjoyed in an engineering nature was when I was a teaching assistant at the University of Illinois so I contacted my department head there and I said, do you have any kind of positions and he said well as a matter of fact we have one in refrigeration. And I said fine, I'll take it. So that represents all the very careful study that brought me into the fields that ASHRAE are of interest to.

C.H.
Now while you are there is a graduate assistant in refrigeration you went on to pursue a PhD?

W.S.
That's right. I taught for a time as many other people did in that era without a doctorate degree but the handwriting was on the wall and the National Science Foundation recognized this because there were a number of us in that same situation. And they developed a program, a scholarship program to help support study for a Ph D. So I went to Purdue University and receive a Ph D and by the time I returned

to the University of Illinois the rules were very clear you had to have a Ph D in order to do anything at the university anymore. So my timing was very fortunate, pure dumb luck.

C.H.

Well that's great. What areas of refrigeration, you specialize in one area?

W.S.

Not really because I've done quite a bit in air conditioning as well, applications of refrigeration to air conditioning. But lately refrigeration activities have been more in industrial refrigeration which means primarily the refrigeration freezing of food, low temperature large systems. But in addition in the university we have the opportunity once in a while to take a sabbatical leave and it's looked upon some as a boondoggle vacation but it's also an opportunity to get away from what you're doing and think about a little more about the possibilities. And during one of those sabbaticals that I had, this was an opportunity to reflect on what was going on with respect to research at universities because by this time the manufacturers of components had developed some very sophisticated research facilities of their own and it became more difficult for universities to find their niche in that type of work. But an area that was not being well covered I felt was in the area of design and more advanced techniques in design. And my sabbatical was in, I spent it in Germany where they had the concept of design, a process design being much broader than just design, let's say of an air conditioning system. And when you look at an air conditioning system you think of the components. You've got fans, compressors. You've got fluids generally as a working substance and you're moving the things around. You have heat exchangers, reactors. And that combination of components covers a broad range of systems not only air conditioning and refrigeration but power generation and food processing, pharmaceuticals, all such things. So I began working in what eventually became called thermal systems. And we had some techniques that were starting to develop. System simulation, optimization of systems. And there's a tie in with what was going on in ASHRAE at the time too because in the late 60's there was the battle of the fuels going on between the gas industry and the electric industry. And when a new building was being designed, the electric and utility would come lay on the consultant or on the owner's desk a thick report showing that electricity would be the desirable choice and a few days later the gas industry would come in with similar reports. And the consulting engineer, as skilled as he might be, he was having difficulty trying to assess what was right, what is wrong in these reports. And the leaders of ASHRAE felt that they ought to have some kind of a role in trying to help the people, the owners but especially the engineers too to make a rational decision. So they formed a, what is called a task group on energy requirements for the heating and cooling of buildings. And I was asked to be chairman of that and I was intimidated by it and I declined because I could see the meetings that were going on where these various industries were getting their powerful people, their lawyers and I just knew that there was going to be a lot of struggle going on in this and I didn't feel that I had the maturity to handle that type of thing. The person who did agree to do it was a presidential member. Bob Tull and I became a member of that task group and it was a pleasure and an education to watch that person operate because he didn't know all of the technical details involved but he was responsible for getting these people to work together. And a master of administration because I could see what he was doing. He would ask me questions. He would ask the various people questions as though he were preparing to make a presentation to someone else. And he did such things as to call in addition to the meetings that were held during the national meetings of ASHRAE, to call meetings in between time which were really the working meetings which were away

from the political pressures of the group. And there was considerable progress made in that energy task group and as so often happens you think that well this is a nice little thing going on and then the energy crisis hit. So the timing was just remarkable because ASHRAE had some tools, had a database available to attack the energy crisis. And this whole activity went on with the formation of some technical committees and the entire series 90 standards are really the outgrowth of that work. So that's one of the things that has happened within ASHRAE that I was close enough to observe where I see there was some work going on that became very influential in what happened in an ASHRAE in the future.

C.H.

I have never heard that about the Standard 90. All that work that went on ahead of time.

W.S.

