

MEMOIR OF JAMES C. HOWLAND

CH2M HILL

Interviewed 1982-83

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INTRODUCTION



Jim Howland

James Howland, "Jim" as most people know him, was born in 1916 in Oregon City, Oregon, where he spent most of his early years. His father was an adventurous man, having come west from New England to go into placer mining in Oregon. He subsequently traveled to Sumatra where he was also involved in mineral extraction. At the time of Jim's birth, the family was located in Oregon City where his father owned a real estate and insurance business. His mother served as a volunteer in various community activities and was particularly active in church concerns. She also had a proclivity for art, an interest that she conveyed to her son.

Jim's parents were very influential in shaping his values. He described his parents: "Both Mother and Father had a high sense of duty and consistency... and a sense of keeping their word. If they said they'd do something, they really would do everything they could to do it." Other people who had an influence on him were his aunt and uncle with whom he spent much time. "My uncle had a very strong kind of moral commitment and was always very well-liked by people." Both his father and uncle operated their own businesses. Jim was to follow in their footsteps in later years.

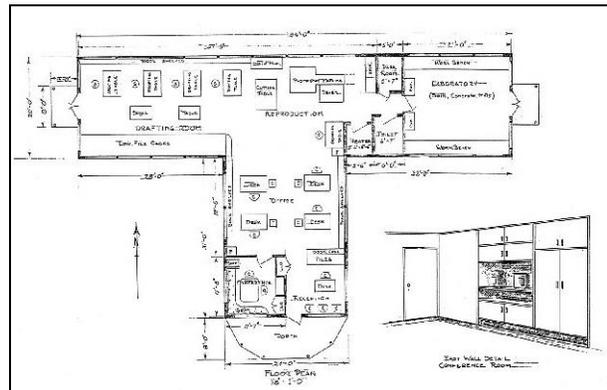
An interest in water coupled with a bent toward mathematics and science led Jim to enroll at Oregon State College in 1934. His field of interest was civil engineering with a special emphasis on hydraulics. It was during the college years that he met his future partners in CH2M. Holly Cornell and Burke Hayes were fellow students; Fred Merryfield, an engineering professor, was the one who drew the four men together. "Fred planted the seeds when we were in school, and he kept in touch with us when we were graduated."

Fred's support, and other influences, prompted Jim to continue his education by enrolling in MIT, where he was awarded a graduate fellowship. During this period, Jim's professional interests shifted from hydraulics to soil mechanics, a field that seemed to have more opportunities. He continued his interest in starting an engineering business; Burke Hayes, who was also at MIT, discussed the idea with him many times. He was also in contact with Holly Cornell, who was studying at that time at Yale University. It was while Howland was in graduate school that he met his future wife, a Radcliffe student named Ruth Meisenhelder. They were married in 1941.

In 1939, after finishing graduate school, Jim accepted a job with Standard Oil Company of California. He designed and supervised construction of

refinery facilities. Many companies separate the various parts of a project and assign different individuals to each. Thus, it is difficult to get a perspective on the whole project. Jim's experience at Standard Oil of being allowed to follow the work from the beginning to the conclusion proved to be an effective approach. "I think that's one of the reasons that, to this day, we have project managers on a job follow it all the way through till completion."

In 1941, Howland began active duty in the U. S. Army Corps of Engineers in which he served first in Hawaii and then in Saipan. He gained experience in the construction of airfields, roads, and harbors as well as more general planning and designing of large-scale projects. His service during the War was recognized as meritorious, through the granting of the Legion of Merit and the Bronze Star. At the War's end, he was still interested in launching his own business endeavor. He had continued correspondence with the men who were to be future principals in Cornell, Howland, Hayes and Merryfield. They planned to come together in Corvallis as soon as possible. While stationed on Saipan, Jim had even drawn up plans for the future company complex, complete with members' homes, orchards, a pond, and other developments. In 1946, the dream of an entrepreneurial partnership became a reality when Cornell, Howland, Hayes and Merryfield finally came together in an engineering business.



Jim's early vision of their future office.

The primary focus of the original interviews (March 17, 1982; April 13, 1982; May 6 and 11, 1982; and April 22 and 25, 1983) was on Howland's reflections about the development of CH2M HILL. He discussed the contributions of Cornell, Hayes, Merryfield, Archie Rice, Ralph Roderick, and Clair A. Hill; the critical decisions that shaped CH2M HILL and his own role in its development. He became General Manager of the firm almost from the beginning. He reflected on this role: "I guess about every year I offered to (step down as general manager) and every year they said: 'Well, why don't you do it for another year.'" He was General Manager, then President from 1947 through 1974 when he resigned the position. Then he was Chairman of the Board and Director of Operations from 1974 to 1978. He worked on a major project in San Diego for a year and then returned to Corvallis as Personnel Director until he retired in 1982. Then, for years to come, Jim remained engaged with the firm by sharing its culture and history with new generations of employees.

He reflected on his management duties while chief executive: "I saw my role as a manager as sort of like holding together a bunch of balloons and seeing

that they all went up together.” He further elaborated on his management style:

...if you kind of keep most everybody advised and you bring everybody into the decision making and let everybody share the rewards, why then you don't have much of any management problems. They solve themselves. You aren't really controlling people.

Howland discussed some of his personal qualities such as his fiscally conservative philosophy, moral commitment to honesty and forthrightness, and optimism and upbeat attitude about life: “I think being careful not to get too serious about everything was maybe a contribution that I could make.” His personality and influence as overall manager of CH2M HILL caused one principal to remark: “If Holly is the brains of CH2M HILL, then Jim is the soul of CH2M HILL.”

James Howland retired in 1982, but he continued to lead a busy personal and professional life until his death in 2008.

[Editor's note: The following is a summary of Jim Howland's original memoir. The summary focuses on key events and issues that impacted CH2M HILL's history as recalled by Jim.]

EARLY LIFE AND EDUCATION

I know you're from Oregon City. Were you born there?

Yes. I was born in Oregon City and my mother was born there ahead of me.

And what year were you born?

I was born June 2, 1916.

Did you ever consider forestry as a vocation?

No, not really. But I think that's what got me into engineering. I thought that it would be nice to work outside. I thought engineers got out and measured the flow of the stream and, you know, did surveying. I remember one of the early issues of *Boy's Life* magazine—that was the Boy Scout magazine; believe it is still published. Why, it had a very good story about how these boys built this dam at the scout camp and all the problems they had with boring the holes to see if the foundation was good. They did it all pretty much by hand. And then they had problems. I don't remember what. You know, they always have to have some big problem they solve. But I remember being tremendously intrigued with that.

When did you first consider engineering as a vocation?

Oh, I think the later part of high school days. At one time I thought I'd kind of like to be a farmer. I don't know why, but I can remember that. But it just seemed like, gee, maybe I'd fit in engineering. I seemed to get along all right in math and I seemed to get along all right in science. I thought that engineering would take you outdoors a lot and I liked the outdoors and I liked things to do with water. We used to build little waterwheels out of tin cans and things. And so it just seemed like a logical thing for me.

And why did you go to Oregon State College, OSC then?

Well, gee, this was the only engineering school in the state.

And you wanted to stay in the state?

Well, it was the economic thing. That's just about as far as I could get and pay for. I never really thought of going any other place. We used to come to Oregon State with the high school band. Of course, with my sister there I never thought I'd ever go anyplace other than Oregon State. That was my main consciousness.

And so you came to OSC and went directly into the School of Engineering?

Right.

Do you remember your first impressions of the School of Engineering and also of OSC?

Well, I remember my first term I had a terrible time with physics. We had not had as much math in our high school as the Portland schools did, and they dropped us into things where you really needed some trigonometry that we hadn't had. Gee, I was terribly worried that I wasn't going to make it scholastically. At first, I remember going over to see my physics professor, and he assured me I was getting along all right.

Had you decided what type of engineering you wanted to go into at the time you entered?

Oh, pretty much. I was interested in hydraulics, streams and so forth, and that was under civil engineering. We took a general engineering course the first year and you had some electrical, and things that were like electrical, and some civil and some mechanical. I remember one of the professors who was an electrical engineer had suggested that maybe I ought to go into electrical engineering. But I felt that the civil engineering fitted the things that I wanted to do most.

You wanted to survey too, did you say?

Well, I wanted to build things like hydraulic structures, which would be like dams and power plants; those things have always intrigued me.

Did you know any engineers in Oregon City?

Oh, not really well. Due to the fact that the generating station for much of the power for Portland came from Oregon City Falls, there were engineers there that had to do with the power station. Didn't know any of them well.

Your interest stemmed from your reading and your observations?

Yes, observations. I would say probably my father was always interested in things that had to do with use of water, and those kinds of things, and although I can't ever remember him talking to me about it, I would imagine he well could have. I'm sure it rubbed off on me.

So you went into civil engineering when you first started school?

The second year is when you had to decide, I elected to go to civil engineering. And also, my first college roommate, a man by the name of Jack Graham whom I greatly admired, was in civil engineering and I think that probably had some influence on me, too. He came from Portland schools but had done lots of things, interesting things. His father had been in construction; had done the construction of the piers for the Golden Gate Bridge which was under construction, or being built, at the time I was in college.

How did the Depression affect the goals and attitudes of the engineering students?

Oh, I think the main thing is it made us work real hard because we wanted to have a good record so we could get a job.

Were they pessimistic about finding jobs?

Oh, kind of fatalistic, I think. They figured that all you could do was the best you could, and I think they figured that if they got out with a reasonable record they'd get a job. And by the time we graduated, by 1938, things were beginning to get better and more people were getting jobs and so forth.

What were the circumstances surrounding your getting acquainted with Holly Cornell?

In civil engineering, you knew all of the civil engineers in your class because I think there was, I can't remember, exactly but probably not more than twenty-five civil engineers in our class. Probably in lots of our classes there would only be fifteen of us. And you knew everybody.



Holly Cornell

You all worked on projects together?

Yes. And you could sometimes study together. In surveying, you'd have a three-person survey crew and you'd rotate. One of them would run the instrument, and the other would carry the rod and the chain and so forth and you'd keep rotating. We had a survey class that met every Saturday morning. Then you used to go to school five and one-half days a week and we'd have a project out by University Apartments. Now it's up on Witham Hill but that was way out in the country then. Sometimes we'd survey all day; we'd take our lunch. So, you get to know the people pretty well.

What attracted you and Holly Cornell to each other?

Oh, I don't know. We got to know each other and got to be friends. Didn't do a lot of things together but kept in touch. We were both in campus politics. He was in a different party than I was. We never ran against each other, but he would be running for something for his party which was the blue party, and I was in the orange party. It was mostly by houses that you divided up party-wise. I think Holly is broad enough minded, and I guess I am, that it wouldn't cause any problems over being friends or working together if it seemed like it was advantageous.



Fred Merryfield

Fred Merryfield, I think, kind of helped us come together. And then we were both going to graduate school afterwards. A man by the name of Grant Robley

who had been a graduate assistant here was going to Yale, and Holly went to Yale. And I was going to MIT, and Fred got us together. Grant was the only one that had a car that would run that far. I had an old Model T. We all drove back there together and it took like ten days or two weeks to drive from the West Coast to the East Coast stopping mostly along the way to save money with either friends or relatives that one of the three of us knew.

Did you ever discuss with him as undergraduates this idea of starting your own firm?

Well, yes. We sure did. And Fred, I think, really planted the idea. But we talked about it. They wouldn't let you smoke on the campus. Fred liked to smoke. I remember his classes and some of the people would be standing out on Monroe Street where Fred could smoke—and I guess Holly smoked, I never did—chatting with Fred and sort of batting the breeze. But we talked while we were still in college. We talked about, well, someday we ought to have an engineering firm.

So you and Holly Cornell and he would talk about his firm idea? Can you remember any of your dreams?

Oh, yes, basically I think we just hoped, you know, to have some interesting small things to do and make enough living to survive. Burke Hayes—although he's an electrical engineer—had taken some hydraulics courses. He was interested in hydropower, and I don't know if he had taken them from Fred or from Fred's very close associate and the head of the department, Charlie Mockmore.

Burke came from Pendleton and Fred's wife, Mildred, who died quite a number of years ago, came from Pendleton and their families were friends, so Burke knew Fred and Fred knew Burke from early times, too—maybe even before he went to college. He'd been, you know, in Fred's home and that sort of thing, too. It was all kind of tied together.

You met Burke through Fred?

Oh, not really. I can't remember just how I met Burke.

Well, back at OSC, did you talk with Burke Hayes about the firm idea?

I don't remember talking at Oregon State but we did at MIT. My memory is, that he indicated an interest because we talked about, what we were going to do when we got out of school. Well, by the time that I got to MIT, I had an offer from Standard Oil Company which I'd accepted. It was to be after I got done with my year at MIT. So I knew where I was going to go to work by then which was a very comfortable feeling.



Burke Hayes

What need did Fred Merryfield see that you people could fulfill? Was it in sanitary engineering?

Oh, I think so. Well, yes. But kind of the general thing. There were two main engineering firms in Portland at that time. There was Stevens and Coon which later became Stevens and Thompson and then became Stevens and Thompson and Runyan and then they were bought by a Texas firm. They became STRAAM. Then there was John Cunningham and Associates. John Cunningham was a well-known engineer and he had a group, and Fred had worked for those people in the summertime on special projects. But Fred felt that there was a need for something more in the way of engineering firms, and some people that were younger with more advanced ideas and one thing or another, I think. And he saw an opportunity, and I guess he saw us as possible people to work with him.

Was it after you graduated he was thinking about this or was it while you were still in school?

I think he planted the seeds when we were in school and he kept in touch with us when we were graduated. And I, of course, kept in touch with Holly because we'd ridden back together. He was down at Yale and I was up at MIT. We visited each other, and Burke was there.

Holly and Burke didn't know each other then?

Not real well, but they knew each other. Sure. Again, it was a small school and, you know, we were all part of the senior class. When I came to OSC there were a little over three thousand students at Oregon State so it wasn't all that big of a school. It had been bigger. It had been up to like five thousand but the Depression caused it to fall off. Maybe thirty-five hundred; I don't remember exactly. The idea of a firm, sort of developed. I had talked to Burke quite a little bit about it.

And you felt that Burke Hayes and Holly and you, and Fred, would all fit together then?

Yes, I felt that.

How did you happen to choose to go to MIT?

Well, through Fred Merryfield's urging I applied for a Tau Beta Pi fellowship—that's a national fellowship—and I got it. Tau Beta Pi's an engineering honorary and I had applied to a number of schools, again through Fred's urging, and actually had been accepted at Harvard. But MIT gave a complete tuition scholarship to all these Tau Beta Pi fellowships and when you added the fellowship for living expenses, it completely covered what you needed for a year of graduate school without having to work or to be a teaching assistant or anything. So, even though I had this offer from Harvard, I had not accepted it and I decided to go to MIT.

It was purely coincidental then that Burke Hayes should go there also?

Yes, that's right. It was coincidental. He had gotten a teaching assistantship and graduate appointment there.

So Fred Merryfield helped you get to MIT?

Yes. That's right. He urged us to fill out the applications and wrote recommendations.

