

JACK B. CHADDOCK

ASHRAE President 1981-82



Mike Carney: Good afternoon. My name is Mike Carney, and we're sitting here in the Adams Mark Hotel in beautiful St. Louis, Missouri. It's the 12th of June, and it's my privilege to this afternoon to interview Mr. Jack Chaddock, who is currently at Duke University. You told me that. And, you're now involved in, still in the Mechanical Engineering Department, where you were the head of the Mechanical Engineering Department, and now you've gotten involved as a Professor and Associate Dean for R&D.

Jack Chaddock: Associate Dean for research and development. That's a very fancy title for a fundraiser.

Mike Carney: Fundraiser, I see. Well, you get to talk to all the looking for resources for the School of Engineering. None of the people that really did well in the Mechanical Engineering Department, but all the good football players, basketball players.

Jack Chaddock: Were looking for money for the School of Engineering. We let the athletic department look out for themselves.

Mike Carney: All right, fine. Well, we're, here conducting this interview as part of our, uh, ASHRAE Historical Committee's work in interviewing leaders in society and folks that have been instrumental in the growth of not only the Society, but of the profession and the practice of refrigeration arts. And perhaps we should start with you telling us a little bit about how you personally, Jack Chaddock, got involved with the refrigeration and comfort-cooling arts and your innovation to the Society.

Jack Chaddock: Yes, I suppose like so many people, it was part good luck, part accident, and part by choice. I went to MIT to start graduate work in 1948 and was looking for a way to sponsor my research, studies and my graduate study there, and was offered a teaching assistantship in the Air Conditioning and Refrigeration Laboratory, so I accepted that, and that began, my activities there. The professor in charge of the laboratory then was Professor August Hessel-Schwert.

Mike Carney: Hessel Schwert? We worked on that name.

Jack Chaddock: Yes, we did. And he was very active in the Boston Section of the American Society of Refrigerating Engineers, and early on in my getting to know him and working in the laboratory, he introduced me then to the Boston Section, and I attended some of the meetings. And, subsequently, when I completed my master's degree there, I made a presentation on the work that I had done in capillary flow tubes, refrigerant flow and capillary tubes. That led to my becoming a little bit more active, and I went through the chairs of the Section there. And then also, I had the opportunity, in outlining my doctoral work, uh, to approach the American Society of Refrigerating Engineers, who had a small research program. In which they funded research in universities. It wasn't very big at that time, but it was nevertheless there. And so they agreed to help fund the research that I was going to do on heat transfer, condensation in the horizontal tube. And the man who then was the active person for ASRE on the society

level of administering that research program was Mr. Carlisle Ashley of the Carrier Corporation. Mr. Ashley subsequently was a president of ASRE. He was, uh, an associate of Willis H. Carrier in the Carrier Corporation, was a man, uh, who had a number of patents and a very fertile mind, and, in fact, is still living today in Manliet, New York, at the tender age of about 90 or so, and, still making comments on some of the things that ASHRAE does in its technical programs. A person I hope you'll have the opportunity to talk with some.

Mike Carney: Well, I certainly hope I have that opportunity also, sir.

Jack Chaddock: But Carl was one of these dynamic individuals and so interested in the field that he also obviously stimulated me to perhaps spend more time with that and. I had the opportunity then to go to, um, Finland as a lecturer in heating and ventilating technology on a Fulbright lectureship in the Finland Institute of Technology, and I did that in '55 and '56. And on my return then, presented my first paper at a national society, which was the result of my doctoral work on this condensation problem. And to my surprise it won the, annual award for the very best paper, and so I was awarded the Wolverine Diamond Key Award for the best paper in ASRE. And I suppose that also brought me some notoriety and attention to the people and got me more involved in society. And I think that's an important aspect from the standpoint of what the research that our society sponsors ultimately may do in attracting people into our society and they're becoming active in the things that they do.

Mike Carney: Yes, it's interesting the different backgrounds of the people that have been not only in this chair but have listened to the to the top chair in ASHRAE. And that's sort of a difficult thing to say because as you know probably better than most that there is no real top chair in ASHRAE. You really all sit around a round table and at some point, in time you are honored to be the president.

Jack Chaddock: That is correct. That is correct. It does give you an opportunity to exert a little more leadership in that position than you can in others, but it's a great honor to have that opportunity.

