

ASHRAE Leadership Recall (formerly Leadership Recalled)
Transcription

Interview of: Richard Rooley

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Interviewed by: Rod Kirkwood

Rod Kirkwood

The next interview is with Richard Rooley. He was president with ASHRAE last year. And is the first president of the society we ever had from outside of North America. Mr. Rooley, as past president of the ASHRAE we would like to have your thoughts about the industry and ASHRAE and where you think the whole world is going as far as HVAC&R. Other than that, we don't hardly need anything.

Richard Rooley

That's the easy bit. Perhaps it is worth going right back into history. When I started life and the basis of why I came an engineer. I was born in England but left there within five months and moved to Scotland. So I went through my initial schooling in Scotland but as an Englishman. Then I went to university in Ireland where again I was an Englishman with a Scottish schooling studying engineering in Ireland. But it was very general engineering degree. And I met my wife at university there. We married soon after and now after 40 years of marriage we have two children. One is a project manager acting on behalf of a government client body overseeing construction of many buildings on their behalf. And my daughter's a HVAC engineer. Both married. Both have two children. Both of whom of course are exhibiting technical abilities which to the proud grandfather defines the fact that they will be engineers. My father was an engineer. He started in mechanical engineering, went over to HVAC. He was chief engineer for Scottish Industrial States during the war so he not only built the factories during the second World War but was responsible for the maintenance. And after the war he set up an engineering practice, consulting engineers. So engineering was in the family. I went through the, should I be an engineer, should I not be an engineer. Is the mere fact that I enjoy mathematics, I enjoy geometry, I enjoy logic. Despite that do I really want to be an engineer when my father's an engineer. But the interest was there, the passion was there, how things worked, how things hold together both in the geometrical sense but also in the mathematical sense. And in parallel with that I always had an interest in the arts and I always had interest in the church and the way, the purpose and defining the purpose of what we're doing. And I'm licensed to take services and preach in the Church of England. But only engineering after graduation I worked in manufacturing industry with a controls manufacturer. I worked with the local authority laying out roads and bridges, that type of work. And then came into the HVAC industry. My first real job in HVAC was in the firm my father was associated with but in a separate office. I was as far away from his influence as it was possible to be. And I'd like to look back and think that in fact I was in a different situation. I wasn't my father's apprentice or anything of that sort. I was quite separate. And learned the business of consulting engineering in Scotland working on many industrial projects, commercial projects and I carried on with that firm, DSSR through till about 1990 and I was a partner for 20 years

there when I left. While I was an engineer there I was responsible for the design and the management of the design process of many great variety of buildings, a great privilege to be able to work on Defense Department work, hospital work. Hospital work is a great educator of the engineer. You have to know your mechanical and electrical engineering. You have to know your systems. You have to know your politics of medicine. You have to know clean air. You have to know the way that a hospital hangs together. Clean rooms and the Department of the Ministry of Defense. Schools, technical colleges, universities, complex manufacturing processes, where we had to design to very close tolerances were very much part of my life. The way in which we work together with the architect and the builder was very important to me. And part of that goes back to the early days as an Englishman, school in Scotland, university in Ireland. I was always living at the gap between nations, between disciplines. So I think had an early, at an early stage forced to understand different people's perspectives. Be it an Englishman and a Scotsman, an architect and a builder. To live in an environment you have to listen and then you have to apply your skill to what you hear. So the way in which architects and engineers and builders and in Britain work together has become as important as the technology. There is always the vital need for technology. There's always the vital need for the way we use the technology. You can make the best possible product but if you can't bring that product to market in a way that the user can gain the benefit they wish from the product, you have failed. We cannot say, we're wonderful engineers because we design the best air conditioning systems. We can only say, we're the best engineers because we have taken an HVAC system put into a building that the customer, the user, be it the owner of the building or the young man or the young woman whose working in the building can use and feel comfortable and productive. So let's put that on one side. In the UK, I became involved in engineering societies and institutions probably from my 30's onwards or just before that. I involved with IHVE, Institution of Heating, Ventilating Engineers which is the, was then the sister society of ASHRAE. We were responsible for heating and ventilating and I chaired a number of committees there. And then became the Chartered Institution of Building Services Engineers where we're talking about all building services. Everything in a building that moves should be designed certainly by one consulting practice, installed one would hope by the contracting sympathy for the others and within a similar professional society. So I worked on the technical side and on the management of the institution. I chaired the papers committee for many years and I also got involved with a building services research association in the UK which is very similar to what was the original ASHRAE lab. It broke away, became the Building Services Research and Information Association in the UK. And we had a council there of the companies across the whole industry. And I chaired that council. And during one of our discussions, we were discussing the future. Where is the future of our industry? And I was very concerned at that time because I had also been on that time one of our government major committees looking at the construction industry at the criticism which our industry receives. At worst it was that the product we produced as an air conditioning system, there were three things wrong with it. Firstly it cost too much. Secondly it's delivered late and thirdly it doesn't work when you get it. And I kept hearing this. I kept hearing from government, I kept hearing it from hospitals and I was trying to grasp why. And it emerged in discussion with other groups that there was a disease which is a fuzzy edge disease. And the fuzzy edge disease really comes because you have the architect is an exceptionally good in the three dimensional drawing of a building. The structural engineer is extremely good at the three dimensional drawing of a building. The building services or HVAC engineer has exceptional skills in the flow of energy through pipes, the