And the plan was, that after you finished your graduate study, you would come back to Corvallis and start the firm?

No. No. You still couldn't. We weren't ready at that point. To get registered as an engineer you have to have at least four years' experience, and we weren't ready at that point.

This was a long term dream then?

Yes, it was a long term dream. See we graduated in 1938, and of course, with time in the military—Burke was in the Navy—we didn't start the firm until 1946; so that was eight years after.

How did you like MIT?

Oh, very much. I'd made just one trip to the East Coast and I was really a small town boy. Corvallis was a very small town, particularly then, it's small now. And boy, just everything opened up there, you know. There were so many things that were new to me and exciting, and I had a wonderful year there.

Had you had much contact with Holly Cornell? I know he was at Yale.

Oh, not a lot. But I went down there to visit him once or twice and he was up once.

And you kept this idea of starting your own firm alive there, too?

That's right.

How about Fred Merryfield? Did you see him during that year?

Well, not during the year. But we had some correspondence. heck!

He had a fatherly interest in you?

Yes, sure. But I think, in those days, a lot of the professors had a lot of the students they'd kind of followed for a long time because they didn't have so many of them.

Was there anybody who was influential in your life while you were at MIT? I've seen some of your lecture notes for some of your speeches, and you quoted some from Hardy Cross. I know that he was quite an exceptional professor from Yale. Was he someone that you knew?

No. I'd met him through Holly. I really didn't have anybody at MIT in the way of the faculty that had much influence on me.

You said that you had gotten the job at Standard Oil before you even started at MIT.

That's right.

THE WAR AND PLANS FOR THE FIRM

How long were you there before you entered the service then?

Well, I went to Standard Oil Company in the fall of 1939 and got called to active duty in July of 1941, not quite two years.

How did you like working for somebody else?

Oh, I liked it fine.

It didn't frustrate you that you weren't working for yourself?

No, no. There was so much to do and so interesting. No. I liked it fine. And if we hadn't decided we wanted to start the firm, I could have gone back to Standard Oil, I think, and been very happy there...

But the dream of starting your own firm was still kept alive during those years?

...but I think I wanted to get back to the Northwest. In spite of the nice weather and riding around on the bicycle, I wasn't all that intrigued with southern California. I think I liked the Northwest where we had a lot more streams and trees and so forth.

Would Fred Merryfield write you about possible projects that you people would work on eventually?

No. Not until just really in 1945 when we saw the end of the war and then he wrote about the opportunities at that time. Fred was in the military too. He was down in New Guinea during much of World War II. He came home early. He'd had some health problems. Of course, he was a little older person.

That's right. Did he write to you about this firm idea when you were at Standard Oil? Do you remember?

I don't ever remember writing about it. However, I kept in touch with Holly a little more and I think we used to mention that maybe someday we'll do this firm business. It looked like somebody, or most of us, would get into the military and we didn't see any chance of starting the firm until we'd both had, you know, say four or five years' experience just to know what to do, and the other thing is to get so you could get licensed.

So you were on Hawaii until...

From the beginning of 1942 to actually when I left to go to Saipan in May of 1944.

Did you think of more ideas about this firm while you were in Saipan?

I corresponded with Holly a little bit. After the war was over, why things were sort of holding; had to wait to get transportation back to the States and get released and so forth. They had a point system based on the number of months you'd been overseas and those [with the most points] were supposed to be the people who got released first. And, gee, I had

many, many points more than I needed to get released but it had to be worked out. So, oh, to kind of get my hand in, I got books on sewage treatment and read them, and drew the plans of a possible office in the future for us and a hypothetical location and houses and one thing or another.

Then that's when the correspondence really started between Holly Cornell and Fred Merryfield and Burke and I. Let's see. Holly Cornell wrote from Camp Gruber, Oklahoma, in August 1945 and said he was back from Europe in one piece.

Fred believes that a very valuable service can be rendered to the state by some honest engineers who aren't just always trying to fill their own pockets. After two or three years and things have gotten started, Fred would drop out as a very active partner but would like to be able to work with us during summers so he could make fifteen hundred to two thousand dollars a year over his teaching salary. I don't think he will ever give up teaching." So he says, "Jim, let me know soon what your ideas are on this. Are you still interested in trying it? Whoever gets out first should go ahead and get the thing started." He said, "I sure would like to hear from you soon, Jim, as to what your plans are. So far, I think we have a swell opportunity here if we can get started."

I realize one of the reasons why you started the firm in Corvallis was because of Fred Merryfield. Did anybody consider that it might have been better in a larger town, or were there other reasons why you came here?

Well, we talked about it some. It was very easy because Fred was here and Holly's wife had been here during the war years, wife and little boy. But we also thought that there was some advantage to be close to the university laboratories and library for an engineering firm. At that time, it was the only engineering school in the state.

The thing we didn't realize was that it would be advantageous from a recruiting standpoint. We didn't really consider very much that recruiting of engineers would ever be a major factor in our business or that there would be much difficulty because, except for Fred, we'd all gotten out of school during the Depression years when jobs were hard to come by. Although Holly and I both worked for Standard Oil as engineers, a number of engineers went to work for Standard Oil and worked in service stations rather than work as engineers.

I don't know about our class but in that time, why engineers and everybody else were just taking any job they could get because jobs were scarce. So we thought it would be a good place and I think, I personally and my wife felt, that we would like to live in a university town and not too large a town.

So there were several reasons why Corvallis was a...

Yes, seemed like a good place and it was easy too. Maybe we took partly the path of least resistance.

Have you used the lab and the library facilities as much as you thought you would?

Oh, I think so, yes. I don't know about the lab. We've used the library a great deal and still do use the library. Our librarians make several trips a week to the library to pick up things for the people and through them we can get access to the state library.

THE BUSINESS IS FOUNDED

I'd like you to talk about what motivated you men to want to start such a risky venture when you probably could have gotten a very lucrative job back at Standard Oil or some other place.

Well, I guess, one of the reasons we probably didn't know enough about it to know that it was risky. (chuckles) And, oh, I think, we had kind of a dream. Fred Merryfield had planted the idea when we were in school but I, for one, had the dream of having my own firm. I was interested in being back in the Northwest. I enjoyed working in the Los Angeles area and working for Standard Oil but I had come from the Northwest and I liked it here. And then just, I guess, sort of the idea of doing things on our own.

In the last couple of years in the military out in Saipan, I had been in charge of a design group for the island on my own and was actually planning the operation and working up list

s of materials, equipment and troops needed. I liked having a unit, to have a major input, rather than being part of a big company, although Standard Oil was a fine place to work and I enjoyed it. So, I think an awful lot of people dream of starting their own company.

I had a little bit of money. The whole four years of the war I had been gone, my wife worked. She was an x-ray technician, and she worked in hospitals while I was gone. A good deal of the time I was places where I couldn't spend any money. They gave us free candy bars and I didn't smoke the free cigarettes, and there was nothing to spend any money on an island like Saipan—there were no stores, no tourist shops, no nothing. So, I thought I had quite a little bit of money and it seemed like a good time. At that point, we didn't have any children.

You had no fear that you would fail?

Oh, sure we thought about it, but felt that if we were willing to work, we could work it out. We didn't visualize being a large firm. We thought we could probably get enough surveying work and small projects to keep us going until we were able to do something more. Fred Merryfield had confidence that something would go and we sort of looked up to Fred Merryfield for things. I don't remember having great concerns about failure.

Was one of the goals then, to become a millionaire or just to work in engineering?

No, no. The goal was just to work with some nice people and just to have enough to have a moderate existence. I was married. I hoped to have a family someday but didn't have any idea or aspirations to have great wealth. We were interested in working in a place where we liked to be and where it was a good place to raise the children and work with nice people

and that was our aim and it seemed like we could do that through this organization that we put together which was, of course, very small.

Usually I think of a small business as being almost all-consuming because you have to work all the time—twenty-four hours a day almost—to keep it going, but that didn't concern you?

Didn't concern us and we surely worked, all of us, I think, very hard. Maybe not twenty-four hours a day but awfully long days, and sometimes we worked all night.

Was it a family effort then?

Well, a little bit but not too much. At the very beginning, Cleo Cornell, who was a good stenographer and who had worked as a stenographer when Holly was going to Yale—she'd been a school teacher too—used to type some of the reports. And my wife would help put them together and collate them and then, a few times, she helped by looking after the Cornell child, Steven, while Cleo worked at the firm.

So it was cooperative in that way, but actually we had the good fortune that our business took off very rapidly, partly through Fred Merryfield's contacts, in fact a great deal through his contacts, and partly because there was opportunity for engineers. It was right after the war and things were getting going and people were looking for engineers and they didn't have ties to other firms. Some of the projects had been set aside for a good many years because nothing much could be built other than military things during the war. So it was a good time.

So very rapidly why we needed a full-time secretary and hired a secretary, and we needed some people to do surveying and help with the drafting and engineering. The first people were part-time that we hired but it was just a matter of a couple of months or less, I can't remember for sure, and we were hiring people. So, from that point on except for the, oh, the annual Christmas dinner and the picnics that we had and so forth, the wives of the partners didn't get very much involved in the business. They looked after the home front, and I think did a marvelous job of supporting the other people, but stayed clear. Fortunately, none of them were the type that wanted to meddle in the business. This can be bad in small businesses, but they weren't that type of people.

Fred Merryfield had been teaching for years and years, since the twenties, I understand. Why was it that he chose Burke Hayes and Jim Howland and Holly Cornell out of all of his students to be the ones to start a firm? What did you people possess that he thought was worthy of being partners in the firm?

Oh, I guess that's a little hard to say. I don't ever remember discussing with Fred why he talked to us. He may have talked to other people who didn't respond—I think that's entirely possible—and they felt, as you pointed out, that it was too risky or too something, or didn't have the

opportunities. Fred was a very unusual person and some people didn't get along easily with him so maybe we had the ability to see the tremendous strengths of Fred, and not to see his peculiarities. But, he must have thought that we were compatible-type people.

Fred had a great ability... one of the great things he did for the firm was to pick the people from out of his students and the early people—some of the leaders now—Earl Reynolds who is Chairman of the Board, Sid Lasswell who heads up all the technical end, Bob Adams, Jim Poirot and Fred Harem and those people were in his classes, and he saw them as the kind of people that would fit in this sort of business. When they were looking for places to work after they got out of school, why, he didn't ever force them down here or anything but he'd suggest that here is one of the places they could look, and they'd come in and talk to us about it. Fred was a great person on students, I mean on picking people. We often wondered how he did it because he seemed to dominate the conversations. Whenever there was an interview, why Fred would sort of dominate the conversation but he had a great ability to evaluate people.

He was perceptive, then?

Must have been. Well, surely. He was very perceptive. You could see, easier, how he would do it with his students, because he could evaluate their work and their writing and all that sort of thing; but just on interviewing strangers, why he was perceptive of which ones would be effective in the firm. I don't believe I ever knew of anybody that Fred said was good, but that he was a very capable person. Now, there were some people that Fred wasn't so very enthusiastic about who I thought were pretty good people. But of everybody that he said was good, I didn't see anybody that ever turned out not good, as far as I can remember.

You said, he was unusual. Do you mean his ability to choose good people? Is that what you mean by unusual?

Well, he was unusual. He did a lot of—he was a little flamboyant. If somebody would go to sleep in class, he'd hit them with an eraser or throw chalk at them.

That woke them up!

Yes. And he'd sort of heckle the students some times. I know, Archie Rice... Archie's name was, I guess, Archibald or something, and Archie didn't like the name and Fred would sort of heckle him sometimes. And the classic story was that he was erasing the board and the eraser flipped out of his hands and he kicked at it and it went right out the window—it was open. So, yes, Fred was someone who would really read a report, or read a paper, and he'd mark it all up. I remember I did a curve once for him, and I thought I was doing a fine job. I

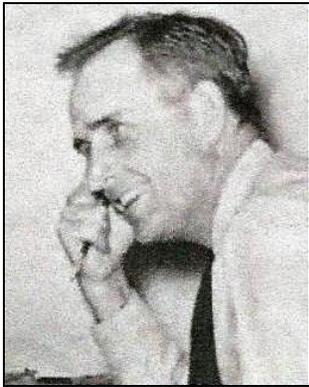


Archie Rice

colored the area under the curve, I don't remember what color but probably purple or something, and I remember on the side he said "slightly bilious, Jim." Fred was an amazing person. Unusual. A great idea person.

Did it concern you at all that he might do something too unusual and hurt the new firm?

Oh, I don't know. I don't ever remember being particularly concerned. I think a number of people were surprised that we were able to stick together. They thought that Fred was, oh, very strong in his opinions. That maybe we wouldn't hang together. But we did and that's why it was eventually successful. We were very lucky. Nobody got sick, violently sick; nobody got hit with a truck or a taxi or anything; and nobody got mad and quit. And to have—really six people when you take Ralph Roderick and Archie Rice because they were leaders of the firm as much as the four of us who started it—to have six people who worked together for thirty plus years, with nothing happening, why we were very fortunate.



Ralph Roderick

That is unusual. It didn't create any problem because of the previous student-professor relationship that you had had with Fred?

Oh, I don't think the student-professor relationship created any problem. One of the things that did create problems was that some of our competition felt that Fred shouldn't be in an engineering firm and provide competition, and they claimed that the drafting was all done by students and some of the engineering was, and so forth.

Actually one of our competitors went to the State Board of Higher Education or the chancellor and proposed that they not let Fred do this. It was a little bit unusual in the Northwest for the professors to have outside businesses. Back in Massachusetts at MIT, where I'd gone to graduate school and Burke had gone to graduate school, it was very common for professors to be part of an engineering firm and do all kinds of outside things. But it wasn't so common here and so, I think they tried to get Fred out of the engineering business figuring that he wouldn't quit the university. But the State Board elected not to do that, or the President or the Chancellor or somebody, and Fred went on a part-time basis even though he spent surely full-time at the university. He didn't take full salary after we formed the firm.

His being a professor as well as a partner in the firm didn't cause the firm any problems?

Well, because of Fred's nature, it didn't cause particular problems. I mean, Fred wasn't of a nature to sit down and spend long hours turning out a report or something. He was the kind of person that could think of new

things to do and so forth. You know, he was supposed to work full-time in the summers.

Here or at the university?

At the firm. Because he'd get paid for nine months only at the University and then he'd work, or he was to work full-time in the summer. That was the plan. But often, early in the game we'd turn over some kind of a project to Fred, and usually somebody else would have to finish it up. Fred would have to go off to a meeting, or he'd see an opportunity to make a contact with somebody in Washington state, or something. He wasn't a detail design person at all.

More people-oriented?

Well, people, yes, people-oriented and kind of theoretical-oriented.

He never considered quitting his job at the college and working full time with the firm?

Well, he didn't do it anyhow; I don't know if he ever considered it. But he really fit best at the university, I think. He was very valuable for his overall thinking and ideas and contacts, but I think in the early days, for day-to-day work, why he really didn't fit. Now, later on when we were larger... He retired at the University when he was sixty-five, then he worked four or five more years as the personnel director—we called him the Staff Manager—he was very good at that.

So, looking back what would you say was his major contributions then to the firm?