Mike Carney: It's interesting. You come from an academic path, and also a research path. That's very much a part of ASHRAE's purpose and posture in the field of our sciences. You mentioned Carl Ashley. Can you describe him as a person? Do you know much about him as a person?

Jack Chaddock: I've dealt with him quite a bit there. I've dealt with Carl quite a bit. Uh, subsequently, in 1966, when I was then at Purdue University, I took a year's leave of absence and worked for Carrier. In that activity had the opportunity to know him more. But the most important aspect of Carl and how I really learned what a fertile mind he had and how interested he was in furthering the aspects of the Society and so on, was after that first thing. We had a meeting in Murray Bay, Quebec, of the that was 1957 of the ASHVB Society. This was before the merger of the two Societies. And Carl had in mind that the society and the industry did not have adequate sound standards and was not doing an adequate job in the development of noise control and quieting equipment. And so at that time, I had spent some time with Bulk Morantic and Neumann, which was a new, emerging national firm and a leading firm in noise control, formed by an architect and an engineer and a physicist who put this firm together at MIT. And so, I had learned something about noise. And so at that meeting, there was this kind of bringing together of the genesis of a group which began to listen to Carl and decide that, yes, we had to do something about this. And there was Bill Kirka, who was then at the ASHVE laboratory in Cincinnati, who had done some work on duck sound noise. There was, uh, Warren Blazier, who was working for another firm. There was a fellow from the University of Michigan, whose name right now I can't recall, but was also doing sound

work there. And suddenly we began to coalesce this group of people who all of whom recognized the importance of better sound standards and better designed equipment from a sound standpoint. So, over the years then, from '57 to about '60, that group developed the generic sound standard for the society and was instrumental in seeing that the handbook the ASHRAE handbook chapter was completely rewritten to be brought up to date with modern, information on sound. And that involved going to laboratories and learning how to measure the sound power level of a piece of equipment. And we developed through a little fan company called ILG, a small fan without any scroll or housing on it, which was used as the standard. And we would stick this in a room, and it would run, and then you'd measure the sound level. And then we would send this piece of equipment to the next and a round robin and test this in various places and then put together the information. And ultimately, this building up of more and more understanding how to measure sound in a room, what kind of a room you needed it for, how sound power level was related to sound pressure level. Well, I'm getting too deep into the technology, but...

Mike Carney: I'm glad you did, because I always wondered where that little fan came from. It looked like such. Oh yes, and it was an Ilk fan. It was an Ilk fan, that's right. It was with a company called Swerdout. I believe Indiana, in Coke Bowl, Indiana, and in their sound testing laboratory, they had an Ilk fan as the standard, uh, I guess calibrated one, in a sense.

Jack Chaddock: But I think the incredible thing about this, here was a society which was the experts in noise and acoustics, which was the Acoustical Society of America. They did not have a sound power level standard for measuring power level standards, and it was developed in ASHRAE, and it was developed because of Carl Eichle's leadership and his bringing the rest of us into this and getting us sufficiently interested in developing the technical background and information and measurements to do that.

Mike Carney: That's interesting. And this was a group, and it wasn't necessarily all ASHRAE people.

Jack Chaddock: No, no. Some of the people were not ASHRAE members. They were people who simply who agreed to work with us and participate in doing this.

Mike Carney: Who paid you all for this effort?

Jack Chaddock: Nobody paid us. The usual ASHRAE, you know? No, we volunteered all our time for that. We met, I remember, many times on Saturdays and Sundays in airport hotels and motels and various laboratories where we would observe how the measurements were being made and trying to better understand how we would put the standard together.

Mike Carney: Over how many months or years?

Jack Chaddock: Oh, I think this, I think this must have occurred at least over two, two and a half years of rather intensive work that did this.

Mike Carney: And from that, you evidently, your account rewrote. It certainly wrote or rewrote the chapter on sound and the ASHRAE.

Jack Chaddock: Yes, actually Leo Baranek and his firm, Bolt Baranek and Newman, agreed at first to take on that task. And I assisted in that, as well as some of these other people who reviewed the things that he had put together and helped. And then, after he helped us get that a new chapter first time into, uh, really a modern form with the modern technology in there. Then after that, we took over the role and every few years revised it and brought it up to date as we learned more.

Mike Carney: It's an interesting process to create a standard and to get something in the guide.