flow of energy through walls, the transfer of heat through refrigeration or through heating systems. Each one is exceptionally good at what they do. But the interface among them is a severe problem. There is a fuzzy edge disease that each of them has great difficulty in communicating one with another. And that really guided a lot of my thinking as I came into my presidential year in as much that we are a community as a community in the construction industry. Of architect, mechanical engineer, electrical engineer, cost controls, structural engineer, the builders, the sub contractors, manufacturers. This is a community. And if we work in our isolated bits, unfortunately we are unable to assemble a building which is what our client requires. His own men will work together in a very positive cooperation that we can achieve the buildings we need. If we are going to work towards assembling a building that provides our clients' needs, we must first learn those client's needs. We must obtain a good brief. We must do a good design in cooperation with our colleagues across the whole industry. We must specify, cost it, draw it, calculate it, and then build it. And above all we must then be able to operate it and maintain it. So our problem is across the industry from architect to consulting engineer to contractor who are working together to produce a building but also lengthways through the program from the client's brief to the design, to the construction, to the operation and maintenance. We have to have the whole together. Using that as a bit of a foundation of course in the run up to the presidency and talking as I did and as all presidential members do they remember the pleasure of talking around the country, around the world to engineers in all parts of the world, at all disciplines or prejudices and intents. You begin to, from my perspective was looking as to how I could address the fuzzy edge disease head on. One very interesting conversation I had in a large architectural consultant design office, I was sitting in a room with probably 20 designers. All extremely competent designers. And I asked them how much time in your week do you spend using ASHRAE material. Our Guides, our Handbooks, and our Standards. The reply was half a day a week which I doubled because I couldn't believe that the technical design engineer only spent half a day a week on technical matters. So we concluded one day a week. And what do you do for the other four days? Well I manage, I talk to architects, I talk to structural engineers, I do cost control, I redesign probably three times. Most buildings seem to be redesigned about three times by the designer. I try to get the CAD system to work as it should. I try to interpret what other people are talking about. I write specifications. I visit sites and I make the system work. So I said to them, how are you educated and trained for one day a week? How do you learn how to be, do the engineering part of your work? They said well I went to university for four years. I spent a further three years to obtain my professional engineer status. I then regularly attend ASHRAE meetings where we discuss technical matters. And I'm therefore very good as an engineer. For one day a week. So I then said to him, how did you learn how to do the four days a week? There's always a pause at that moment because I've asked this question in many other companies having gotten one answer. I've asked it time and time and time again in many countries, not just America. And the answer is well I learned all the other stuff on the job. I pick it up from my boss. I learn it by the hard knocks of experience. I then turn to the employer and say, do you make your profit and loss from the one day a week or from the four days a week? The one day of technology or the four days of management, leadership, interaction, communication. And all the profit loss of course is made in the four days not in the one day. This led me to the sort of thinking that firstly we must assume the highest quality of excellence in technology, that one day, must be based on excellent well researched, well presented, well documented, and well proved technology, not theoretical but proved technology. That is our starting