That's right and there's considerable work that had to go into Standard 90 of course but there was some background available that the writers of those standards had to rely on. I think of another situation that was much, much earlier. When I joined the University of Illinois there was an elder statesman whose name was Fahnestock, Morry Fahnestock who was a research professor at the university. And he had close contact with the medical school the University of Illinois. And when first, when air conditioning first became of some importance there were many people felt that it was a health hazard. The so-called thermal shock, that you're in an air conditioned place and then go out into a hot humid street that this would cause heart attacks and all such things as that. And Fahnestock was able to get the medical people to conduct some studies and to find that a normal healthy human being was not adversely affected by this change. Now I'm sure that air conditioning would have been popular without this medical background but it certainly had an influence to show that there was not a medical problem associated with air conditioning and then, oh I would say late 40's, late 50's air conditioning really started to become important and popular.

C.H.

Was this Fahnestock a member of ASHRAE?

W.S.

Oh yes, oh yes. And had the Distinguished Service award of ASHRAE. I think that he might not have been a fellow because I'm not sure that the fellow plan was in existence at the time that would have caught him on it, but he would he had all the qualifications to be one.

C.H.

Now you are involved in with the, was it the Illinois chapter or the Chicago chapter?

W.S.

The Chicago chapter. Living in Champagne Urbana the nearest chapter at the time. I became a member of ASHRAE in 1952 I think it was. It was in Chicago and I became a member of that chapter and of ASRE. I came into ASHRAE through the American Society Refrigerating Engineers. And that is one chapter that remained a refrigeration chapter in any city of the country. There's the Illinois chapter which is a much larger one with perhaps 800 members and the Chicago chapter that is considerably smaller, less than 100 members primarily devoted to refrigeration, industrial refrigeration. And that experience of the merger was difficult for some of the members who were members of ASRE because at that industry, the industrial refrigeration industry, was and is a well defined area. Everybody knows what the people do who are in that field and so when this group found themselves a part of a much larger arena in ASHRAE, there were some disillusioned because they had to explain to too many people what they were doing.

And there were people who dropped out of ASHRAE in the early stage because they felt that they ASHRAE had no interest in what they were doing. But a number of others continued and I think with a very successful result. There were the statements that people would make, ASHRAE does nothing for us. And whenever I would hear them I would say you're right. ASHRAE does nothing for you but ASHRAE is there, the structure is there and if you're willing to work there are things that can happen. And those people that remained and worked and now that issue I'm hopeful is dead. But there is considerable accomplishment that ASHRAE has been responsible for in that refrigeration area.

C.H.

Were you ever involved in any research in the ammonia refrigeration?

W.S.

Yes, in fact in the past dozen years I've probably done more in that area, ammonia refrigeration and which, in industrial refrigeration since ammonia is the dominant refrigerant in that field, I've gotten into ammonia refrigeration and some of the problems, some of the successes associated with it. Ammonia is an excellent refrigerant and in the sense the awareness of what CFC's can do, the ozone, depletion of the ozone layer and also global warming since there's been this attention focused on those problems. Ammonia comes off smelling like a rose because it does not contribute to those problems. So it's a good refrigerant. It is efficient, more efficient than any of the others. Has good heat transfer coefficients, has lots of advantages. Big disadvantage is the toxicity level that is considered dangerous of ammonia. It's the order of 25, 50 parts per million compared to the halocarbon refrigerants that are normally of about a thousand. So there are special things that have to be done to use ammonia properly but the equipment, the codes, the modern codes when they're adhered to, you have safe systems. And there should be no accidents. It's either human error or some kind of deficiency and a failure to abide by the codes that causes the accidents.

C.H.

Do you see ammonia refrigeration having a comeback commercially?

W.S.

Possibly. I would think that the first place that ammonia even right now is increasing its market is in the industrial field. Low temperature refrigeration of foods. The principle refrigerants competing in that market are refrigerant 22 and ammonia. Now 22 is an HCFC so it does not have to be phased out as quickly as the CFC's do but there is a time for refrigerant 22. Certainly no later than the year 2030 and most countries of the world including the United States have moved that time down. So refrigerant 22 will have to be replaced some way. And what has happened in the past several years is that ammonia has taken over more of the market in the industrial field than maybe the 50, 60 percent that it had. So it's moving into such markets more strongly now but into fields where it didn't exist before. There's discussion about supermarkets. Now if you use ammonia in a supermarket if you can't distribute it through the store. That is a violation of the code. You cannot have a direct system. You have to have an indirect system. So you've got to chill water or chill an antifreeze and send it through the coils in the display cases and that might look like a prohibitive disadvantage to ammonia but the fact is that that concept is, has virtue even if you are using a halo carbon refrigerant because in the leakage of refrigerant in supermarkets is considerable. And tests seem to indicate that within two to five years you have replaced the whole charge because of leaks in a system. Well when they, when refrigerant, when we didn't know about the CFC we get by with doing it. But now the cost of the replacements is so high,