Jack Chaddock: Yes, it was certainly eye-opening for me. It was the first time I had been involved in anything like that. And to see how a standard actually evolves and the enormous amount of work that goes into being sure that what you've done in that is repeatable is usable, and so forth. It was a great experience.

Mike Carney: Great experience. Well, um, now you were then a member of ASHRAE when you got into the...

Jack Chaddock: I was a member of ASRE, the American Society of Refrigerating Engineers. I was thinking about that time of joining the ASHBE, when in 1959 the merger of the two societies took place. And, of course, it was several very key people in leadership roles at that time who were able to bring that about. Cecil Mullen, probably the most dynamic individual who brought it about. Cecil Bolling, again, was the first president of the combined two societies, and at that time was president of Dunham Bush, Company in Connecticut. But Cecil Bolling and Art Hess and, Carl Ashley and a number of people who were the leaders at that time, were able and that's not always an easy thing to do to take two societies which had the background that ASRE and ASH and VE had, and all of the prestige and interest that had been developed in those societies up to that time, and say, "How do we now combine these?" And you had all these people who were in line to become officers and so on, and they worked out the details of that so that the officer line in each society would serve for six months during a transition period of about three years so that all those people would get in line. Walter Grant, who was another key person in that, and, and a carrier person, was also, so that was a dynamic time, too. '59, uh, when we made that merger and, uh, and proceeded then to become A-S-H-R-E, and ASHRAE.

Mike Carney: Thank you. Do you think we'll be the International Society in some way?

Jack Chaddock: Well, I you know, I think we are an international society, and the question really is whether we need to have that in the acronym, the title, or can we, uh, ASHRAE has become such a highly recognized kind of a name that one wonders whether we ought not to follow the line of, uh, PPG and TRW and U.S. Steel and so on, just let it be A-S-H-R-A-E. The international society or something.

Mike Carney: I'm glad that's a discussion I don't need to open up.

Jack Chaddock: I guess I won't try to solve that problem. I am pleased by the international aspects that the society has taken on and the leadership role it's exerting that way.

Mike Carney: It's warming to be part of, really, an international family, and you see it here. Even at I'm amazed and pleased that at our annual meeting, which is a meeting about how many people do we have here?

Jack Chaddock: Do we know? Well, I'm not sure at this I haven't heard anything at this meeting. Normally, at our society meetings, we have upwards of, 2,500 to 3,000 people, but I don't think it's that big here at Louisville because of the St. Louis. Excuse me at St. Louis because of this kind of shift that we made in the date of this time.

Mike Carney: I see. Well, uh, my thinking was it's on the order of 2,500 people. But it's an interesting number of folks from foreign lands and we've got, I know, two people from New Zealand, one in

Australia, and I saw the United Arab Emirates, and sat next to a fellow from Japan last night. It was, it's we've got a very, uh, strong international contingency to our society today. And it's not like they're visiting. They're active. They're very active. All right, um, um, you were president in '81 to '82.

Jack Chaddock: 1981 to '82, yes.

Mike Carney: Do you want to relay, first of all, the theme of your presidency? I know presidents are, President Butler picked the theme of volunteerism and do you recall a specific theme that either you announced or was part of that when you were

Jack Chaddock: Yes, You know, it's interesting, as you approach the presidency, you've done so many things in the society. I have been chairman of the program committee, chairman of the education committee, chairman of the research and technical committee, uh, served on a lot of TCs. You feel like you know a lot about the society, and then all of a sudden, when you're about to be thrust into this position of president, there's these things like what is your theme and how about the Presidential Award of Excellence and the point system and how you're gonna and why you'd seen all those things before, suddenly coming to grips with them and saying, "How will I do this in a way which will continue the quality kinds of leadership that the people before you have done?" I found that a real challenge. I thought about this question of what would be the theme of my presidency and so on, and, in the end, I came back to saying, What are you? What was I really interested in? What in the society had excited me most? And that was the technical contributions of the society. And so, I chose as the theme, Technical Leadership. That we needed to develop in ASHRAE the technical leaders that our industry, that our society, that this profession does. And made a part of the, Presidential Award of Excellence points down to the regional and chapter levels to attract people into our technical committee activities. The society, I think, mostly the technical information that it produces comes out of those 97 or 98 technical committees of the society, the TC structure. And here we have the experts on district heating, the experts on sound, the experts on refrigerant flow, the experts on air flow and ducts, and, you know, we have all this series of technical committees. And these need new blood all the time to be brought into 'em. And, uh, sometimes that simply happens by people doing it. But I thought maybe we could further stimulate the effort by getting it back down to the chapter levels and saying, "Have you got people in your chapter that are members of TC? If not, should they be? If they become members, then we will award you points for doing this, and we want to try to train, then, those people who will be the technical leaders." So that was the theme.