Well, of course, I think his big contribution was the idea of putting it together and having it; that was his. And the selection of people, not only the original partners but other people. And then his great contacts, and knowledge of all the people in the public utilities, particularly, throughout the west. He knew all kinds of people and most of them thought of him very favorably.



Fred Merryfield, WWI
RAF Pilot

I didn't read anything about how he happened to come to Corvallis. I know his homeland was England.

He came... This story is a little fuzzy in my mind but, basically, he'd been a flier, and there was some sort of a trial in Canada of people who had furnished inferior wood to England to build airplanes—and there had been crashes as a result—so they had people from the Royal Air Force sent to Canada to act as some sort of a jury for the trial of these people, or witnesses or something. And then Fred got acquainted with somebody from Oregon and he decided he wanted to come to Oregon.

So he came to Oregon and he worked, actually, as a laborer on roads, and he lived in a tent, part of the time, down by the river. Worked the night

shift in the sawmill—the sawmill used to be at the mouth of the Marys River while he was going to school. He decided he wanted to go to school, and he didn't have any money. He had a very meager existence. I'm surprised some of the other people didn't talk about this to you.

Well, Mr. Hayes mentioned that he had crashed while in an airplane and said that he had arrived on a train and decided that this place looked like a good place to be. But somebody else said something different.

I guess the stories get changed, but my memory was that he had a friend with whom somehow he had gotten acquainted, and he went into southern Oregon and actually worked on a road crew down there for some time, then decided that he wanted to go to college. How he decided to be an engineer, I don't know. His father had been a foundry man in England, you know, worked in the foundry and had been very active in the early labor movements.

Fred was a Democrat in the days when there were very few Democrats in Oregon. Fred used to say that there should be an opposition—I guess that comes from his English background—there ought to be an opposition and also, I assume, some of the philosophies of the Democratic party were more attuned to his philosophies than the Republicans; so he was always registered, as far as I know, as a Democrat as soon as he got to be a citizen.

He sounds like he was a real character.

Oh, he was a real character and a marvelous person.

Going back to when you were just starting the firm in Corvallis, do you remember your emotions as you were going cross-country from the East—your emotions after being in Saipan all that time, and thinking about starting this new firm? I know it was a rushed trip, wasn't it?

Well, yes and no. It was in the middle of the winter so we took a southern route and came into Los Angeles where I'd lived, and visited some friends there, some fellows I'd lived with before we were married. We were married in June, and then I was called into active duty in July, and then was shipped out the end of December.

So you hadn't spent much time with your new wife, then?

No, not very much. But I don't know. I guess I was just so pleased to be home I just figured that nothing would happen that would be very bad compared to what could have happened. I was just delighted to be home. I don't remember any great emotions other than I was just pleased to be there and heading into something interesting and people that I thought were good people to work with.

Undoubtedly, yes, we undoubtedly had doubts and concerns. I can remember after we got underway and got farther along, you know, being concerned about how things were going to go and one thing or another,

particularly when we had some problems with our projects and they wouldn't go right. But as far as starting out, I think I was just so delighted to be here and out of the Army, and be with my wife and everything, I couldn't see a lot of problems.

What was the first order of business when you joined with the other two partners, and soon after, when Burke Hayes came? What did you people have to deal with first?

Holly and Fred had already rented a room downtown above what was then a hardware store. When I came why there was a room right next to it that was available, about ten feet square, ten by fifteen, and the question was whether we should rent that, for I think ten dollars a month, or not. We finally decided that we would splurge and add another room.

But we had some work to do right off, some jobs that Holly and Fred had lined up. They had some work for the City of Albany and, I don't know how we decided, but anyhow we decided I would work on that, so I went to work doing the study. It had to do with garbage disposal and waste treatment for Albany. So we just went to work.

The management of the firm we kind of did on the side. We basically just got some projects and started working on them, and then we had to go out and get some more, so we would go call on people and see about doing work for them.

I understand that you and Holly Cornell traded being manager. Did you think that was one of your skills at the beginning?

No, no. Really didn't; didn't really visualize being a manager; just kind of visualized being an engineer. And, of course, in the early days, we spent maybe eighty or ninety percent of our time on projects—getting or doing.

You weren't so concerned with goals and philosophy and that kind of thing?

Not at all. We just were trying to get the jobs done, just get them turned out, and get people hired that we needed, and get facilities, and just kind of get the job done. Basically, every project was assigned to a partner and everybody else you had would help. You know, with every project, you'd bring in some help to help do it, but one of the partners looked after it.

How did you go about finding projects in those early days?

Well, we started by just calling on cities and so forth. Often Fred would know who to see. So we'd go, gee, up to McMinnville. One of our early jobs was McMinnville. One of them was Forest Grove. Fred knew the superintendents of the water department and the light department there and he'd say, "You fellows better go up and see them." So we'd go and tell them that we were in business—after a while we developed a little brochure but we didn't at first—we'd say we understood, maybe we saw in the paper, that they had a problem with water or something.

Then Holly Cornell, at Yale, had studied under a famous structural engineer, Hardy Cross. Hardy Cross had also developed a system for analyzing what we call water grids, the pipelines which grid a city. You know, they go down each street. This way to analyze the flow was a new thing. The tendency had been to use very approximate methods to decide how big a pipe should be to go down a street to provide enough water for the fire hydrants and for the people to use and everything. And so Hardy Cross, developed the structural system analysis which he called moment distributions and the hydraulic analysis was flow distribution system. Holly knew how to do it. And we developed some for doing it. We went out and sold it to the water superintendents.

With this analysis we could tell them how much fire flow they'd get out of a hydrant under certain conditions, and that if they put in a six-inch pipe what it would do, and if they put in an eight-inch pipe what it would do, and that we could often save them the cost of the difference between say a four-inch and an eight-inch pipe. If you just saved a block of the difference, it would more than pay for our study. So quite a few cities hired us to do that; and that, of course, got us acquainted with them and then when they had other work to do, if they were satisfied with what we did, they'd ask us about doing that.

This was an innovation that other firms did not have?

Well, yes and no. I mean, it was available in the books and so forth; but these other firms hadn't had somebody that had really had worked with the developer of the system and we could say, "Well, we know how to do it because Holly Cornell studied with Hardy Cross." In those days the major water systems were managed and the engineering was done by engineers. Now there is often a non-engineer Director of Public works and under him is the street sweeping and everything. But it used to be the city engineer that directed all that and he was almost always a registered engineer. So you didn't have these trained, or not trained administrators, looking after the physical facilities of the community. Almost always they were engineers, and they would know about Hardy Cross, and it would mean something to them that the person had studied under him. This was just one thing. Of course, in the meantime, Burke Hayes was out selling electrical work because he knew particularly about it.

I remember one time very early Burke and his wife and my wife and I—this was before any of us had children—took a trip down the coast. We went over to Toledo first. They had a municipal power system there and Burke went in to see them and talk to them about doing electrical work. Then we went over to Newport and talked to somebody; and we went down to Reedsport; and then we went to Coos Bay; and I talked about water and sewage and other things and Burke talked about electricity to people in these cities. We'd spend several days out just knocking on doors and trying to get acquainted, and, you know, after a while, they'd call up or write us a letter and ask us to come to talk to them.

And then we would go to the Municipal League meetings. And then, of course, particularly with Fred to help introduce us, we went to the Northwest Water Works Association meetings. Once a year they had a major meeting and at the Champion Sewage Works meeting there were both engineers and consulting engineers, but mainly the people that went to those things were water superintendents and sewage superintendents, and it would give us a chance to get acquainted with them.

I assume other firms were doing this also.

Yes, other firms were doing it.

Why did clients choose you over others? I mean, what special qualities did your young firm possess?

Well, oh, I don't know all the reasons. Maybe we were convincing talkers and thought we knew what we were doing. Maybe they had had unsatisfactory relations with other firms. It's awfully easy sometimes to really do what is a good job and still get kind of crosswise with the clients; they get unhappy when really you've done a good job for them. Then after we got doing a few jobs and had done some things that were rather innovative, that were different than the way the old line engineers did them, why people got to saying, "Well, you ought to talk to those fellows."

Like we're designing waste treatment plants, and I don't know how early this was, but our waste treatment plants worked very well and cost less than others because by that time, we had Archie Rice and Ralph Roderick. Fred knew the theory, and those people knew how to put it together, as well as theory, and they did innovative things. They did things differently. Ralph had come from the Midwest where they had more experience in municipal utilities; they'd been at it a longer time. He'd worked for a company there, and he brought new ideas to us. So I think we got a reputation very early for doing good work and charging modest rates, and our projects worked. And I think that, oh, people like Holly Cornell and Burke Hayes and Archie Rice and Ralph were all young, personable people, and spoke well, and seemed to know what they were doing; and people like to work with personable people.

Was there one of you who was more aggressive at finding these projects than the others?

Oh, I don't know. And, of course, you know, it's a matter of kind of project. You choose an engineer almost like choosing a doctor; particularly in those days it was more that way. Sometimes you like one and sometimes you like another. Some people had the most success with the larger cities. I know Holly was always very good with the larger cities; he was able to move into the bigger cities. And Burke had a very good manner with the electrical people and had a good background.

And Archie and Ralph knew a great deal; also were very personable people. Archie is a tremendous salesman; Ralph was a tremendous

salesman, too, you know, and in a very low key way. We didn't sell engineering services like hotdogs or magazines. Basically, the sales approach was that the person or the city council or the mayor would say, "Well, we've got a problem. We've got a problem that we don't have enough water." We rarely used sales people per se. If they had a water problem, Archie was a great expert in water, and he'd go and talk to them about, "Well, here's all the ways you could solve your problem. And here is a general kind of cost." If they need a new well, "Well, "he'd say, "The geology is such that you could probably get a well in so many feet, and it'll cost you so much dollars a foot and the pump will cost you about so much;" and you'd talk to them about how to solve their problem. If they believed that you could do it, why, then they'd hire you to do the engineering.

When did you discover that you needed some kind of an overall manager of these projects and your people?

Well, of course, very early we knew that somebody had to look after various aspects of the thing. Maybe you've heard this story. Basically, we figured Fred would not do any management work because he was only very part-time. Holly Cornell actually had some contact with a bank. He was a bank messenger between the time he went to high school and college; he was out a couple of years. So he knew something about banks so we figured that he would look after finance, billing, and that sort of thing.

Burke Hayes, he'd worked as a draftsman and worked as a surveyor; he knew about surveying instruments and knew about drafting and so forth, and he sort of looked after the equipment and the supplies. And I sort of looked after getting the people hired and sometimes we needed somebody.

But then we decided that we really needed somebody who would handle all those things together. It kind of didn't work so well the way we were doing it. My memory is—and I would be interested in how the other people remember it—my memory was we just said, "Well, we'll start with Cornell, and he'll be the manager for six months, and then we'll get to Howland, and then we'll go to Hayes." So Cornell was the manager for six months, and then it was my turn and then at the end of six months they kind of said, "Well, you know, Jim, why don't you stay on and keep doing it. It really isn't very good to change every six months because you just kind of get into it in that time." And my memory is, I felt, well, that's right. I had really just got a feel for the thing. So I guess about every year I offered to resign, I hope I did. And every year they said, "Well, why don't you do it for another year." And so I did it from, I guess it would be sometime in 1946 or early 1947—I don't remember when we made the change and I became the manager—but I did it until 1974. I became the president when we changed our form from a partnership. We called it the

managing partner. And then the president. But a big part of our time was still spent doing projects.

Did you want that responsibility or did somebody just have to do it and you ended up doing it?

I used to always think, well, next year we'll change or something. And I guess I felt maybe probably that was as good a place for me to be as anybody. We ran by committee, you know. I didn't make a lot of the decisions unilaterally. I'd work up the data and so forth but basically the six of us, later on maybe the five of us, met and made a decision. Clair Hill used to say he didn't see how we ever got anything done because we always did everything by committee. So the manager really wasn't the hierarchical sort of thing where you pass down decrees. I mean, we worked it out together; it was management by committee.

Why did they think that you would do better than, well, Holly Cornell or Hayes or Rice or Roderick?

Well, I don't know if they thought I'd do better. Maybe they thought Holly would be better off doing projects, and Burke doing his thing because he was the only electrical we had—we had four civil engineers, five, heading up things, and hired some soon after. So it just seemed to fit, I guess, reasonably well.

What qualities did you possess that made them think you'd be a good manager, then?

Well, I don't know. Maybe they thought I wasn't as good an engineer as they were. Maybe that's it. (laughs)

You're being too modest.

No, I don't think I was a real strong designer. I liked doing engineering projects and I liked doing layout and design and so forth, but I don't know. It just seemed to fit and they said, "Well, why don't you keep doing it, Jim?" So I did.

What was your management philosophy then?

Well, you know, the management philosophy kind of evolved. I don't really like conflict very much; in fact, I don't like conflict at all. And so I guess in order to prevent conflict, you needed to plan things out ahead and get people knowing what's going to happen and also make the people have an interest, an interest like in the ownership; then you don't really have to manage them much. Everybody will get in and work hard. So we very early took Ralph Roderick and Archie Rice in as partners for 10 percent each and the rest of us then had 20 percent instead of 25 percent like we had to start with. Then we felt that it was only fair since they were making such a contribution that we be equal partners so we each had 16 2/3 percent and then later on...

That was your idea?

Oh, I don't know if it was my idea. I surely felt it was a good one anyhow; you know, it's a lot easier. Boy, if somebody is an owner, you don't have to tell them to get in and work all night. They do it anyhow. So I guess my philosophy of management, that sort of evolved, was that if you kind of keep most everybody advised and you bring everybody into the decision making and let everybody share the rewards, why then you don't have much of any management problems. They solve themselves. They really have to be kind of self-controlled. And I think, at least, that was the way I operated as a manager and basically the way we operated as a firm. I think, basically, you do best if you don't have to manage people very much; if you just make it best for them to do what's right.

It's a question of how to motivate them to do that, though?

Yes, you know, the thing is to give them some ownership and get them in on the decision making. And actually I'm going through that a little bit right now.

Originally there were six partners who were very strong-willed individual people. Surely there must have been conflicts. How were those conflicts resolved?

Oh, yes, sure there were differences of opinion. I think we had very unusual people; all of them were willing to walk a mile in the other person's shoes, so we tended to not have great confrontations. I think we tended to sort of just ease into things. (chuckle) I guess, you know, that was kind of my approach as the one who had responsibility for the general management. Rather than have a big argument, why, you'd say, "Well, sure, you see it this way and I see it this way, let's kind of work around it a little bit."

We used to meet for lunch, everybody who was here, every Monday. I still do that with the personnel group here. We meet every Monday. Not the whole twenty of us that are here but the people that head up various groups. And so when we were downtown the partners used to go out to have lunch together on Mondays and later when we got into our own building we'd bring in lunches—we'd either bring them from home or have somebody go downtown for them.

Can you describe a typical Monday luncheon? What would occur?

Oh, all right, I think we all felt, and I felt, that you need to have an agenda. So we usually had an agenda written down. (Pulls an agenda form from the desk drawer). This is, of course, kind of a form now but we used to just do it on pieces of computation paper. We'd write down what we needed to talk about. Later we divided the sheet in half vertically and used the left-hand side to list the topics and the right-hand side to record what we decided. Still later at Burke's suggestion we made a time schedule for the topics.