point. Our foundation of everything we do is that one day which must be excellent. But we must also educate and train our young people and our older people in the four days, the soft side of ASHRAE. Now one of the things I'm probably quite pleased about in doing ASHRAE is I started originally a task group and then became a TC on, originally it was general legal education and then it became general management organization and legal education. We all started to run seminars attached to meetings. And for several years in succession the highest attended seminars at ASHRAE meetings were on this general management and legal education. It was a big step for ASHRAE to take and the EXCOM and the Board discussed it in great depth as to whether we should as a society tackle these communication problems, the delivery mechanisms. The traditional ASHRAE approach has probably been, we're engineers, we're scientists, we are the ones who produce the best guidance. It's for others to deal with the delivery mechanism. In truth if you can't deliver, there is no purpose in having good technology. Good technology is only good technology when it has been delivered and is in use. So we started the task group on general legal education, or as I say, management is included and it's still very well attended. There's a great hunger among the ASHRAE membership for that. I think we'll have to do a lot more in this area, the communication, the fuzzy edge. Just one little example which I often use is that engineers I've spoken to for many years have said, one of the big problems is the client doesn't give us a brief. The client's duty is to tell the engineer what he requires. But the engineer's duty is to extract from the client what the client really needs. So if the engineer labors under the ice and misapprehension that the client can tell him what the client wants, the engineer is in error. It is to the engineer to get out of the client what he needs. That is part of his skill. It is a soft skill. One of the four days a week job. But he can't possibly start his one day technology until he knows what he's going to do. Now does this apply to what ASHRAE does itself? I think it does. If we go back to the original Standard 90, I believe that, others will perhaps correct me, that Standard 90 emerged because of society's need. Society had a need for a standard in the area of energy. I believe that that group who wrote that standard ascertained in what form and how it should be presented to society. It then went and put the technology that was required into a language that could be used by bodies outside. And that was a very successful standard and established ASHRAE in its position. But it was delivering a product, a standard, which the client needed. And we really must examine everything we do in ASHRAE. Not only developing inside ASHRAE what we must do but also developing the way in which we deliver what we need. Does the client really need that? Do the codes officials need it in that form or that form. Anyways perhaps slipping slightly sideways, Internationalism has been an important part of my life in ASHRAE. I am after all an Englishman who became the first non-American or the first person not from North America to become president. I have to say why. Why would ASHRAE elect someone to that position. Perhaps ASHRAE had reached the stage, and as always the time and the man come together, that perhaps the American society was realizing that engineers in America don't just stand alone. America is still the biggest market. I believe that America still has some of the strong, best engineers in the world. It has many engineers. But it is not unique. There are excellent engineers. There are marvelous buildings being built elsewhere in the world. There are, in each part of the world a different approach to engineering. A different approach to construction. Different ethics in the approach to the construction process. So ASHRAE had on the Board a number of non-American members of the Board. I came on to the Board as the first non-American board member in the early 80's and we had international people on our TCs. We were beginning to understand as ASHRAE the need to bring a little