Mike Carney: That was the theme. I think it was a good theme, and I think you're hitting on something that I think is characteristic of the society, and it's a healthy characteristic. The emphasis on the grassroots. Your theme reached down to the grassroots. And ask people at the local level, "Are you contributing your tech in your technology at the national level on the technical committees?" And I think that was a marvelous thrust.

Jack Chaddock: Yes, well, it appealed to me.

Mike Carney: Well, you came from, you came from that. That's right. And that we need that in a society of profit and profit. You mentioned the number, and I, well...

Jack Chaddock: When I was president, I think the number was something like about 97, and I guess over the last 10 years, I haven't kept track of it.

Mike Carney: I think you're right. I think we're a little over a hundred now. I think it may be a little over a hundred technical committees. Which is just, when you say we're an umbrella society over a number of technologies, that gives someone an idea of, you know, we're talking a very broad reach at the scope of the technologies in our profession. And we know, you and I know that if you're on any one technical committee, how many things that one technical committee touches and covers.

Jack Chaddock: Well, it usually has a responsibility for some aspects of the handbooks, the chapters that are in the handbooks. It may have a responsibility for seeing whether a standard needs to be developed in that area or reviewed and revised. It needs to look at whether new research needs to be done in that area and prepare work statements for research that come out of it. And again, all those things that I'm saying are things that have evolved in the society as to the way we get things done. By taking those technical experts and those people who get a real interest in the society and saying, "Help us determine how we continue to get the technical expertise and how we get the technical output and the technology transfer of the society to where it can do the most good."

Mike Carney: You mentioned a while ago that you became really involved in ASHRAE at a time where we were getting involved with the Standard 90 *Energy Standards for Buildings*, and that was a politically charged.

Jack Chaddock: There were, there were three or four absolutely exciting things that were occurring about the time I became a member of the Board of Directors and then moved on up into becoming an officer and President of Society. And those things were, first, of course, the energy crisis, which had occurred in 1973, early '74. I came on the board in 1975. And at that time, we were just near the completion of the first draft of ASHRAE Standard 90 '75', which was, you know, it was a first. This was a situation not where there was a standard to test some piece of equipment or set forth a test procedure. This was reaching out and touching the entire fabric of the United States. We were talking about all the commercial and residential buildings in this country and what we needed to do in order to make them better energy conserving.

Mike Carney: Let me interrupt you just a moment, Jack. In your walk and my walk, I know what, "Standard 90" means. Yes, just explain the title of "Standard 90" or what the scope of what it was addressing as a standard.

Jack Chaddock: Well, it, the "Standard 90" was addressing the idea that, uh, our buildings had been essentially, designed without much consideration to how much energy they used. And during, I think, the, uh, the sixties and so on, when electricity prices were going down, down, down, because of very cheap energy, the amount of energy we were using in buildings was going up, up, up. We were building glass structures that had enormous heat loads on them. We were putting in lighting systems that had very high levels, sometimes without switches that you could even shut the lights off. We were doing a lot of things that rather ignored good energy practice. And the reason was simply because it was cheap energy and, so people didn't pay that much attention. And then suddenly, with that energy crisis, with the oil embargo, our attention was called to that. And now, the man I that I recall that we probably different people in the society who will have different aspects of who really maybe was the spearhead a lot of people were, but Rod Kirkwood, a consulting engineer out of Washington. The state of Washington, Seattle was then either the president or just leaving the presidency or going into it and saw the challenge associated with this. And really, he and another group of key people said, "Let's ASHRAE take a leadership now in this, and

let's develop a standard which will set forth guidelines for how buildings should be designed so as to not waste energy."

Mike Carney: And I'm sure as soon as the standard was published, everybody kind of said, "Boy, that's great," and, uh, said that ASHRAE did a real good job on that.