Would you write down what the group was to talk about or would all get together and do it?

No. I'd do it.

So, you'd run the meeting, then?

Yes, people would say I think we ought to talk about whatever at the next meeting. If somebody would say, "We really do need a survey vehicle, "I'd say, "All right, talk about the survey vehicle on Monday."

Maybe you could characterize each person and how they interacted with the others.

Well, we would make decisions. Usually there would be some kind of a purchase decision, whether to purchase a new chain, you know, a surveyor's chain. Of course, the manager usually, and later on the secretary, would get papers and pencils and everything of that sort.

So you were in charge of the budget. That was part of your responsibility?

Yes, that's right. So we'd work it out. How much money have we got? So we'd say, "Well, maybe we do need a new chain, "or, "Maybe we need a new transit." Then sometimes it would be, well, like we needed a print machine to make blueprints or blue line prints and we'd talk about it and Hayes would say, as happened, "Oh, I can make one. Just let me do it and I'll make us one." Sure, he made one that we used for quite a few years made using fluorescent tubes; it worked pretty well.

But that was the kind of things that would come up at the meeting. We would decide whether we could afford to hire another engineer. We'd say, we've got all this work. I would have probably gone through an analysis and said, "Look, we've all these man days needed for all these various jobs and if we get these jobs, we'll have these other kinds of needs. Do you think we ought to hire another engineer?" And then we'd decide to hire or not.

Who dominated? Were you the dominant one?

I wasn't the dominant one. I basically pulled the information together and that was the thing. It was very much... Archie Rice used to kind of get disgusted that the manager didn't say, "We're going to do it this way," or make the decisions and say, "No." He'd say, "We're just running a commune," As the manager, I had the responsibility for, figuring out how much money we could spend and what sort of jobs or workload we had ahead and I'd work on scheduling, and other people would work on it too. If I was away on a job, why somebody else would do it. Holly would do it, or Archie, or Ralph, or somebody.

I understand your philosophy was "no frills". What about the others?

They were pretty much no frills, all of them no frills philosophy. We would make decisions. Okay, ask to go around the table. We'd start with Fred.

When it came to finances and that kind of thing, Fred said what he thought but he wasn't very active. He was pretty silent on finances and say, advertising—well, of course, we didn't advertise except how we should handle putting professional cards in magazines or that sort of thing. When it came to who we ought to go see or what kind of project we ought to try do or who we ought to hire, why Fred had pretty strong opinions. "Oh, we don't want to hire that person. He's got all these kinds of problems or he will have them."

Did he get his way in those kinds of subjects most of the time?

Yes, we pretty much followed. Then you get to Holly. Holly was always the very strong technical person and structural engineer and later sanitary engineer. But he was very considerate. You always got a very even answer out of Holly. He'd think about it a little bit, and well you listen to Holly because you knew he thought it through. Holly had a great way with clients. They liked to work with him.

And then you had Burke. Burke had marvelous insights into technical things and what you could do technically, the kind of things that we ought to be looking at as far as—well, of course, principally in electrical and the rest of us didn't really have much knowledge of electrical—and how we ought to handle presentations and that sort of thing. Burke was very strong on how to make presentations and how the reports should look. He was the only one of the original four that had really any experience as a consulting engineer. So we listened to Burke on those things, and, of course, as far as the electrical thing, why he pretty much ran it himself.

Then you had Archie. Very, very strong technically. Very good business getter and salesman-type—well, not salesman-type but for an engineer he was very articulate. He could identify the problem and identify solutions, and a great idea man—great for developing solutions to problems. One of the early projects we had was in Juneau. They had a serious problem of how to bring a water line into town down a canyon that was always having floods and avalanches and so forth. Archie got the idea to use an old mining tunnel that had gone right through the mountain, through very solid, hard rock, and so, by golly, instead of bringing the pipeline down the valley like it had always been, why he got the idea to clean out the tunnel, and they just brought the pipeline in at one end and plugged it, and put a plug in the other end, and took the pipe out and saved all that pipe, and the water stayed warm in the middle of the mountain; they had a terrible freezing problem up there. Great thinker, Archie.

Ralph Roderick was a tremendously practical sort of guy. He had worked as a consulting engineer. He was not as old as Fred but older than the rest of us and he knew how things needed to be done and was awfully good with city councils. He had been a city engineer; and Ralph would have ideas on how we ought to work for the cities and what we ought to do and always had kind of ideas on technical things that Archie, with his great

knowledge of chemistry and so forth, could sort of analyze and see the possibilities and so forth. So that was Ralph's contribution.

So you discussed solutions to problems in the projects during these meetings?

Oh, yes. Everything. It wasn't limited to management. People problems. They'd say, "The mayor sure didn't like that very well, and he wants to do this which isn't the right thing," so Fred, or somebody, would know somebody who could talk to the mayor and try to help them see what would be best for the city. We'd talk about any kind of thing that needed a solution.

Sounds like it would take longer than a luncheon period, then.

Well, of course, we met every week and sometimes it did run quite a while.

And so you oversaw all of these discussions, these topics?

Well, I mean everybody would bring up topics. Often they'd let me know ahead of time, but in the meeting if somebody had something, we'd bring it up and we'd write it down, and write down what our answer was. Or put it over until next time.

And then vote on it?

Well, we didn't vote; we just kind of had a meeting of minds, you know. If several people felt it was the wrong thing to do, why we'd say, "Okay, let's think about it a little bit." I don't ever remember, as a partnership, of ever having a formal vote. But sometimes we'd say, if Burke had been quiet on it or Fred or something, "Well, what do you think?" And Burke would say, well, he thought we ought to do it or we shouldn't do it. Or two or three people had voiced their ideas and he would say, "Looks like, you know, Jim and Holly are the only ones that think it's a good idea and the other fellows don't think it's a good idea. Maybe we ought not do it. Maybe we ought to set it aside until we see something better." That's kind of how we worked.

So nobody went stomping out of a meeting then because they didn't get their way?

Don't ever remember it.

Isn't that rather unusual?

Well, I think so. Of course, this basically is the only place I've ever worked. (chuckle) Well, I worked for Standard Oil Company.

You know human nature usually isn't..

Oh, you know, some people weren't always entirely happy. I can remember being pretty disappointed with what the consensus seemed to be on some things but we always kind of came back and thrashed on it again.

Maybe I'm asking a naive question, but were all of these people religious people or were they just exceptionally well adjusted or did they have mutual goals to be able to maintain such harmony together?

Oh, I think that mutual goals is one of the great things. We were all equal partners and we all wanted the firm to be successful, and we kind of let the various people kind of go their way. I'd done some work in soil mechanics and foundation work and so forth, and I sort of developed some of that business; Burke Hayes did the electrical; and Holly developed some structural business; and Archie and Ralph were really the strong sanitary engineers. We would do the things that we had interest in as well as, of course, anything that came in. If a person was willing to get in and work at it, why, we pretty much let the people do as they thought was best.

When did you formulate a firm philosophy? Do you remember discussing that in those early years?

No. I don't remember. We just kind of operated it. I don't ever remember outlining any philosophy until much later, but one thing is we tried always to be very careful to pay on time and to keep our credit good and that sort of thing. I don't ever remember us saying we've got to keep our credit good, but I remember we always did. We always thought that was important. I don't know. Some of the other people you've talked to undoubtedly have stronger memories on those kinds of things than I do. I tend to forget the details and just remember the pleasant goings-on.

Can you describe the feeling in those early years as you met for those Monday luncheons and people were talking about projects and getting more projects? Excitement or...?

Oh, yes. The thing that was always terribly exciting and still is, is when we get a job and get a project, particularly when we get one that is a little different than what we've done before. When we worked hard and lost a job, why then we felt pretty sad. If we had a run of bad jobs, jobs that we didn't get, we could have trouble keeping people busy. When we got up to a total of fifty people or something like that, after we'd been going about ten years, I remember thinking, gee, we've got fifty people and each of them has a wife and two children maybe and there's four times fifty—why that's two hundred people—wow, we're responsible for two hundred people and keeping them fed. We surely did worry about keeping work in.

I think the greatest thrills I got were from, "We got a job. We're hired to do something." Particularly if it was an interesting thing. The other thrill is, of course, when it was all done and you go out and see it work. Those are great thrills. A lot of excitement. We got quite a lot of jobs and we'd get calls from people saying, "How about coming and talking to us about these kinds of things." It was all very exciting to think about, "If we could only get that job, why, it would be really great."

The other thing—we didn't do everything in the meetings; we did an awful lot of talking around. I remember when we were making the decision to build the new office where we are on Western Avenue; it was to be thirty-five hundred square feet which is not much bigger than most peoples' houses, or a lot of peoples' houses.

I don't remember how we made the decision but for some reason I was up talking to Fred Merryfield about it out in his yard—it was summertime—and saying I thought we really ought to go ahead and do this and how did he feel about it. I assume that I had already talked to the other people and maybe Fred had been gone or something. It was exciting...



The 1950 office in Corvallis.

You mean, it was your idea to move to a larger facility?

Well, I don't know if it was my idea. But to build instead of renting downtown over a store, why build our own office, that was exciting.

I bet. Who designed the office?

Well, that was an interesting thing. We fooled around with it. Gee, it wasn't very big or anything. We were having a hard time kind of getting it together, so we got help from a local architect by the name of Jim Gathercoal and he had with him a friend of the family who was here from the Midwest—Russ Egbert, I think his name was. I remember we weren't getting anyplace on getting the building designed, how we wanted it laid out so we met one evening down at the old office and had Jim come in and talk to us. Jim was a little flamboyant, too. I remember we sat around and talked about what we needed, and then Jim sketched out how he thought we ought to lay it out and we said, well, yes, that looked good. So this Russ Egbert came to work with us and drew it up. We, in effect, designed our own building.

All six of you?

Well, yes, and that was part of the problem. That's why we weren't getting anyplace (laughter). And then we turned it over to Archie. Archie's father had been a building contractor in Portland, and Archie knew a lot about buildings and building details so Archie took it under his wing to get the plans out. And this Russ Egbert worked on it and I assume we paid Jim Gathercoal something for being a consultant to us. And we went ahead and put it together, drew up the plans and put it out for bids and got it built; Archie took the responsibility for pulling it together and making it go.

But it was your idea in the first place to start the building? You said you were talking to Fred Merryfield about the idea.

I don't know that it was my idea. I know I always had thought it might be nice to have our own building, and I think a number of us had the idea. We had rather a miserable place downtown. It was cold in the winter and hot in the summer, and it didn't have any windows, and it leaked. We were very anxious to get into something that was nicer and had a little more room because we were running out of space. As I say, I think we did an awful lot of talking first.

CONTRIBUTIONS OF THE PRINCIPALS

You mentioned Holly Cornell several times, but will you now talk about what you feel his contributions have been to the firm?

Oh, well, gee. Holly, oh, tremendous contribution. First is his common sense on how to approach problems. And then a strong technical man. And then he saw that we needed things, like he put together the first set of specifications we ever put together. I guess with my background I had never thought much about specifications. He worked real hard, and got copies out of the library, and got books, and got other peoples' specifications, and studied it, and put it together.



Holly Cornell

Holly has always done that sort of thing. Back in, oh, when was it? The latter part of the sixties, why, Holly was the manager in Seattle and he turned over the management of that to do a production study to see how we should do our engineering, and I think this led us into more use of computers. We'd not been much computerized before that and he saw that that was the way of the future. Some of the things that he proposed that we do we are just implementing now with the project information retrieval system that is actually being implemented with our larger DEC10 computers.

Holly got along extremely well, as I said, with major clients. He was the contact and got us lined up with the Denver Water Board to do the Foothills project which is a large water treatment plant and tunnel and dam. Holly had a strong business sense and a strong technical sense and gets along with people. It's hard to measure any one person's contribution; everybody made a major contribution and it seemed like it worked out that the sum was greater than the parts.

He had more success with major clients than the other partners?

Oh, I don't know that he did better with them, but he was able to work with the major clients and he seemed to have success with getting the jobs and getting acquainted. Through the national American Water Works Association, which he was always active in along with Archie and Fred Merryfield, why he got to know these people and they had confidence in him and he was always very competent. He headed up various organizations. He headed up the Consulting Engineers Council of Oregon, and he was one of the leaders in the American Water Works Association here in the Northwest and so forth.

What would you consider his greatest achievements?

It's hard to single out any one thing. A great thing that he did was open the Seattle office. We felt we needed a Seattle office and nobody really wanted to break out of Corvallis and go up there and he did that. One of the early achievements was putting together our first set of specifications. Our standard specifications were a little different than lots of peoples' but very, very well done and copied by a lot of people later on. And I guess, of course, always the thing that was important about Holly was that, if you had a problem, why, you went to Holly and you got a very considered sort of answer you felt you could rely on.

You mean a personal problem or a business problem?

Oh, I'm thinking of, well, not our own personal problem, but personnel problems as well as business problems and project problems. Very, very thoughtful, good answers.

You mentioned that he started the office in Seattle and then I know he was President after you stepped down. Apparently he had leadership capabilities?

Oh, yes. He is a fine leader. He built that Seattle office into a major operation. He was President after I was and did a good job. Very, very capable person.

Can you describe the difference in management styles between you and him?

Well, in some of the literature, and I guess it has come out describing us, I think when people who did stories on the firm, they indicated that Holly's— I forget what they said specifically, but basically that where my style was pretty much one of just working easily with the people, Holly's style was more organized, more planned and a little bit more hierarchical, which was good. I think we had gotten big enough to where we needed more organization, and perhaps a little bit more saying, "We will do it this way."

Why was he chosen over somebody else like Rice or Burke Hayes, Roderick or another principal?

I think, oh, Burke Hayes was so strong in the technical areas, management was not his great interest. Archie, again, gee, he'd done good management things, but Archie didn't see himself working in that area, nor did Ralph I think. By that time, Fred had retired.

I know that Archie Rice was the president of Microfloc.

He really developed Microfloc and did all sorts of marvelous things. Archie was strongest in developing things; and I think when you got to more of a housekeeping level after something was already going, why then I think Archie had such an active, agile sort of probing mind that he'd like to be out doing something else, and I don't think that continuing management was his greatest strength. But I think we felt that Holly was a good

transition from probably my management style to what would probably come next, and that's why he was chosen.

I know also Cornell wrote the Policies and Procedures Manual. Would you consider that one of his greater achievements?

Gee, that was surely a major thing and Holly did that sort of thing well. He pulled the Policy and Procedure Manual together just like he pulled the specs together. We had a whole lot of memos and notes that were policy and procedure. Fred Merryfield worked on it for some time but it was Holly who finally pulled it all together and made it into a usable document.