maybe five, eight dollars a pound that it becomes an economical question. So regardless of what refrigerant you might want to use as the primary refrigerant, you might still want to consider the circulation of a fluid, an antifreeze through the store and if the supermarket industry has made that decision that we're going to use a secondary coolant, then ammonia can compete with the other refrigerants to provide the chiller. You have one central chiller perhaps on the roof that chills all of this fluid and you could use 134A for the higher temperatures or some of the replacements, the halocarbon replacements for 22 and 502 or ammonia.

C.H.

Interesting. Tell me about some of the research projects you've been involved in throughout your career?

W.S.

Well one of the early ones was in frost formation. We had a study at the University of Illinois where there was quite a bit of work going on in research residences in the 1940s, 50s, and up through the 1960s. There was a residence for hot water heat, hydraulic systems. There was a residence for warm and cool air cooling and while I had very little contact with the direct work in these residences, old staff members would get together. But another research residence that we operated for several years was on a heat pump, an air source heat pump. This was in 1951 and the heat pumps that were built at that time had problems and so many problems in fact that the heat pump industry almost took a nosedive and disappeared until better heat pumps, better compressors, stronger compressors and so forth were developed. Well one of the things I noticed in the research that we were doing on the heat pump is that the frosting of coils on the air source, on the outdoor coil was a problem. So we did some laboratory work later on frosting up of coils and this work had applicability not only to heat pumps but also into low temperature refrigeration because in cold storage warehouses there's always frosting occurs. And a few of the things that we found in that study had their influence on the kind of equipment that some of the manufacturers designed. For example to have a wider fin spacing at the entrance, the air entrance to the coil than at the outlet because most of the frost would form at that the entrance so you could operate the coil longer without defrosting. One of the areas that I worked with for some time was with controls, air conditioning controls. And this was just about at the time that computer control was coming on. So we looked at some of those modes of control that were improvements over the standard pneumatic controls which were primarily proportional controls but with computer control you could use proportional integral control or proportional integral derivative control although an air conditioning derivative control never seems to be necessary and sometimes it causes problems. We did some studies on proportional integral control and the possibilities of energy saving when you have this mode of control. Another area of research which was more in the software area was in system simulation which means predicting what a system is going to do when it's operating at part load conditions because normally components are selected to operate best at full load conditions. But systems operate most of the time at part load conditions. Well what sort of energy efficiency do you have at that case. Well with these tools system simulation you can predict when you know the performance of the characteristics of the components and when you know what the input conditions are, the outdoor temperature let's say, you can predict what the system is going to do. This was just about at the time when digital computers were coming in. And there was a conference that was held all summer long at the University of Michigan sponsored by the Ford Foundation and the National Science Foundation with a very artificial

objective of now that we've got these digital computers what are we going to do with them? So a group of faculty members came together and I was not part of that. I would have been honored to have been though but I think that they had, they really set a course and system simulation was one of the very important activities and this fit in with the system, the thermal system work that I was doing. So we got started in system simulation and it happened to be a very important thing then for ASHRAE in the energy requirements and considerable system simulation still goes on. Some of these big programs DOE2, BLAST. System simulation is a very big part of their activities. So you do some things in the narrow confines of your own job and you find that other people are doing the same thing and you get work together and there's a synergy that comes from it.

C.H.

You mentioned the Chicago chapter. Tell me a little bit about what offices you held in the Chicago chapter.

W.S.