Jack Chaddock: I'm not so sure they did. I think there were, you know, there were obviously aspects of this which impeded very much on people. There was the question of insulation that had to be now put into buildings in order to meet certain envelope standards which were set forth. There were aspects of efficiency of equipment that maybe, in some cases, manufacturers may have difficulty meeting, or they didn't make a piece of equipment which meant that, and some other manufacturer did. So, I'm sure there must have been, we were able to do this first one and get it through practically without too much outside deterrence from our doing. In other words, we did not have people coming and saying, "You, ASHRAE, can't do that." When we started to revise that standard for the next round of 1980, we had the attention of the whole building industry and manufacturing industry, and that was a lot more difficult to do the next time around.

Mike Carney: Yes, yes, we were all, as a country, very eager to save energy, I think. We had a national mandate and a personal mandate to save energy. Yes, as soon as you put something down on paper and it becomes doctrine, then you have division.

Jack Chaddock: Yes, essentially, you've written down, good man of different opinions. Yeah, you've written down a prescription for how a building should go, and there's an awful lot of people who would like to decide about a building without that prescription.

Mike Carney: Sort of like, uh, agreeing that painting and art is good, but then as soon as you start to define on paper how painting and art should be accomplished, you probably would have a lot of artists that, want to talk to you about that.

Jack Chaddock: That's right. You'll probably recall that, that, about the time 90, '75 came out and so on, that the American Institute of Architects felt like they were being imposed upon by a group of engineers who were now going to tell them how to design buildings. The American Institute of Architects immediately developed a high-level activity to approach the federal government about developing a completely different approach to energy conservation of buildings. That approach being an approach which said that you would develop, not a prescription for how the building went together, not so much insulation here, not so much efficiency of equipment there, and so on, but rather a target, a number that you would design to, and that would still leave you all the flexibility that you wanted.

Mike Carney: Was that the BTUs per square foot concept?

Jack Chaddock: That was the concept of BTUs per square foot, that's right. And so, they were sufficiently convincing to the government that the government set up a very, very large scope of project, which the American Institute of Architects Research Corporation was given the contract to do and spent millions of dollars trying to develop that concept. And...

Mike Carney: How did they do?

Jack Chaddock: I think they developed a lot of very fine information, but I think in their zeal and their efforts to try to do this in a hurry and they left out a number of things that ultimately came back to haunt them and kept the thing from becoming. We called it BEPS, was the name, which was called Building Energy Performance Standards. BEPS. And BEPS is a name that those of us who lived through that era will long remember. I was at that time working, of course, with our society, and was about to approach the stage of becoming an officer, and so I was asked to take a look at this, and we did some studies on the info these people were producing information that said ASHRAE Standard 90 75' was nowhere near as good as what they were producing. And that, in fact, in our standard in some cases resulted in buildings using more energy and so on. And they were doing this through computer simulation programs. And we got the same computer program from the electric industry which had produced this, re-ran a number of the things that they had done and found large errors in the information that they were producing.

Mike Carney: I think it's interesting, and I think that's a good example, perhaps, of man of good will, and coming out of the same problem with an agreement that there is a problem, and trying to solve it with different perspectives, and coming to different conclusions. So, and that happens on every committee within ASHRAE, too. It's not necessarily a difference between AIA and ASHRAE. It's the nature of how we progress. As you look on the industry, the practice of the refrigeration and the comfort cooling arts, what kind of changes are you aware of that you kind of look on as milestones or as fundamental?

Jack Chaddock: Well, I think that the aspects of what we have done in, since '73 in terms of development of much better technology for improving the efficiency of equipment the applications of that and so on the milestones that I've seen there have been rather marvelous. The comfort areas, of course, are ones which ASHRAE has been involved with for years and years, and we have continued to research this and learn more and more about that. And that has led us also into aspects of indoor air quality, and when we went into the energy standard stuff, and we found that then we were beginning to impact upon how the building was ventilated. And that then led to the aspects of indoor air quality.

Mike Carney: Adversely, and we just we just approved the new ventilation standard. New ventilation standard, yes. Which upped the minimum, uh, three times. Yes. It went from 5 CFM per person to 15 CFM per person, which, particularly in terms of ASHRAE and our conservatism, is a gigantic, change in impact.