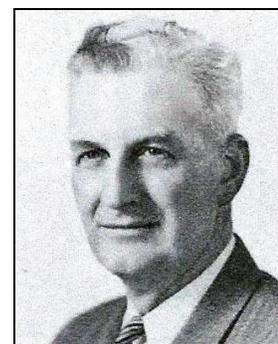
I know when we did our long-range planning—we had an exercise in 1976, I guess it was, while I was Chairman of the Board. In recent years when we had a Chairman, the long-range planning has been his responsibility and it was mine. I was the first person that was not President and Chairman, but, also when I was Chairman, it was not a full-time job; it was full-time later for Holly and for Earl Reynolds. I also was what we called the Director of Operations, all offices reported to me. But I know we did this planning thing when I was Chairman and Holly was part of the planning team. We, about eleven or twelve people, met once a month, starting on Thursday evening, up in Portland and we'd go all day Friday—we took Friday evening off—and Saturday morning. We had an outside facilitator who came in; and we put together a long range plan. When we got all done we needed to put it all together into a document; I know I was struggling with doing it and Holly took it over and, gee, pulled it together into a fine document. That was among the things that he did so very well.

That's a real skill. Anything else about Holly Cornell that you would like to say right now?

Gee, I think I've covered Holly pretty well.

Will you talk about the contributions of Burke Hayes then?

Oh, sure. Burke's contribution had to do with his terrifically analytical mind, his great ability to present things, to make people understand what we were proposing and, I think, if they didn't understand him, he had a manner of presenting it that made them believe what he said was right.



Burke Hayes

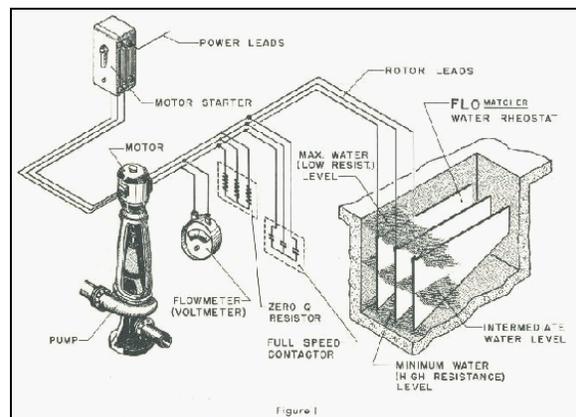
He did innovative things in presenting. I remember early in the game, to present the idea of peaking power to the Eugene Water and Electric Board, why he cut a daily load curve—that shows how much demand for power by each hour over the twenty-four hours. He had that cut out of a piece of wood and then he had Plexiglas put on each side of it, and then it was inverted and he would measure out and pour in heavy liquid that

would indicate the peaking power, and then the base load power from hydro, and the base load from something else, et cetera.

He had great ability to present things. I remember in the early days of the computer, he worked out a demonstration at a water works meeting, I guess, to show how a computer works. He would give a group of five or six people a problem and then each person would do one piece of the problem and pass it on to the next. Of course that is sort of the way a computer does, but, of course, it does it very rapidly. Great presenter and great things. Management was not a thing that Burke did a lot with.

He, of course, developed our technical expertise. He was so strong in the basics that if we had a new kind of problem and we didn't know what the answer was, why, we'd take it to Burke and even though it might not be an electrical problem, he could see an answer, or a way to the answer.

That's how he invented this Flomatcher, a variable-speed pumping arrangement. There was a need. Actually, I think, Ralph Roderick said, "What can we do?



Schematic of Flomatcher

How can we solve this problem—the need of increasing the power as the flow increases and dropping off as the flow decreases instead of the pumps just going on and off." And Burke, with his great analytical mind, saw how to do this with a special kind of wound rotor motor. And, so, basically, he invented the thing to solve a specific problem. It is still manufactured across the river—the Peabody Company, I think has it now. The company has been sold several times; we developed the company and then sold it off; it wasn't best for people who were specifying equipment to own equipment manufacturing.

So, that's Burke's great strength. And also, he knew a lot of people in the Northwest and knew a lot of the power people—well-regarded among them. And Burke, for many years, was on the Board of Engineering Examiners. That's the one that licenses engineers; for a while he was the chairman of it. Through the way that he handled that sort of thing, he made a major contribution to the engineering profession and to the state.

What would you consider his greatest achievement? Was it this Flomatcher?

Oh, that opened doors for us in the early days when people would say, "I couldn't use you as an engineer. I don't want to talk to you." Why, we'd say, "Yes, but we've got something else that might interest you. This variable speed pump." And usually an engineer would be intrigued by it

and it would give us a chance to talk to him. Burke's great accomplishments, I think, are innovative solutions to problems.

To increase the peaking capacity of a power plant we designed up on the McKenzie River, he developed what we call a pumped storage project. It was very different than the conventional one; the way it worked was very economical and it was a good thing. We also had at that particular project what are call syphon spillways. There wasn't enough room for the water just to come up and spill over a dam. We had to somehow get rid of extra water very rapidly when the power station shut down. We had these syphons that pull a vacuum and thus discharge a great deal of water, and he went through a research program that improved how the syphons should be designed compared to the conventional ones. These were not patentable things but they were things that made it a better solution, and gave us a reputation for better solutions. It allowed us to expand our work in these fields.

Great understanding of fundamentals of engineering. Flomatcher sure was an invention that helped us, but as far as the ultimate success of the firm, I think, it's just kind of his general innovative approach to projects. We worked on the Beaver Marsh power project, one of the projects that was to be built on the Upper McKenzie by the Eugene Water and Electric Board. It was voted down by the people in Eugene; they didn't want it because it took the water away from one of the falls. So Burke conceived the idea of taking the water lower down through a tunnel and storing it in another watershed and bringing it back through a tunnel and around a falls that was essentially dry because so much of the water was already going the through the porous rock anyhow. And it was finally built.

Because of his innovation?

He saw the concept of how to do it. Those are Burke's contributions. Whether it was a little thing... I mean some little gadget that needed to be built to solve some sort of a problem, or whether it was a big hydro project, it was his innovative approach to design. I think that was Burke's greatest contribution. And again, you know, all of these peoples' contributions were important and they were able to apply ideas and concepts because they were nice people and got along well with people and so forth.

Are those the kinds of things—like these innovations—that you discussed in your meetings on Monday? Would he have discussed the intricacies of the Upper McKenzie project at the meetings or only with the engineers he worked with?

Oh, sure, in our partners' meetings we'd discuss some of these things but it tended to be more things that had to do with business management, you know: who are we going to hire and how much money we can invest here and there for promotion; whether we ought to put money into a new brochure; and whether we could afford to build the office or build the

addition to it; or how we could split up the profits; and who we were going to take in as partners. Those kinds of things were done at the partners meeting more than technical problems. We tended to discuss project and technical things more with the whole group, and the people who were directly involved with the project.

You mentioned that CH2M owned Flomatcher. Was that Burke Hayes' idea?

Well, after it was developed, the thought was that we would sell the patent to General Electric or somebody like that, but nobody seemed to be interested in it. So we started a company making them ourselves. We had what we called the General Services Company and later on that handled Microfloc which was developed principally by Archie Rice. But we had philosophical business problems with it. If we had a proprietary product like that, there was the tendency for other engineers, our competitors, not to want to use it because they didn't want to do something that would advertise us. Also they would tend to say to potential clients, "Well, you don't want to hire CH2M to do that because you'll just get a Flomatcher pumping station, or just a Microfloc plant." And we tried to lean over backwards when it came to that: in fact, people that used to run Microfloc and run Flomatcher complained. They'd say, "You're not giving us a fair shake." But that kind of thing went on, and so we eventually sold all the proprietary equipment business.

That was a disappointment then to have to sell it?

No, no, no. I think our enjoyment was getting them going and starting them. That was no disappointment; we saw our main job as being engineers on projects. Archie Rice sold General Services to considerable advantage to us financially and that was good. We weren't a bit disappointed in selling it.

Let's discuss Archie Rice's place in the firm. As I recollect, he joined the firm in late 1946? Can you remember your first encounter with him?

No. I don't really remember. He apparently came to our house and I wasn't home and he talked to my wife, Meisy, as I call her. I think she said, "He had a southern accent, asking for you," and my memory was that she said he had a big red dog. But anyhow, although Archie originally came from Portland, he had been in the Army in the South for several years and apparently had picked up a little southern accent. (chuckles) I don't, specifically remember my first encounter with Archie, but he was somebody that Fred thought was important. Fred got him to come with us.



Archie Rice

You had heard about him then before he came?

From Fred. He came back to see Fred after he got out of the Army, and he had an offer to return to work with the state of Oregon. He'd worked with

the state prior to World War II in their sanitary activity. Fred had suggested that he might want to work with us, and so he made him an offer of \$250 a month which I guess is what the rest of us were taking as a drawing account from the partnership. And Archie said, he could get \$260 a month from the state and, I don't remember the details, but probably Fred said, "You know, he's an awfully good man," and so we raised it to \$260 a month, and he came with us. Of course, he made a major impact on the firm.

Wasn't he interviewed or did Merryfield...?

Oh, yes, he came and, no, no, no. He came and talked to us and I can remember this. I remember talking to him and making an offer. In fact, I'm not just sure whether he talked to me, or talked to Fred, over the telephone over this salary business. He may have remembered. I don't remember just what. But, of course, I remember him very vividly as soon as he came with us to work. He came and had this big setter dog and a wife. He came, and went to work and made a great impact on the firm because he had lots of ideas and he had some experience. He had some consulting engineering experience and had done work with the state. And, of course, a tremendously active, capable mind. He knew a lot about sanitary engineering.

What were his major contributions then to the firm?

Oh, Archie made any number of major contributions. One of them was developing Microfloc treatment which really got us the job to do work at Lake Tahoe, and through the Lake Tahoe work and Microfloc, we developed the first really major advanced waste treatment plant in the United States, and actually in the world, of any size that worked continuously. Got tremendous press and publicity from it for a couple of reasons.

One was that it was new in a time when sanitary ecological things were very foremost in peoples' minds, and the other thing is its being at Lake Tahoe; everybody likes to go to Lake Tahoe if you are a nature lover for its beautiful mountains and blue water and everything, and if you're a gambler to gamble. If it had been in Gary, Indiana or we probably wouldn't have gotten so much favorable publicity. But everybody who worked for a water district or a sanitary district heard about it, and of course, they'd try to get their sanitary district to send them to Lake Tahoe to look at it, because that's a great resort area. So we got a lot of publicity and Archie was the one that saw the process as a possibility, developing first through some work that we did at the Hanford works where they have a great deal of water to treat. At Hanford they developed a two media filter bed.

Is that the Pitcon process?

Pitcon, yes. Pitman and Conley. Then Archie got Walt Conley to come join us, and formed, Pitcon; had a company called that at first. And then

through Archie working with Walt, they developed Microfloc. It was a three media filter process with special control of the chemicals, and flocculation and so forth. That, through the Tahoe work, eventually projected us into a nationwide firm from just a Northwest firm.

Because that was such an innovation?

Yes. Such an innovation. That's right. The other kinds of things... Archie was a great advocate of being a corporation, something the rest of us dragged our feet on. But he felt it was the way to go and I think it was because it allowed us to develop our ownership system.

That was his idea?

No. I don't think the corporation was necessarily his idea but he was one of the strong advocates on it. We had always talked about the possibility of being a public corporation sometime. Trying to figure out what would be best, you know. It may not have been Archie's idea, but he at least was one of the strong advocates of it.

Of course, Microfloc he pretty much pulled together himself. The other great thing or another great thing that Archie did was to develop what we call our discipline [matrix] system. When we merged the Clair Hill organization into our organization, why he could see that we were going to have more offices; and about that time we opened an office in San Francisco and we were getting three offices with the Hill organization—one in Juneau, one in Anchorage, and one in Redding. Archie could see that we needed some better system for the technical end of the business so Archie, more or less my memory was, closeted himself and worked it all out and then brought it forth and sold it to us as a way to go.

What was the reception?

Well, the reception was pretty cool to start with. It meant changing the way we had been doing things and, you know, people are resistant to change and some of the things didn't seem quite right. And some of the things, sure, have been modified as you might expect, but the basic idea and the basic organization are the same, and a lot of the basic people that he felt should head up the various disciplines are still heading up the disciplines. This is eleven years later.

But it has been modified. Archie felt, I think, that we ought to centralize our staff more and then have the offices out around but they should be more just sales oriented. I guess some of the rest of us felt that we needed to have more of a presence than just a sales office in these various offices; and although we didn't disagree at all that it would be wonderful to have staff centralized because it would be more efficient, and there would be more interchange between the people and so forth, we didn't feel that you could get the work through just a very small sales organization in each office and in each city where you were. We had to have more of a presence. I think that was different from Archie's concept;

but the basic concept of the thing, and the thing I think that also led to our growth, was Archie Rice's and nobody else's. He dreamed it up and he pushed it through.

He is very persuasive then?

Very persuasive. Tremendously persuasive. A lot of other things that he was innovative on, but those were the big things. The Microfloc, the corporation, the discipline system—the matrix system—were some of the biggest things that Archie put together. He

did a great job, you know, in selling Microfloc to the Neptune people, and then in negotiating the final payment; it was to be a certain number of years and then we were to get paid based on how much profit it had made, and Archie saw the problems with that—that actually to maximize the profit wasn't the best for maximizing the growth of the thing in the long run, so he negotiated a settlement with the Neptune people ahead of time and it worked out very well. So he had great contributions.

And of course, the other thing was that he was well known among the Water Works people and well respected. Archie was a great one for, oh, putting on expeditions. Fishing expeditions and duck hunting expeditions and all kinds of things for both clients and in-house people and for a lot of fun. People liked to do it and it got the firm known favorably and so forth.

One characteristic I noticed in the interview with him was his sense of humor.

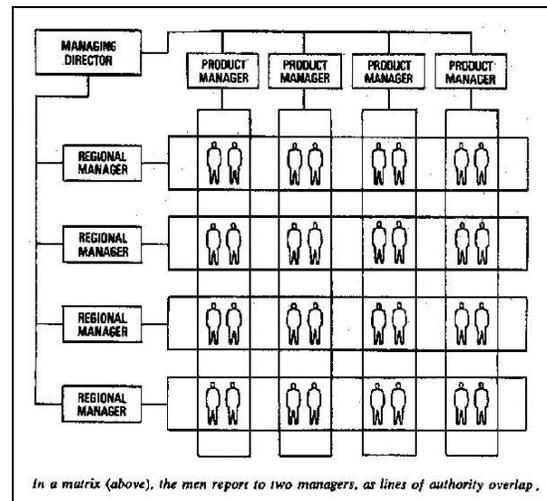
Oh, yes. Tremendous sense of humor. Tremendous sense of humor.

Why don't you give me your version of how CH2M got its name?

Oh, my version. My memory is that Hugh Curren, who was the chief engineer of Eugene Water and Electric Board, thought it up—he said our name was too long—and Burke, I think, supports that, Burke Hayes. But Archie Rice had a feeling that, oh, it came from playing games with letters and numbers like, you know, H2Okg being a waterdog and that sort of thing. So, I don't know.

Well, there wasn't any debate as to what you'd call yourself then. I mean everybody accepted it once Hugh Curren came up with it?

When it came out, except we used it just sort of as a logo, and we didn't think it was very professional at first to use it, I think, as our name. We used it as a logo. But it caught on so well that we used it a great deal later on, and then officially we became CH2M HILL at the time of the Clair Hill merger.



The Matrix System schematic.