bit of yeast into the bread of ASHRAE from outside. And this group of probably, at any meeting there are could be two or three engineers from around the world are present. Attending possibly more. Many of them with great technical expertise. Many of them responsible for major projects worldwide. And it just so happened that I was an English speaking engineer from overseas and I tried, I worked very hard to understand the way Americans do things. Because if we come to ASHRAE it's important to acknowledge the leadership of ASHRAE, not just divert from it. ASHRAE is a very powerful society. It has over 50 thousand members. It has a very strong home market. It writes standards for that home market. It has many buildings which drive the need for technical committees to write handbooks for design. It has a culture, a philosophy, a tradition which is unique I think anywhere in the world as ASHRAE is. It's lively, youthful, rolling development organization which steadily improves, constantly improves. And it therefore was right that this growing society should take account of what was in the rest of the world and it has. Presidents visit societies all the way around the world. We have societies from, engineering societies worldwide come to the ASHRAE meeting. We have an ASHRAE alliance of associate societies. They all come to the winter meeting. We are enriched by this international input as are the other countries enriched by ASHRAE. Everything is two way. You receive and you give on an equal basis of giving and receiving. And I can go to a TC and listening to someone for India or Pakistan or Australia contributing to a discussion bringing a unique input. So ASHRAE is an international society but it is in American society. It is local. It is strong because it is American. It gains more strength by having input and putting information out to the world. So a delicate balance and a good balance. And incidentally a great joy and this is being recorded at the winter meeting in Orlando. I just have the pleasure of watching the Indian and Pakistani lead engineers in their respective parts of their societies sitting together at the Board and then standing up and holding one another's hands. This was marvelous because ASHRAE has now become internationally across borders. And they talked to one another. I have a lovely photograph again with these two same gentleman while I was still president at a banquet. Both of them in their own national dress with me in the center. An Indian and Pakistani shaking hands at a time when the governments of their nations were not talking to one another. So we had this wonderful situation where ASHRAE was crossing borders. So it crosses borders nationally. It crosses borders within our industry. It crosses borders through the projects. We bring, we enrich each part of the society from other parts the society. No part of what we do in our lives is unique unto itself. Digressing a little bit. Two health things struck me in the last couple of years. Firstly I had a grandson who was born with hemophilia and there were two lessons from that. He was born during an ASHRAE meeting. And it was the hemophilia showed itself during birth. It was dramatic. The surgeons themselves actually threw the textbooks away because they had never seen anything like it. And they had to start from scratch. There were two lessons that came out of that or let's say two things about ASHRAE. Firstly the sympathy, the love that was shown to me. Prayer letters were across the world. And there was a great deal of love all around me, personally for that. So we truly did have a community of ASHRAE. Secondly, sitting in the PREM baby unit, which is in fact the intensive care unit where all the other babies were tiny but our grandson was a good size baby. Nearly everything I saw in that room depended on our industry. The refrigeration. The quality of the air. The drugs of course stored, part of the refrigeration. The comfort. Everything in that room could not have existed without us. And that was very important. The second thing, during my year I develop a bowel cancer which had to be removed. And then I was given the chemotherapy that went with it. Again two things I learned from it.