Jack Chaddock: But there's a very complex interrelationship between ventilation, the amount of air you put in the building, and the amount of energy to us. And because it's not so simple a thing to calculate, because you need relatively complex simulation programs to see that, there were arguments for a period of time about that. It looked like you could save a lot of energy by not bringing it, but there were other ways to do this, which perhaps the amount of energy required was not as great as you might have thought. And so, we could we could find compromises in this as we understood more of that interrelationship. And I think this is, again, a part of the society growing more and more basic in the things that it does.

Mike Carney: Jack, we were talking a little bit about the work and the evolution of ASHRAE, and we started talking about the energy standard for buildings, the Standard 90 series of energy standards for buildings, and how that drew a great deal of public attention to the work of ASHRAE, and how that standard affected the air quality in buildings, and now we have this term called indoor air quality that we address. Talk a little bit about that. You were right in the middle of that.

Jack Chaddock: Yes, this is one of these things that kind of is an outcome. When you do something new, sometimes you get an unexpected result. I suppose to some extent. We had always been aware of the fact that ASHRAE said that it was not just air conditioning buildings, that is to say that we were controlling the temperature and the humidity and so on, but that we were also creating a climate that was healthful and conducive to the best conditions for the people there. And a healthy climate obviously meant clean air, quality air. And so, as these ventilation requirements became minimized through 90 75', suddenly complaints began to appear in buildings that had not been there before. And complaints in a lot of new buildings which were built to new standards with low- or in buildings where by retrofit people had shut down on ventilation air intake. And so came about something now which we call the Sick Building Syndrome. So, again, here was an opportunity for ASHRAE to move in. There was some discussion at that time as to whether really this was a health aspect that ASHRAE ought not to be in. And we had people in the Society who had been interested in that and became then instrumental in attracting a whole new body of information. People began to come to Society meetings then who had never been interested in ASHRAE before because ASHRAE was now becoming a forum for the discussion of this problem. And it had present that different kinds of professionals who could make an impact on that problem. And so now we've sponsored annually this indoor air quality conference we've developed a position statement on indoor air quality, we and that, I think, is the kind of thing that is dynamic about ASHRAE. It does expand, it does get into new areas, and that's certainly one in which I think we've become quite a leader.

Mike Carney: Yes, we have, and I was intrigued. I met the recorder, a member of Barbara Rager's staff from Elcor, and Barbara heads up a, I should say Dr. Rager's staff. She heads up a very sophisticated team of, I want to say, scientists, engineers, and scientists who are defining what their quality needs to be for the digital equipment that telephone companies use to maintain our communications network in this country, and I can tell you for sure that Dr. Barbara T. Rader is on the leading edge of that technology, and now she has a member of her staff here in Arden. Which, as you say, it used to be we our participants came from consulting engineers, mechanical contractors, and the universities and what have you, and now here we have,

Jack Chaddock: It's a whole new kind of segment. And this again has been one which has received international attention. Probably in that area more than any other, we have an enormous international participation in that. People from Sweden, people from France, people from laboratories all over the world. Who are concerned about the quality of air in buildings and hadn't previously thought of this in terms of a society that was air conditioning and refrigeration as but now find that that isn't a wonderful forum for them to do this.

Mike Carney: Yes, yes, and I think we have a tradition of research that is very deep, and so when we add, when we focus on indoor air quality, we have a lot of previous research and documentation and standards and codes that we are not code so much but from which to draw and which to build. I think that's a healthy thing.

Jack Chaddock: Yes, and we have medical people involved in this, we have physiologists, we have psychologists, we have a variety of people that one wouldn't normally think of as being associated with an engineering society.

Mike Carney: That's true. So, it's a rich society.

Jack Chaddock: Yes, it is a rich society.

Mike Carney: Now when you were president there were a lot of changes going on in ASHRAE as a society. And, uh, you had mentioned during the break that...

Jack Chaddock: Yes, I had mentioned that, uh, there were several things that had begun to happen as I came on the board and then as I, moved toward becoming an officer in the society. The 90 75', the energy standards and what that promulgated, we've just talked about. Another thing that was coming to the fore at that time was because 90 75' created so much new attention and publicity from the Society. There was a great new in-thrust of members. There were people now who decided that they wanted to become a part of ASHRAE, and so our membership began to expand.

We had been for years headquartered in the United Engineering Building in New York City, as was the American Society of Mechanical Engineers, the Electrical Engineers, the Civil Engineers, and so on. It was one building with one amount of space, and we were running out of space. We needed a larger staff to handle our we had more throughput of information that was occurring, but we had no expansion space to go to. The question was what to do. And so as just as I was becoming an officer, we had set up a committee to look at the idea of, shall ASHRAE stay in New York?