It does have a ring to it. CH2M. I like that. Did you ever consider adding the two "Rs" after Rice and Roderick came?

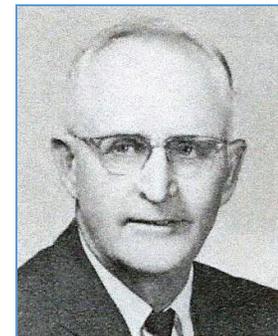
A lot of talk about that. When they came, of course it was Cornell Howland Hayes and Merryfield, and Archie and Ralph said, "Oh, no." They wouldn't add their names. It was too long already. We talked of adding letters or numbers and the feeling was that it would just complicate the thing and we would lose the short, snappy sort of thing.

So nobody had any hard feelings about not adding these names?

Not that I know of. At least, I think Archie and Ralph were very generous and very realistic in that regard.

Well, we've discussed Archie Rice, and I know that Ralph Roderick came shortly after he did. Can you discuss your first encounters with Ralph Roderick?

Well, Ralph Roderick and his brother-in-law, Charlie Bayles, came to see us in the summer of 1946. My memory is that they came principally to talk with Fred. We were in the process of moving from what is now above Andersons Sport Store to above what is now Albright and Raw and Coleman's Jewelry, and we were mostly carrying things down the stairs, and up again. But they came and talked to Fred, and maybe went to Fred's house, I'm not sure. We could use Charlie right away we thought, and he came; and then we felt we needed Ralph very soon thereafter, and he came. He was here for several weeks or months until his family could, I believe, sell their house in Kansas, and then they came out.



Ralph Roderick

Ralph knew a great deal about the consulting engineering business. He'd been a consulting engineer. He'd been a city engineer. Very valuable in, his insights in how to do city work, and do sanitary work and was a great idea person. He was the one that felt that we ought to add or do something about waste treatment with Microfloc, which originally was developed as a water treatment process. And then he would keep after it in a very nice way and see that these things happened.

Was there resistance to using this?

Not resistance per se, but the technical people said, "We just don't see any way to do it, to physically do it."

What did he see that the others didn't, then?

Well, I guess, I don't know. He saw that there must be some way to use the filters and the thing that, of course, made it possible was the development... I guess I've gotten myself down a dead end on that. He figured there must be some way and I can't remember just who all worked together deciding that we could put the wastewater through the

Microfloc filters because the Microfloc filters had greater capacity than the standard filters and then the wastewater went on to the carbon columns which was the only way you could use carbon columns was by having some kind of filtering ahead because otherwise they would plug up too soon. I don't know what all he saw, but he felt that we could do it, and it worked out that we could.

At the time you hired Roderick, was there somebody local or from the Northwest or someone that Fred Merryfield knew who might have been selected? Rather than hiring a man from Kansas, especially when you had to bring him out here with the chance you might not be able to keep him on because of lack of work?

Well, basically, we liked Ralph Roderick because he showed up and offered himself, and in those days, we didn't pay for getting people to the job as we do now. The person got themselves to the office at 8:00 in the morning if they were supposed to go to work and at their own cost. Of course, we'd help them anyway we could in finding housing, and help them get acquainted with the community, but we didn't pay them anything to move to the job. That was up to the person.

So on that initial trip that he made out here, Fred Merryfield was impressed with him just in talking to him and felt that he would fit in with the rest?

And Fred always had a great, great ability to pick strong people. So he was available. The other thing was there weren't very many people that were experienced in treatment plant work and design in the West because there hadn't been much of that kind of work done here and a lot more had been done in the Midwest and the East than here on the West Coast.

We had the large rivers and the waste was just dumped into the rivers and people didn't worry about it, whereas, due to the greater population and I think in some cases a lot lower flow streams, why in the Midwest and in the East they'd had more waste treatment work done. He brought experiences in that, and there weren't very many people out here that were experienced.

Fred Merryfield was one of the first in that field, wasn't he?

Yes. Fred was strong in the theory and in the studies. Fred was not strong in the design aspects, actually turning out plans and specifications. And Ralph was good in that aspect and of course Archie Rice was strong in that aspect.

Out of curiosity, why was Charlie Bayles never asked to be a partner?

Charlie was more the field type person. He was strong in the field work and later on he became an estimating head; whereas somebody like Ralph had the great ability to go out and develop work and carry it through. Those were the people we thought of as principals in the firm. Charlie was an awfully good man, but kind of in a little different area. And that's right,

he was never asked to be a partner. After the incorporation, he became a stockholder.

Can you talk some about Ralph Roderick's contributions to the firm as you look back?

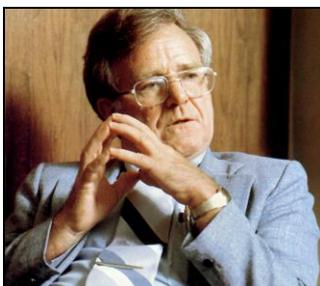
Ralph had tremendous contribution in knowing about the consulting business, knowing how to work with city councils. He was energetic in business development. He'd done business development in the depression years in Kansas and he realized the importance of it. He was very capable in it and just a marvelous person to work with, so people liked to work with Ralph. He'd been a city engineer and the municipalities liked to work with him because, not only was he a fine person and pleasant, but he knew their problems.

The other thing is, Ralph had done a variety of things. In addition to the sanitary work, he'd actually worked on electric systems in Kansas in the Depression years when people were doing any kind of work they could get. He worked on rural electrification—REA—projects, in Kansas for an engineering firm that he was with there. So, he brought experience in sanitary engineering, he brought experience in consulting engineering, and was just a marvelously capable person.

What would you consider some of his greatest achievements?

Well, very early, he headed up our work for the City of Eugene. I guess Eugene was our first, what we considered then, large client, and he headed up that work. He became, you know, very well regarded by the city manager and the city engineers and so forth and he actually helped sell the job. That was one of his early things. Just too many projects so that I don't remember what all projects he did, but he surely did a lot of them and headed them up.

Wasn't he instrumental in the Lake Tahoe project?



Harlan Moyer

Well, yes. He was instrumental in this thing that I've already mentioned, about feeling that we could use the Microfloc process somewhere on the Lake Tahoe project. He actually worked with the Clair Hill people—he worked a lot with them—on the application of the Hayes-invented Flomatcher to some of the pumping station problems in Lake Tahoe.

Oh, while we're doing history, I think the whole Lake Tahoe thing is, of course, a very, very interesting commentary on how one thing hangs on another. We've already mentioned the Flomatcher that Hayes invented; we've mentioned the Microfloc which came from Archie's work. Then, apparently, as I remember the story and there are different versions of it but I reviewed it more recently with Harlan Moyer, the South Tahoe Sanitary District had one of the San Francisco firms working for

them and the district had a one whom some saw as a difficult chairman of its board. A recall election was held, and apparently the San Francisco engineering firm's resident engineer, or some kind of representative, helped in the recall movement; and the recall movement failed and then he was in a very bad situation, of course. Also, somebody on the board had a buddy that was doing a lot of the sewer work, a contractor, and the contracting firm didn't like the San Francisco engineers because engineers made them lay the pipes in accordance with the plans and specifications instead of letting them get by with less good work. (chuckle) So you had that situation.

One Saturday morning they called up and Harlan was there, and they wanted to know if Clair Hill and Associates did sewer work. In those days engineers flew the airplane, and Harlan was a pilot, and he got in one of the airplanes and flew right over to Tahoe that morning. And he got some work to do. Clair Hill remembers it somewhat differently. Bob might have been Dan, Chatfield dropped by the South Tahoe Sanitation District office and the secretary said they had just fired their engineer. From that Clair and Bob went to work on it.

They had a serious pumping station problem. A pumping station had come in way over the bids and the Hill people, from their experience with working with CH2M, knew that we had this Flomatcher system of pumping and with that, why, they saw that a way to save money would be to use this variable speed pumping. It was ideally suited to the Tahoe pumping station it was a very deep pumping station with a big wet well and long discharge line. So they got the job of redesigning the pumping stations and they used the Flomatcher—CH2M helped them—and the bids came in within the money and so that helped cement them with the district.

Then when there was a question about exporting all the waste from the Tahoe basin—of course, nobody wanted the waste—the Clair Hill organization got the studies and CH2M worked with them and put out a report, or reports I think, that involved advanced waste treatment; and then, from that, got the job to design the advanced waste treatment. That was when the Microfloc process was used for advanced waste treatment and, although they had terrible political problems and terrible technical problems, they finally got a treatment plant that worked. It was the first really large one in the world. There had been a smaller one in South Africa and there had been a lot of experimental advanced waste treatment plants.

So this one got in operation and we got lots of good publicity-national publicity in Reader's Digest and others—partly because it was an advanced sort of thing and it was in the age when people were very much interested in waste treatment, but also because it was at Tahoe. If it had been Gary, Indiana, or some place, why there probably wouldn't have been as much interest in going, but everybody liked to go to Tahoe because it was scenic and had the casinos, and any sanitary official or

engineer that heard about it, why, they really needed to make a trip there to see it.

So got lots of publicity and from that, the Virginia Regulatory Agency said that they had to have an advanced waste treatment plant on Occoquan Basin near the Dulles Airport and that the designers of the Tahoe plant would have to approve the plans; so that gave us a great leg-up and Harlan, Sid, and Gene Suhr and some of the other people went back and got the job of designing it. And we set the office up in Reston and from that why we had an East Coast office and we had kind of broken out of the Northwest; and from that and all the publicity, we got work with the Denver Water Board for their reuse program; and really that's the way we became a national firm rather than just a Northwest or a West Coast firm.

That was a turning point in the success of the firm?

Probably a very big turning point in making us a national firm, and it hinged on a whole lot of things. It was surely influenced by the invention of the Flomatcher, the developing of the Microfloc process through Archie Rice's efforts, Clair's contacts and all of these things fit together to make CH2M a national firm instead of a local western firm.

And the only reason you got involved was because Clair Hill and Associates was familiar with your work?

With our work. We'd worked with them for a number of years on various projects.

We'd had a number of projects with them and some projects on which Harlan Moyer had been the project manager.

That's interesting. Back to Ralph Roderick. Why were Rice and Roderick asked to become partners? It would seem that you would not want to divide the profits further?

Well, I don't know just all our thinking; maybe to help hold on to them. We thought they were tremendously valuable people and I don't know just all of our thinking and we didn't want them to go with somebody else. I think also that it was a matter of just feeling that the right way to run a firm is that the people that contributed ought to share in the returns in money and satisfaction too.

All four of you were in agreement that they should become partners?

Oh, we surely were. We wouldn't do anything like that without the four of us agreeing. And initially we had four 25-percent partners and then, when Rice and Roderick became partners, we had four 20-percent partners and two 10-percent partners and then, after a few years, we were convinced that they were so important to the organization that we made the six of us equal as 16 2/3-percent partners. I think that was the spirit of the senior partners. They weren't very senior in age then but they were senior

in the amount of ownership. I think one of the turning points in the firm is the fact that we were willing to do that.

That is so uncommon. With other business, well, take Clair Hill and Associates—Clair Hill was the owner.

Yes. Towards the end of the time before the merger, Clair did expand the ownership. Basically the increase in ownership came out of Rice's and Roderick's earnings in the firm so they didn't have to go out and bring in money to do it. And that's the way we still work; people don't have to come in with money, they get stock as a bonus. So that's been carried on through the corporation; that's the way the ownership of the firm changes now.

Who was behind this philosophy? I mean, the philosophy of sharing the wealth and later on your stepping down from being president. These actions are somewhat unusual.

Inherent in all of the four and later the six people. They just saw that this was the way to do it. And at least so far it has proved to be the right way for people to do it. Because other firms that were a lot larger and more established than we were have not, at least, grown as much as we have. I don't think size is the only measure of success, but you can't argue but what we've grown.

No. It's remarkable.

So I think, you know, it was all the people. Fred and Holly and Burke and myself, and then later on Archie and Ralph, saw this as a reasonable way to go and a pleasant way to do business. If you can make the person's goals and the firm's goals parallel, why then you don't have any big management problems or don't have as many anyhow. And I think that's what we saw as the importance of doing this.

You mentioned that Ralph Roderick had the ability to convince others that something could be done even though others didn't think so. Like using the Microfloc. Can you talk about this quality of Ralph's a little more?

Okay. Concerning Ralph, he had great abilities to keep working on an idea until something came of it, particularly in the Microfloc activity. He felt that the Microfloc process, which was developed for water treatment, could be used in high level waste treatment, high degree of waste treatment. And he kept working on it and getting people to work on it until finally it came about on the Tahoe plant. Ralph was a likable, down-to-earth person, but again, persistent and with vision so that he was able to get things done. People listened to Ralph because he wasn't radical. He was just solid, but convinced that certain things could be done, and if he didn't know how to do them, he'd convince other people that they ought to work on them.

So he was persuasive in making people think that something could be done, even though they didn't think so initially?

Yes, I think that's a fair evaluation.

Were there many conflicts over major decisions between the principals?

I don't remember very many. I think one of the reasons we didn't have as many conflicts as we might have is that we had the good fortune to get quite a lot of work, and we were all so busy doing projects, and that's what we liked to do, that we didn't worry about other things. We were just keeping going night and day getting out our projects, and getting our young families going, so we didn't figure it was important to fuss with conflicts. I think if we'd had a harder time getting started—although we weren't really all that profitable early—but if we hadn't been so busy doing things, then we could have had more problems. And you know the tendency was to say, "Well, if there are management conflicts, well, heck, let a couple of people decide what to do, "rather than take the time from doing a project which you like to do and fussing with the conflict.

Mutual goals then.

Mutual goals. A number of people felt that, with the original four of us, the thing would never last. We had, of course, Fred who was a very strong individual. We had people who just thought Fred was the most outstanding person they'd ever known, and some people didn't like him very well as is the case with any strong person. And they said, "Oh, heck, that firm will never last." But it did. And so basically the six of us had marvelous luck. We were together for over thirty years. Nobody got hit with a truck and died, nobody got a bad disease and died and nobody got mad and quit; and so we were very fortunate.

Part of it may have been due to the fact that although Fred Merryfield was a strong individual, he only worked part-time here?

That's right. And maybe, since Fred wasn't around very much, we just went ahead and did some things. (chuckles) But Fred had great ideas and was a very strong individual, and was very cooperative and pretty much stayed out of the business end of the thing. That was one of our problems with Fred; he never really wanted to talk business with the clients. He'd change the subject rather than get down to signing a contract or telling them how much money it was going to cost. He was uneasy...

He felt uncomfortable?

Yes, he apparently felt uncomfortable.

He always took one of you other people with him when he negotiated a contract?

Well, he didn't do much negotiating of contracts. I remember early times in St. Helens, why, they said, "Gee, we want you to do the work and Fred's great but send somebody down to sign a contract with us." And so a little later Ralph Roderick went down and worked out the fees and signed a contract with them.

Each of you complemented each other.

Yes, I think that's right.

Why were clients attracted to your firm? What did you have that other firms didn't?