Firstly the community, the support which I personally had. And I'm not just talking about in America or in Britain. It's very humbling when you know there are churches and synagogues and mosques praying for you and, not to be religious, thinking of you. Just holding you in their thoughts and I could feel that when I was going down to surgery. And I knew that ASHRAE was thinking about me. Great strength and I've seen that through the chapters of ASHRAE. I've seen the way that if someone gets into physical or indeed financial or marital problems the chapter seems to close around them and give this wonderful support. Not handouts. Just to be with, to walk, to hold someone's hand. This is vital. So that was I think an important lesson to me about the fact that we are engineers but we are human beings. We have this humanity that is around us. And of course you go into surgery and various theaters be it through for investigation or for the surgery itself or afterward they all depend on us. In a hospital the hospital is in fact a building services and equipment surrounded by a fabric to keep the weather out here. Lying in a hospital bed, everything about us, everything there is designed by us. My big regret when there and almost any building I go to is this separation of design and operation. Back in the 1980's I concluded and many of my mentors at that time agreed with me that maintenance engineers would not learn how buildings were designed. There was no training for the maintenance engineer and the operations person, facilities manager in the design. So I abandoned any hope that we could educate facilities managers or operations people in design elements. In 1980 no one was doing it. During my presidential year or prior to my presidential, I always worked on the basis that one of the most important things we should do as members of ASHRAE was to educate our designers to design buildings which could be operated and maintained. Because of two reasons I've abandoned that. First reason, I've done a lot of expert witness work. I've reviewed projects. And secondly I have spoken to engineers worldwide and to client's worldwide. So midway through my presidential year I abandoned, in my own thinking, any possibility that designers could be educated to design buildings for operational maintenance. So during my second half of my presidency, every time I spoke at a chapter meeting or a sister society meeting or in any group, and I've done this in America, UK, Europe, Far East, Middle East, Australia, I have made the statement that there are no design companies who design buildings with an eye to maintenance and there are no companies educating their engineers and training their engineers to understand operation maintenance. I've made the statement in a way that invites retaliation, that invites disagreement. I have provoked disagreement. Nowhere in the world has any company or any design engineer contradicted my statement. The heads are nodding not shaking. I therefore have to deduce that by virtue that no one has disagreed with me, that our industry agrees with me, that our industry and ASHRAE is in agreement. That we cannot educate designers to design buildings with a view to operation and maintenance. So we're at a position. The designers are not designing for operation and maintenance. Operational and maintenance people aren't understanding design. This leads me very clearly to the conclusion as I said right at the beginning that the only three things wrong with our industry, in fact now four things wrong with our industry. The first that it costs too much. Second that it is delivered late. Third that doesn't work. And the fourth one now is it can't be operated and maintained. So what do we do about it? ASHRAE does talk about these things. I have talked much about standardization and the ways in which we can bridge design and operation. The human skills are not there but I've come across a number of bright lights in the tunnel. I'm coming across manufacturers of air conditioning systems who will deliver an air conditioning system with standard components, standard controls guaranteed for five years. In particular the ones I've really come across are under

floor air conditioning where you can do that. I've come across some approaches in other forms of air conditioning which are standard. I've come across a small number of clients who are demanding that design is appropriate for operation. And they're, one hospital, one who is responsible for commissioning or rather for giving the orders to people to build hospitals and projecting hospitals on behalf of the Department of Health in Britain told me a story how he, before he signs off the architectural roof drawing he requires the man who will actually fit the roof to agree the drawing. So the client is beginning to set the standards. It's a tremendous uphill battle because our industry is divided into those who procure buildings and those who use them. Nearly every school district in America, you have the client department who procure the building and a separate department who operate and maintain. There is separation in everything we do. As long as that separation continues I think we're going to continue to have this terrible problem of delivery. Changes are happening. In Britain we're having what are called partnerships where the government goes into partnership with industry to procure and operate for 20 years a hospital. It's in its early stages. I see one particular case where a major contractor has purchased one of our largest developers in the UK. So the contractor is now actually becoming the developer and will apply business skills as well as technical skills to the procurement of commercial space. Developments are happening and I have hope that we will, ASHRAE has to change. ASHRAE, I think our engineers, and here this is, I have the odd heresies, that our industry is a very low tech industry using high technology products. Our assembly process is one of management and tying things together and understanding technology at a level of the interfaces. But we use components which are at a very high technological, highly researched level. So we acquire within ASHRAE firstly to understand that we are all not high tech people. We have human skills as well as the narrow technology. You don't need to have a first class honors degree, PhD and so on to understand technology because the use of technology is a simple, relatively simple activity. But our components must be researched, designed, and constructed to be robust and to have the best technology. An example which drives me in this, I have friends who are directors of Rolls Royce aero engines. In the old days they used to sell an aero engine about 20 million dollars approximate cost of an aero engine. They sell that engine at no profit and they make all their money out of maintenance and operation and spares. Three things happened. One, they took hold of reliability center maintenance or FMA, functional maintenance and functional design and reliability maintenance techniques which analyze a buildings or an engine's design for maintenance. They brought in simulation and diagnostics. About five years ago Rolls Royce were producing engines and suddenly there was no maintenance required and no spares. So they were trying to sell an engine at cost price. They had lost their profit on operational maintenance. So all aero engines are now leased by the hour. The manufacturer has the confidence that an engine will run. We're miles away from that in ASHRAE and in HVAC&R. There is one contractor in Mexico who I have met who offers that. He strips the controls off everything so he has the same controls on every building he operates. But he leases the air conditioning system to the client. Steps like this are happening and I have great hope for the future. I think we have the most wonderful people in ASHRAE. I've talked about their humanity. I've talked about their technical excellence. I've talked about our importance as one of, we couldn't live in America without air conditioning or refrigeration. We are in a key position. We are well respected throughout the world, throughout government, throughout client bodies. We are respected for our technology. In some areas we are respected for our ability to deliver. Our consulting engineers throughout the land and our contractors' don't have the