If we stay in New York, where are we going to find a, or shall we move someplace else? The whole thought of leaving New York having been there so long, and Andy Boggs is our executive director who had been there so much and was thought of as a part thinking of moving our staff was almost unthinkable initially. Yeah, Andy, you know, you can imagine taking Andy out of New York, you know, that's a.. But in any event, uh, we did, and, and, uh, Richard Perry, who probably one of our past presidents that you will talk with, was a, was a member of that committee and was looking at that. And so, as I approached, uh, becoming a vice president, I was suddenly also, uh, thrust into the middle of this thing, and we began to then look at alternate sites, and we began to study criteria with respect to how we would judge that.

What did we need if we moved to another location? Of course, we needed a staff, a staff that would be supportive and happy. We needed a place that our members could get to easily, in and out. We needed a kind of an atmosphere within that society that would, that would work. And, and could this be done by taking us away from the New York? Well, of course, we moved to Atlanta. And, and we made that move during the year that I was president and dedicated the building in, in Atlanta. And I recall that time as one of real excitement that year. Now, we had a complete new, new headquarters location with an enormous amount of space that we can now expand into. We had been able to convince most of our key staff people, including Andy Boggs and Doris Flandorfer and Carl McPhee and others, to move with us and they weren't nearly as unhappy as they thought they were gonna be.

Mike Carney: Well, I would hope, having lived in Atlanta, that they experienced one spring in Atlanta that made them sort of if not forget about New York, at least not feel bad about it.

Jack Chaddock: I think that's right. I suddenly found that it was a lot better than maybe they had expected. And I think those, those warmer Atlanta winters also had some appeal.

Mike Carney: That's true. Atlanta, I think, has gotten most of the cows off the street and most of the, Civil War fighting behind them, and it's a nice city to live in, and I know that, uh, the society has been enriched, in my mind, with the, the move to Atlanta. I think in retrospect, we see it as a wise move, but it was a good move. I know the headquarters building in Atlanta, I don't know how, we're, we're. So, we're bursting at the seams in that building right now, are we not?

Jack Chaddock: I think we're not bursting in the seams. We have a lot of expansion space in that building. I think what the major drawback to the building now is, is that the HVAC system in it is kind of reaching the end of its period of good performance and so on. So, there are some renovations, I think, that need to be made. Now, of course, as soon as you get into that, the cost of renovation, that someone always obviously raises the question, "Well, should we renovate this building, or should we look at something new?" I believe there's still quite adequate space there and that was one of the real criteria when we made that move was to be sure that we did have enough space for that.

Mike Carney: Well, I guess, more appropriately, I should have said that the computing, the age of computers, has come even to ASHRAE. Yes. And I think that the systems that we use within the headquarters building are certainly going to be something we're going to be looking at.

Jack Chaddock: On a somewhat humorous note, too, with respect to that move, there was some discussion about whether we should buy land and build our own building. And then I can remember our laughing around the table as someone would say, "Well, now, if we do this, who's going to get the contract to do the HVAC of this building when we have a society like that?" And so, I think we decided it would be better to buy something already in place.

Mike Carney: The discretion was the better part of valor in that regard. The move to Atlanta now is behind us. But you were part of that you were very much part of that as president. Talk now about, uh, the policies involving research. We didn't start off on that. You've been very much involved with the research, not initialize your involvement in the society...