One was Fred Merryfield. He had unselfishly given of himself to help improve water and sewer systems and their operation and to raise the sanitary standards in the State. He was well known favorably to a lot of people. Throughout the firm we had very good strong people. Archie Rice and Ralph Roderick and Holly and Burke were all tremendously strong technical people, and they were all people that got along nicely with other people. You know, all won other people's respect. They were all pleasant, gee, in those days, you know, sort of attractive young men.

Still are.

But not so young, and people then and today like to work with knowledgeable, pleasant, capable, young people. I think there had been a lot of not-good engineering done here and in other places. One of the reasons we weren't probably as profitable in the early years is that we were learning; but, boy, we knew quite a lot and our clients got good engineering because we kept working at a job until it was right even though we might lose a lot of money on it.

We might not have known how to run a business so well but we always—well not always, gee, we're human and we made mistakes—but generally we turned out a better job than they got from other people. For example, our specifications which Holly put together. Any number of people copied them. Our system was a little bit different, and I know a contractor came in and was reading these specifications and he thought it was one of our jobs because it sounded like our specifications; he'd bid a number of our jobs. It was another engineering firm and so then the question came up, well, should we complain. You know, this other engineering firm had copied our specifications, mistakes and all. They'd just copied everything. Of course, they had to change the specifications a little but to fit their job but a lot of the general parts were the same. I guess the thing we concluded was well, maybe that is the sincerest form of flattery if they want to copy what we do. And we found people copied our plans for things, and really we never did try to take them to court or anything. Rather than, gee...

Could that have been done? Take them to court, I mean?

Oh, yes. I think you could have done something, because our contract... I don't know, we always thought it was better to spend our time doing our next job than fighting over the last job; and it paid off.

Were there, in those early years especially, any major fiascos or mistakes?

Oh, yes. We had fiascos and we had mistakes and we had misunderstandings with the clients.

The first major lawsuit that we had was, I guess, back in the sixties. An Eastern Oregon Wood Products complex needed more steam and we'd done some studies. The fellow we had had—actually, the engineer, mechanical engineer, he's now retired—but he'd done an awful lot of hands-on work. He'd been educated in England and had come up through a marine engineers system, not the university system, and he concluded that they could save a great deal of money by using some secondhand boilers to generate this steam. For several reasons, he just was unrealistic in his estimates of how much it was going to cost, and several things happened that crossed him up. The union made the boilermakers come out of Portland instead of Eugene, for example, and they cost a lot more; he didn't realize or know how little work the union boilermakers would do per day, and what tremendous costs could be involved. So they moved these boilers out from the eastern U.S. and the costs went way over what we estimated and the lumber company sued us. The wood products company sued us, and we lost. Our insurance company paid for it because the jury felt, or the judge, I can't remember which, sided with the lumber company.

Gee, we had misunderstandings and I don't know, I don't remember. I probably could dig out examples. But, sure, we had our problems. One of the big problems we had in the early days was with our competition. Some Portland consulting engineers tried to get the State Board of Higher Education to say that Fred Merryfield couldn't participate in the firm. And it wasn't so usual here in the Northwest to have engineering faculty people involved as principals of engineering firms; it was very usual in the eastern universities.

Also, one of the Portland banks had a branch here that we asked for credit and one of the principals of a Portland consulting firm recommended they not give us credit. Our competition used to say that the client should not use CH2M because the projects that we got were assigned as classroom work by the engineering faculty that Fred Merryfield did that, and therefore, one just got students doing their engineering rather than professional engineers. So those kinds of things happened and we had to overcome it.

As soon as we got a reputation, we very rapidly got, oh, sizeable operations. Well, in 1949, when we built the new building, which had 3500-square-feet in it, I know the newspaper said it had enough room for our twenty employees so we'd grown to twenty or twenty-two employees. And as soon as we kind of had a presence then people realized that we were a growing engineering firm, and as soon as they got to know us, they knew that we were reputable and did good work. And, fortunately, quite

early in our career we had gotten to work for people like the Eugene Water and Electric Board which were well known as operators of utilities, and that gave us substance and reputation.

Did you use students?

Not to do engineering, no. We used students, as we still do on a part-time basis, summer basis, as engineering aides and what we call technicians. We use them on survey crews, we use them on doing computation work and so forth. You can't take a student and have them head up a project. First, they don't know enough, and then just as the project gets going good, they'd be gone back to school. We do use students. A number of our employees at various places were part-time draftsmen and workers while they were going to school. It's true here; it's true at the University of Washington, Portland State; not so much Boise because the Idaho Engineering School is clear up in Moscow, but they work summers; in Milwaukee, Wisconsin, they have students that come out of Marquette; and so forth.

Fred Merryfield didn't have his students do anything on projects?

Didn't do project work, no, not at all. We did the projects. Even if you wanted to use them on projects, you couldn't do it, and we didn't want to. Sure, we used them as draftsmen, some of them. This was, of course, right after World War II and some of the people were much older than normal college age and were very capable people. Some of them had experience as draftsmen and technicians and surveyors before they were in the military and then they came out and went to engineering school on the GI Bill; and they worked in our office as technicians during the summer and part time.

With thinking back over our time together, it seemed that your description of the things that Fred Merryfield did—like the letter to your then girlfriend, and other things—showed him to be rather nosy and strong-willed and pushy. I was wondering why such intelligent and able people as you three would want to enter into a close working relationship with someone who had those qualities?

Oh, I didn't feel that Fred was nosy or pushy. Sure, he was a very strong-willed sort of person but, gee, a tremendous person. A tremendous man, tremendous thinker and tremendous humanitarian sort of person. He had great concern about people and about the underdog; he'd grown up in a household where his father was a very strong labor person, and they'd perhaps even gone hungry because of his father being out on strike in the times when there really needed to be some social change in England. He had great social consciousness.

And, boy, when he thought something ought to be done, why he got right in and did it. Sometimes, in somebody else's opinion, it didn't need to be done. But the fact that he wrote to my girlfriend showed that he was really concerned about my wellbeing and happiness. I think he felt that I

might be getting into a relationship that would be not good. No. Nosy wasn't the word for Fred, nor pushy, in at least my connotation. Just a tremendous man. He really was. I can remember when we moved into our new house I built the brick walls around it, and even though Fred was very, very busy, he felt that he ought to help me lay the bricks. And he'd come and put the mortar on the bricks, and lay them up ahead for me to lay; and, gee, he'd get way ahead of me and I'd just be working like crazy, so instead of it being sort of a relaxing weekend job, why, it was just hard work—I was pressing because Fred was pressing me. Then he'd have to go off to something and I'd catch up and collapse. (laughter)

So his good qualities overcame these...

Oh, yes. He had tremendously good qualities.

I talked to Norborne Berkeley [brother-in-law to Fred Merryfield]. I'm sure you know who he is.

Oh, sure. Know Norb very well. He's at our house several times a year and we see him almost every Sunday in church and so forth.

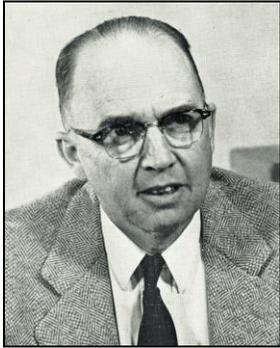
Oh, do you. He's very nice. I talked to him about Fred Merryfield, and he said that Fred had quite a temper. Did that influence you...?

Oh, yeah, not everybody could have been a partner of Fred Merryfield's, but I think he knew that, and I think that's why he was interested in people like Holly and Burke and, I guess, myself. He thought that we were the kind of people that he could get along with.

MERGER WITH CLAIR A. HILL AND ASSOCIATES

Why don't we talk about Clair Hill and the merger with his firm?

Okay. I don't remember just how we got together with Clair Hill, but I know one time Clair Hill was down in Brookings with one of his people, who had at one time worked with Archie Rice, and they ran into each other in Brookings and talked about the engineering firm. The thing about Clair's organization, it was very strong in surveying and did lots of civil engineering work, but they didn't have much in the way of electrical, mechanical, specialized sanitary engineering capability in the earlier days, and in order to do projects, they needed that.



Clair Hill

I think one of the early ones we helped them with was some sanitary work in 1956 for the City of Redding; they hadn't done very many of those types of projects, and I think Ralph Roderick went down and helped them do the study. So we went back and forth. We used them some in, oh, surveying work; not as much as I guess they would have liked. They used us for pumping station design and treatment plant design and electrical work.

They had a large housing project for an air base in California—Beale Air Force Base. They even did the design of the houses and they did the roads and sewers; and we did some of the pumping stations and actually did the reverse cycle heating/cooling for the houses, which was some of the first reverse cycle heating/cooling ever used on, well, government base construction. So it was sort of back and forth. We didn't ever have an agreement with Clair and his organization, but we didn't push for work in northern California on our own. If we heard of something, why we'd tend to say, "Well, gee, why don't they get it and we'd share it."

So then it started back in, I can't remember just when, in the mid-1960s at least, we started talking about merging, and I made some trips down there. I remember going into Redding on the train once—don't ever think about going on the train anymore—and talked about how we might work together. Then as we got the Tahoe thing all put together, there was a tendency for the Clair Hill organization to say that they did the project, and for the CH2M people to say that they did the project, and that confused potential clients. Really it was both. CH2M did the actual design of the plant and the process but the management of the whole thing was done by the Clair Hill organization.

So it looked like there could be some real advantage in taking advantage of our good publicity on the Tahoe work, and also in the fact that we complemented each other. They were strong in lots of things that we

weren't. They were strong in irrigation work, and CH2M was not. So we talked about it for quite a long while. At one time we talked about a four-way merger. It would be Boyle Engineering in Santa Ana, California, and Clair Hill and a fellow by the name of Waller who was a soils expert, and CH2M, and we had several meetings on that; but it just looked like it was too cumbersome and maybe we couldn't get it put together.

So finally we put the CH2M/Clair Hill merger together. A number of people at Clair Hill saw that it could be advantageous. One of them was Harlan Moyer and others in the organization felt it would be good for them and we thought it would be good for this firm. After a lot of going back and forth... (Owing to) the fact that we have a very complicated



Jim and Clair swap stock.

corporation setup because we tried to make it as much like a partnership as we could when we became a corporation, it took a lot of special agreements between the people about who would come in as stockholders and all that sort of thing and how much longevity we'd give them because longevity affects our bonuses. So it took a lot of negotiation and pretty much Mike Fisher and I handled it: Mike, of course, handled the contractual details and so forth, and I handled talking to the people.

So the principal CH2M people were in agreement that this merger should occur?

Yes, we were, by that time, you see, in 1966 we became a corporation, and the merger didn't happen until the end of 1970, but the stockholders agreed. One of the things was trying to work out something that would be equitable and it appeared from our analysis—Mike Fisher did much of it and I did some of it—that we couldn't pay the Clair Hill people as much bonus for a time as we did the CH2M people and still make it good for the CH2M people, so the Clair Hill people went on a partial bonus for a period of time. There were feelings that that wasn't exactly right. We'll never know what would have happened if (we) hadn't done that. You know, it's the kind of thing you think you can't quantify whether it was the right thing or not. But when we got past that five-year program, everybody shared bonuses on the same basis.

And one of the things that I might bring out that I think was one of our great decisions—we made it early with the Boise office—is that we couldn't determine really where profit was made. Originally our arrangement with Earl Reynolds was that he should share in the profits in the Boise office. After a few years, why we decided we couldn't tell whether we made money because they got a job and got a good contract or because they got the job and sent it to Corvallis and Corvallis did a very efficient job, or

vice versa; you couldn't tell where the money was made. So we then arranged with Earl to pay him his bonuses on the basis of the firmwide operation and we've followed that philosophy ever since.

There have been sometimes, when an office is very profitable for a few years, they tend to feel that they should get more bonus than the people that are working in an unprofitable office, but we've never succumb to those arguments and have always paid bonuses firmwide rather than on individual office basis. So somebody who's in a developing office that's not profitable at all, in fact it may be a considerable money-loser, can benefit just as much from the bonus as somebody that's in a great profitable office. We felt otherwise it would be divisive.

You said there were feelings that it wasn't exactly right about the partial bonus for the Clair Hill people. Who felt that that wasn't exactly right?

The people getting the partial bonus—the Clair Hill people.

So they thought that they should get the full bonus?

Yes, particularly after we had been at it for a while; why they said: "Well, you know, we are contributing as much as the other people and we aren't getting as much bonus." They were only getting half. Now, that's for the stockholders, the so-called Key Employee Bonus. The general bonus which is paid to everybody was distributed equally across the whole firm; the combined firm.

It was CH2M's decision not to give them the whole bonus and that caused some hard feelings there?

Yes.

How did you work out this problem?

Well, we didn't change. Basically, according to our figures, it wouldn't have been advantageous for the CH2M stockholders if the Clair Hill stockholders got the full bonus. And one of the reasons we felt that it was possible was because there wasn't a very formalized bonus plan in the Clair Hill organization even for the stockholders. Clair distributed the bonus as he saw fit.

Subjectively.

Yes. And I think it seemed like in order to make it go together from our standpoint, we needed to have the partial bonus thing. It's easy to forget how it might have been or something; you never know how it might have been.

Why don't you talk about Clair Hill's contributions?

Okay. Clair is widely known in California. He'd been head of the water agency down there. He was well known to Pacific Gas and Electric. You're thinking of maybe Clair himself?

Clair himself.

Clair himself. Clair has a great deal of vision in kind of things to come, like photogrammetry, and the importance of irrigation and water use; of course, that was important in California ahead of when it was here. And he was an entrepreneur. He was willing to go out and buy horses and mules and tents to send survey crews into the field where they had to stay for some length of time. Clair was a great one for forming businesses. He had businesses on the side, in addition to the firm. He had set up a computer business on the side which was not a profitable thing. But he was of an entrepreneurial bent. So Clair used to say that he didn't see how we ever operated "running a firm by committee." His was pretty much of a one-man firm; and he ran it. He must have made a lot of good decisions because they had a lot of success. But he pretty well held the reins of the thing which was one of the reasons, I think, that their people were interested in the merger. They could see that they might benefit from an ownership program such as we had. Clair had gone to some spreading of the ownership but not really very much. He'd built an organization; it was a going organization and it had a good reputation; he'd had a major part in the water planning for California and knew the people; he could open doors in California because he was known and helped us get work. Through their contacts and CH2M's very strong mechanical and electrical people, combined we could do major irrigation work. Now we have such people in Redding too.

The merger was a positive move.

Yes. It worked out very well. Clair's contribution was building an organization, and also having the foresight to see that probably it would be best for the organization if it moved into something else other than staying on the route that they were going.

Whose idea was it to add the HILL onto CH2M?

Oh, we had a terrible time figuring out what to do about the name. People wanted to do CH3M. We didn't want 3M because it was like the 3M company and the 3 stood for M there. I don't remember just how we got the HILL into it; it seemed like one way to do it anyhow. And then we had an awful hard time figuring out what the logo ought to look like. I remember everybody had a different idea for a logo. Finally, I believe a couple of us just got together after looking at a variety of ideas and said, gee, it's going to be this way and bang it was that way.

What did the other principals in CH2M think of adding the HILL?

I don't remember their comment on it. We struggled quite a bit. I don't remember there being a great difference of opinion. It was just hard to get something that we all felt good with.