respect I would like to see. The best of them are respected. The best of them deliver buildings that can be maintained. I overstated. I think some many consulting engineers, I shouldn't say consulting, design engineers be they working for contractor, consultant or client are designed buildings that can be operated. Of course they are. The best of them are doing well. I have a fear, it's not a fear. I have an anticipation that many of those who are below standard will disappear. There is for example in the town I come from when I worked in a factory the machine setter was king. The person who worked the large capstan lathe and even set up that machine to one or two thousandth tolerance. He was king. Every factory in that particular town had a group of machines setters from the low tolerance to the broader tolerance. Within a year or two they disappeared as a profession because the computers were setting the lathes. So you had a whole group of highly competent, highly expert applied technologists, technicians I should say, who were out of work because of the change. If we're not very careful that could happen to a lot of what we do. For goodness sake all we're doing is assembling some pipes and ducts and a few heat and cool transmitters into a building. A good computer could do it better than, no I shouldn't say that. A good computer controlled by a master designer will do wonderful things. What are our people going to do in the next ten years? They're not going to do what they've been doing for the last ten years. Or industry is changing. Somehow or other we have to change our skills. I think we're doing quite well at it. I think that we've broadened our views and I think we have excellent leadership and I look forward to the next ten years to see some wonderful things happening. Now what have I missed out?

R.K.

I don't think you missed anything. I think we've probably pretty well wound it up. Is there anything more that you'd like to add we'd be happy to add it.

R.R.

I don't think so. I think I'm sufficiently optimistic in what I've been saying. I think we have, I am optimistic. I'm optimistic at the two ends. I optimistic about the young people coming in. When I go into the student breakfast and see the vitality of those young people. And they're not all just narrow engineers. They are broad people. I'm also impressed by the mentality of our older people. We have a tremendous resource which is our older people. They keep involved. They are people of great wisdom. They're great mentors. They're not necessarily listened to but that doesn't matter what they say does, is in fact absorbed. Just as an example, during my presidential address I talked quite a lot about standard, or during the year ad president I talked as I said about this division of design and operation and the need to integrate the two and the need for standardization, prefabrication, and so on. So at the end of my presidential year that I read a paper which my father had written in 1963. And this was presidential paper to IHVE, presidential address to IHVE, the sister society of ASHRAE in the UK. And here it said if we don't train our designers and our craftsman together our industry will go into decline. If we do not understand that if we are designing remotely from a site, we must designed it in such a way that it can be operated in a pre-fabricated way that the craftsman can understand. If we don't understand this geography and process then our industry will decline. I was saying similar things maybe 40 years later. In some ways he was right. In some ways he was wrong. We are surviving. But we have not developed as fast as we talked up. We can do better. We must always do better. And I hope, well I'm going to be in the mid 60s now, I hope to goodness that I can keep good as long as those who are nearly 90. And

keep watching with joy at what's happening and not only by our very young but also the tremendous resource of our older people.

R.K.

I think that's a very excellent interview of what the Society and our industry needs to look forward to and how to solves those problems. And how they make it work altogether.

R.R.

Yep. That's it. Wonderful people

R.K.

Thank you very much.

R.R.

Thank you.