Jack Chaddock: I think this is another we probably overused the word "unique," but I think it's a unique feature of ASHRAE that we need to talk about considerably. Not hardly any other engineering society the size of ASHRAE has a research program that they sponsor. I had mentioned that I got started in the society through the fact that ASRE had a research program and helped to sponsor my research at MIT. As I worked my way up in the society and became a member of the Research and Technical Committee, which is the committee that looks at that program and keeps it going and sponsors research projects and tries to select the better ones through, looking at work statements from the TCs and proposals and what have you, that we were looking at a budget of \$150,000 to \$200,000 a year in the sixties when I was on that committee. Now, today, we're looking at a budget of over two million dollars for research, which shows what we have been able to do with respect to that. And I think that research program and what it has done in terms of Graduate students at universities being the benefactors of that research money, getting interested in the society as a result of having research money available, having professors who do this because they see the benefit of having some research funded through the society, a forum to present that research here where it is discussed and argued with. That's right, and absolutely and, some of the best people, the most knowledgeable people in that area there to hear what your results are and either pat you on the back or tell you didn't do it right or something else. But, anyway, that's I feel so strongly about that program, and I think our society has. There's never been a president whose come along or a member of our, I think, board who hasn't seen our research program as one of the jewels of the society and something that we want to do. And the Research Promotion Committee, which got created, was really to say, "Let's make even more out of this. Let's ask our membership to contribute to that program. And let's be sure that every penny that they contribute does go into research and not into something else." And Bill Collins, who was a president that was very instrumental in starting the research promotion activity and the research promotion committees and the fundraising that that effort has brought forth of over a million dollars from our membership, I think it's just yeah.

Mike Carney: I one of my I agree with you, Jack, that I think the research is a remarkable facet of ASHRAE's activities. And one of the things that has always intrigued me is the nature of the contributions to the research fund. Most fund drives, you get 80% of the funding out of the top five contributors. That's just a period across the board. ASHRAE is absolutely backwards. Almost all of the ASHRAE research funding is from little guys. Yes, it's gratuities. \$50, \$100, \$250 is a big contribution. And you say, "Well, what about the great big corporations?" That aren't very much contributors and part of ASHRAE. You know, just recently we got into a couple of \$10,000 donors, but only a few, and it's mainly the folks like you and I.

Jack Chaddock: That's right. We talked about that so many years ago, is how can we increase the funding, and should we go to the big companies, the Trane's, and the Carriers, and the Dunham Bushes, and the fan manufacturers, is that where and we would get small contributions from these people, but not large ones, and then this idea of going to the grassroots that Bill Collins had, and setting up a research promotion group, and so on, was the ideal, yeah, and the response to that, and of course, It makes me think, too, about the fact that Frank Bridgers, one of our presidents, was the man who had the original idea to create an award of excellence at the chapter level for achieving certain things. And so, the very first Presidential Award of Excellence was under Frank Bridgers of Albuquerque, New Mexico, who simply got the idea that he would like to have a little increase in membership in the society and he would like to be able to see us do a little bit more with our research program and so on. And so, the idea of awarding points to chapters and then making a fuss over them when they did a good job of it. And that has evolved since his time, with the Presidential Award of Excellence as probably becoming one of the most, greatest motivators for keeping our society moving forward and doing the thing that we've talked about here.

Mike Carney: Jack, we, you, I'm glad you brought up the point of the PAOE award and Frank Bridgers initiated that during his presidency. I know it was a driving force in my chapter in Nashville, and I think it continues to be an inspiration, of course, in each chapter. We've been chatting here for a while about your view of ASHRAE and, uh, your experience in the society and in the profession. Are there any points that you'd like to make in closing?

Jack Chaddock: Well, I suppose as I think back over the society that one of the things that I'd like to tell my students at Duke University as they're entering their careers is to think very strongly in terms of becoming an active in a professional engineering society. Whether it's ASHRAE, whether it's American Society of Mechanical Engineers, whether it's industrial engineers, whether it's the acoustic engineers, what have you, there is a kind of relationship, there is a maturing of your professional ability, there is a communication link there are so many things that come out of this, it's almost difficult for me to talk about them, but I do try to make this apparent to my students and I think equally, uh, where I'm working in some other field, I would try to make it known to my colleagues there or my, the people who work with me. There's just, uh, you had you said earlier something about, well, what did you get paid for doing that? I didn't get paid anything. And if I think of all the hours that I've spent for ASHRAE, all the weekends, Saturdays and Sundays, and other things I give up, I wouldn't do it over again for nothing. Because of what I've learned through that process, the people I've got to know, the perspective of I have of our soc- of the profession and of the technical areas that has resulted from that. It's a marvelous kind of thing that we have in America that really works.



Mike Carney: It really does work, doesn't it? I think we can truly say that, uh, ASHRAE is one of those little points of life that President Bush talked about, and I think it was sometimes even more than a little point. It's a bright light. I'm glad you're passing that on to your students, Jack, and I know you're a living example of just how beneficial and how valuable, voluntary contribution can be in one's life. Thank you for being here and being part of our life here this afternoon.