I never held an office in the Chicago chapter although it seems that I presented, would make a presentation about once a year at the chapter and kept close contact with them. But about 14 years ago there was a chapter formed in our region of Illinois called the East Central Illinois chapter and the primary cities in that chapter are Champagne Urbana and the institutions or the University of Illinois, the construction engineering research lab of the U.S. Army is also in Champagne and they always have a number of people who are working in interests of ASHRAE. There's a small consulting community there in Danville Bohn Heat Transfer has provided a number of people and then in Decatur consulting people. So that's primarily the makeup of the chapter which has about 100 members and most of them are student members. We probably have about 50 members who are working full time in the profession and the Regional Chairman at the time was Phil Dugan who helped us get the chapter started. Jack Chaddock was the president at the time to install the chapter. Phil Duann saw me later and he said how's the chapter doing and I said well we're getting along. We have attendance, 25-30 at a meeting which is probably a pretty good percentage for this small number that is listed as membership. He said he's always been concerned whether that chapter would survive but it has in its own way and I think has done a lot for the people who are members of the chapter because the nearest chapters now are in Peoria and Chicago. So it has served its purpose well, have enough people attending meetings to make it worthwhile for people to come in from outside to speak, so it has served its purpose well. It's not a huge chapter and probably never will be.

C.H.

You mentioned the fact that you have a large student population or members of ASHRAE in your chapter. Can you tell us why you think there are that many students. Are they members or is there a student chapter.

W.S.

There's a student chapter at the University of Illinois and most of the students are in the department of mechanical industrial engineering which is usual. But also in the agriculture engineering curriculum because an active ASHRAE member is in the department of ag engineering and this has received support for research projects also. At the university there is the air conditioning and refrigeration center which is primarily financed by contributions from companies, 40 thousand dollars apiece and there are 16 companies. And there are approximately 40 graduate students who are working on these projects and

most of those students are student members of ASHRAE. So always at the local chapter of ASHRAE meetings there are student members there who are interested in the particular subject of the evening. So yes there's a good strong chapter which usually doesn't have student branch meetings of its own but has brought in and the dinner costs are subsidized by the central Illinois chapter of ASHRAE as well.

C.H.

Now all the students that you have there, the contributions that are made to this air conditioning institute, you mentioned the 16 firms that do that. Are they local firms or firms throughout the United States?

W.S.

No they're national firms and generally the larger ones. And because of the historical way this air conditioning, refrigeration center started they're primarily in the domestic refrigerator field and in the mobile air conditioner field. But the director Clark Pollard is working hard to expand that into building air conditioning and there are now four of the members in that area of activity. So we recognize that there's always going to be some attrition of these members so constantly we try to attract new members as well.

C.H.

What do you tell the students, do you still teach? I guess that's the question I should ask first.

W.S.

Well I should clarify that because I'm retired at the university. But the University of Illinois has always been good to me and continues to provide an office for me and I usually stop by for a short time every day if there's someone wants to talk or something, that scum up some messages, I take care of it. But I do not teach in the regular program now but I continue to teach in continuing education courses, primarily in industrial refrigeration workshops that we hold twice a year. We started at the University of Illinois and I thought probably we'll run this once or twice and anyone who is ever going to come will have come and then we'll kill it. But that didn't happen and in fact we couldn't handle everyone in one course a year so we hold one at the university in the summer and then in the winter move to Charlotte, North Carolina, hold another one. Now in the past five years we have not been holding them at the University of Illinois. After about 12 years of handling all the arrangements I was very happy for a colleague, Don Fenton at Kansas State to handle that. I still have my same role in the presentation but we hold our university offering at Kansas State and then a city offering at Charlotte. So that's a one week course and those are twice a year so I'm a part of that as well. But I do not teach classes anymore at the university.

C.H.

When you were teaching, what kind of advice would you have for a student trying to get involved in our industry?

W.S.

One of the programs that I had on an informal basis work very well. Chicago being a big design community I would contact the people as well as some of the manufacturers up there. Would you like to hire a student during the summer, normally between his junior and senior year. And those who were interested let me know and then I would let the students know, many of whom were from the Chicago area and was thereby able to get students placed there during the summer. And that had an advantage both for the student as well as the company. The company could see a student operating in a work

situation and be able to make a judgment that was much better than a half hour interview or one day interview. They could see how the student related to the other employees and how productive the person was, how the students could handle new problems that he was faced. It was good for the student because some of those students decided, you know, this is not the industry for me and it's really better to have had the student making that decision at a time when there was not as much financial investment and some others said I really want the industry, maybe another company and some would say I really want the industry and this company. So I would say that I've never tried to sell the industry.

Ed. Note: Tape ends at this point.