What did Clair Hill think?

Well, he seemed to go along with it all right. I don't know. What did he say in his interview?

He didn't say that. (laughter) It's kind of interesting the way people remember certain events. I think that's the value of this kind of approach because you all are remembering the same incidents differently.

Oh, yes, and I think maybe I mentioned before, that—no, I didn't, but I've been putting together a handbook for the use of the Board members, setting forth the basis for some of our decisions and how we got to our overall operations, and probably there is nobody that I worked easier or longer with than Holly Cornell, but Holly wrote down his impressions and I wrote down my impressions on a whole outline of things, and you'd be surprised how much our memories differed.

I don't think I'd be surprised after talking with you five men. What you have told me is quite different in a number of instances.

I read Roderick's but I haven't read Cornell's or Hill's or Hayes' or Rice's yet, and I'm looking forward to it.

Well, I hope you all read them.

Oh, I'm sure we will. We are very interested.

So you think the name has benefited the firm and it was a good move to add the HILL to CH2M?

Oh, I guess, personally, would have preferred to just leave it CH2M. I think it complicated the thing. I thought that the HILL name would fade out after a few years, particularly after Clair retired. I didn't say, gee, this is just terrible, but I thought that it made it a difficult name and that the HILL would tend to fade out, and it hasn't.

I was under the impression that you were the main person that pushed adding the HILL to CH2M.

(chuckles) Perhaps so. Maybe as feeling that it was important for unanimity and early-day business development in California. My memory is, I felt that it was a cumbersome name as a long-range thing.

So you assumed that people would pretty soon just say CH2M again, and drop the HILL?

There is quite a lot of that that goes on. In Corvallis, if you've noticed, normally when there is a headline about the company, they just use CH2M. I thought it would drop out further, and after Clair had retired and we were well known in California, why, I had suggested to a group of people that maybe we ought to change it to just CH2M, or let it evolve into just CH2M and encourage it. But I couldn't get any interest from the principal people so I dropped the idea.

I see. I didn't realize that. That would take a lot of major changes not only in the stationery, but in publicity and a lot of other aspects?

I think that's why they felt... I thought that you could phase it out over a period of time, but I think the other people felt it wasn't maybe the right

thing to do from either cost standpoint, or some other reason, so we just left it.

So the Redding people liked that idea of adding the HILL? That was the major reason for adding it?

That's right. And also for business development in California.

I know that Clair Hill saw your organization as run by committee. Those were your words, actually. And the Clair Hill organization was a one-man-run firm. Was there any dilemma or conflict with Clair Hill about merging into an organization that was run by committee? And how did he resolve that? Did he plan to change it or was that a point of contention?

I don't know if it was a major point of contention, and I don't know what Clair thought but we took him in as part of the committee. I mean he sat on the Board, and I don't remember that we had any tremendous disagreements with him as a Board member. Sure, among the CH2M Board members we would sometimes have disagreements, but I don't think there was any big unsolvable problem.

He didn't have any plans to try to change the combined firm more in the direction of the Clair Hill type of operation?

If he did, he didn't tell us. (laughter) I didn't sense that he tried to change it. He still continued to run the Redding operation pretty much the way he always had; pretty much had a centralized control.

Did that cause problems?

No, not particularly. However, even today, some people say we can tell which part of the merger a person come from by the way they run their operation.

You mean the people that have transferred from the Clair Hill office at Redding and gone other places?

Gone other places that they still operate more on a centralized, authoritarian sort of basis.

Was there some kind of training they could have had, or should have had?

Well in that organization, as in CH2M, quite a lot of the people came out of school to the organization, and never really worked anyplace else. In fact, that's true of, say, Harlan Moyer who is now the president. He came out of school and, sure, he'd had various jobs and worked in the Navy and so forth, but really, after he graduated, the main place he ever worked was Clair Hill; and you expect that people, unless they think it's real bad, tend to mirror what their experience has been.

So how has the tradition of the one-man idea affected the management of the firm, then?

Oh, I imagine that the people that have moved into other jobs from Clair Hill operate a little bit differently than if they had come from the CH2M

side. But, now we have so many people from other firms from all over, I don't think it has a major impact. Sometimes people say, in regard to Harlan Moyer, "You can sense that he came from the Clair Hill side by the way he operates."

In thinking back, would you say there are ways the merger should have been done differently?

No. You never know what would have happened if you had done something differently.

However, you can learn by your mistakes. So when you merged with the Florida firm, was it done in a different way in any particular aspect?

No I think this is just what's ingrained in the people; I mean, by merger document, or anything, you don't change the people, and I think it's basically a people-thing.

Do you think the merger with Clair Hill & Associates opened the doors to projects in California that CH2M could not have gotten if they hadn't merged?

Oh, I'm sure it did. And, of course, it opened opportunities for the people in CH2M, and it opened opportunities for the people in the Clair Hill organization.

Could you have gotten a toehold in California without the merger, do you think? I know that was one of the reasons why you merged.

Yes. Well, I think we could have eventually gotten a toehold as we've gotten a toehold throughout the whole United States. I'm sure we could have. But I think, if we hadn't done it by the merger route, it would have been more expensive in time and money to do it. I can't prove that, though. If we had taken, for example, all the bonuses and whatever that went into the Clair Hill activity, and spent that some other way in trying to get offices started in California, I don't know. But we started an office in Los Angeles without really a lot of—I think we did have one job down there, but we did it as a merged firm and you don't know just how much one aspect or another caused us to be able to work in Los Angeles. And, actually, the Los Angeles office has been pretty slow in getting going, but it is going quite well right now. And the San Francisco office was slow in getting going even though both Clair Hill and we started that as a joint venture.

HOWLAND' S CONTRIBUTIONS, PHILOSOPHY, AND THE PLACE OF ENGINEERS IN SOCIETY

We've discussed the contributions of Roderick, Rice, Cornell and Hayes and Hill. I didn't ask you what you felt your contributions have been. What do you think your contributions have been to the firm?

Well, I think my contribution probably had to do with something that we really didn't plan— didn't visualize it in the beginning as a place I would make a contribution. I think that it's kind of holding the thing together as sort of a constant force or personality in the thing. As I got more and more into management—and I sort of just fell into it; I didn't aspire to be the manager, and didn't really study to be a manager, but it just seemed it became my role to kind of hold things together as described in, you know, what is Small Is Beautiful, I saw my role as a manager as sort of like holding together a bunch of balloons and seeing that they all went up together. I guess I really didn't think about that ahead, but in retrospect, I think, perhaps that was the thing that I contributed.



Jim Howland

I guess, I'd had, probably from my parents, a pretty strong feeling that you needed to be extremely honest, extremely forthright: you pay your bills; and you just couldn't stand not telling the truth because it would catch up with you if you didn't. I didn't feel that I had all that good a memory. So I think that maybe that—not that the other people didn't believe those things—but I think that the fact that I was one of the people who believed in them strongly, why, that was a contribution to the firm.

I think clients and other people felt that all of our people, all of our principals, had a great deal of integrity, and therefore they liked to work with us. I guess another thing is that by some quirk of nature I like to do a lot of different things; and with that sort of an outlook, why, it made me flexible to take on kind of whatever needed to be done, whether it had to be something that had to do with people, or something that had to do with finance, or whether it had something to do with technical work.

And this is what you mean by holding the balloons together. You were willing to cover these positions?

To cover these positions. I guess you find people, particularly today it seems like, who just want to be a research engineer or just something, just something. I never felt that way. I felt like, gee, anything that was kind of developing something, creating something that could be used, was enjoyable. Therefore, whether it involved writing or whether it involved drafting, or whether it involved computation, if you were putting

something together it was enjoyable; and I think that was, perhaps, why I was happy doing a lot of different things.

You are saying then that specialization is not necessarily positive?

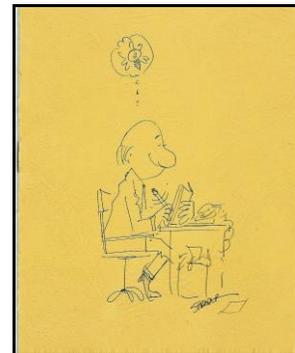
Well, I think it is positive for some people, and people can have very happy lives being specialized. Some people want to do it that way. But I think that the fact that it wasn't my nature to be a great specialist made it possible for me to play this role of kind of bringing the diverse activities together.

How are you passing on this philosophy to the next generation of CH2M HILL employees?

I think the best way to pass anything on is by example and to work closely with people. So if I have any success and these characteristics have merit, and I think they do, why it's by working closely over the years with Harlan Moyer, but even a longer time with people like Earl Reynolds and Jim Poirot, the new Chairman of the Board, and Phil Hall, the district manager for the Southwest, and Les Wierson, the district manager of the Northwest and those people. And, of course, the other thing that I guess I've done is the writing of the *Little Red Book*, which I think I gave you a copy, didn't I?

The yellow book?

The *Little Yellow Book*. First we did a little red book which was called Management Quotations from Chairman Jim which was a takeoff on Chairman Mao—and a title that was suggested by my wife. And then the little yellow book.



The Little Yellow Book

What kind of reception did the book get?

Well, I think pretty fair. Over time, people have sort of said, you know, that's under 85 [item number 85] of Jim's book. And sometimes they kid me; you know, always good naturedly. Recently we've had a resurgence among pretty much the younger people in the firm wanting more copies so we are about out of copies. I think we had maybe a thousand of them printed and they are all out except those that I have in the drawer there—a couple of dozen.

Can you tell me what your expectations were when you produced this book? I recall one point that mentions perks.

That's one point. I guess they (the points mentioned in the book) are just kind of some things that I felt were important in the operation of the firm: the way that the people related to each other and the way the leaders carried on. And, also, I thought when I did the yellow book, and I guess some with the red book, that it eliminated the need for all the effort to put together a gold watch presentation, or a big book presentation, by

somebody else; and I'd get some of my ideas across perhaps and kill a couple of birds with one stone. Now, it didn't work out just that way because at the last stockholders meeting, as a surprise to me, they gave me a very nice kind of scrapbook of my activities which tremendously overstates the case. On the front it says something about "Jim Howland, who really built CH2M, "and that's tremendously overstating the case, because it was a team operation.

Don't many people believe that, though? Because you were in the position you were and are the person you are? I realize it was a team effort, but as you say, you held the balloons together.

Oh, yes, but it's—I've always felt very strongly that the management of the firm, yes, is important, but it's only one of the things that is important. Some people make their contribution by management, and some people make their contribution by sales and promotion, and some people make... And really, although in American industry there is a great tendency for the managers to get what I think is a great deal more than their share of the profits, I see that as just one skill, just only one skill that is needed in building an organization ...

Well it's very important. Somebody has to have that skill but if they didn't have the other people, then that skill wouldn't be of any use. Of course, they argue, "Sure, if we have that skill, then we'll get these other people;" but I think, you know, that CH2M is Holly Cornell and Burke Hayes and Archie Rice and Ralph Roderick, and now people like Earl Reynolds and Jim Poirot and Harlan Moyer and Phil Hall, just as much as it was Jim Howland. So I guess I don't feel I was the one that built it. I was just one of the people that helped build it.

I know you said you ran the firm like more of a family but it has grown so large that that might no longer have been possible.

Of course I stepped down as President nine years ago, I think probably for several reasons: One, that the firm really needed a change—surely, we had been successful but we really did need to have somebody else take over; two, I guess maybe I was a little tired of doing it. To be real frank, I thought it would be interesting to do something else because I'd done that for a long time and, maybe I'd mentioned before, I had worked for the firm for twenty-five years and never had a promotion. (laughter) I thought maybe it was time I made a change. Can't be too sharp if you work that long and don't get promoted.

Oh, come on. Just speculating then, where would the firm have been without you? Would it have even existed?

Well, it wouldn't have existed in this form without me, and without Holly, and without Fred, and without Burke; and really without Ralph and Archie because they were very integral in forming the kind of direction of the firm which took place in the first fifteen years—from 1946 to about 1960. We were the owners; we were the partners. And then in 1960 we started to

expand the ownership. But in those very formative years, why, all of these people played a part in shaping the direction of the firm. So without me, it would have been a different firm. Without Fred and Burke and Holly, why, it could have been a very good firm, or with Archie and Ralph and Holly and Burke or somebody it could have been a very good firm but different. So the firm that did happen, couldn't have happened without me, but it couldn't have happened without those other people, too.

So it was a team effort?

Sure, it was a team effort.

Do you want to say anything else about what you feel your contributions have been?

Oh, I guess, because of my nature, one other thing is an effort to... At least, I feel I don't take myself too seriously and I think that perhaps helped the whole firm not to take itself too seriously. What I'm talking about is not that you don't do everything just as right as you can and everything, but realizing that there is a light side to everything.

How did you get this across?

Just by the way I operated it. The way I wrote the newsletter. I used to write the newsletter.

You mean with humor?

Yes, I'm talking about with humor. A little light touch, maybe. I think that's probably important. But I think the other people had a light touch, too. Archie Rice has a terrific light touch. So I think being careful not to get too serious about everything was maybe a contribution that I could make.

What were some of the more difficult times as you look back over the years?

There is a tendency for the difficult times to sort of fade away. Along about 1965 we had some times when we were not doing very well profit-wise. Actually, we've never really had a year where we lost money but we had some years where we just barely broke even.

Of course, I don't know, we've had great disappointments when we thought we had a profitable job all lined up to go and either we didn't get the job and somebody else did, or it was cancelled. I don't know. It's hard for me to think when it wasn't all happiness. We had difficult times, but we always pretty much grew and even the times when we leveled out, why it wasn't all that bad, I guess. I don't know. I guess I don't have any good examples of difficult times.

No projects that were particularly sticky?

Oh, we had great problems with getting that Tahoe job put together but people of the two firms finally did. Oh, we had people that didn't work out, and we had to let them go and that was always very painful particularly

when we were a small firm. We had a young lady that was stealing the coffee fund money; finally, we put powder we got from the police station on the money and traced it. Those were unhappy times when people had a lot of trust in other people and they didn't justify the trust, but generally, golly, it wasn't all that bad.

Well, what were some of the highlights with the firm?

Oh, gee, some of the highlights mostly had to do, in my thinking, with major projects that we were hired for and completed.

My personal life, why, some of the dock work that we did for the City of Portland was a highlight—industrial planning and dock work. And there was one of the difficult times we had. One of the first major docks we designed for Portland, we got part way underway and part of the riverbank slid into the river, and it was very expensive to get it fixed. We finally did get it fixed and didn't get sued and didn't lose a lot of money over it. Of course, it took a lot of effort to correct it from an engineering standpoint, but I guess we made a case that it was unusual conditions. But we surely worked hard.

In one of my early projects, I had problems with waste sulphite liquor from a paper mill for Crown Zellerbach just upstream from West Linn. Gee, when the thing got partly full, why, again, the riverbank started to cave away, and we were afraid this whole business was to go into the river which would, of course, kill the fish and stop the mill. It would have been a terrible disaster and would have ruined our reputation, but we got in there, and got some equipment and put in some drains, and finally got it stopped. But it was pretty rough.

But some of the work was exciting: Like getting selected for the Tahoe work; getting selected to work on the reuse work for Denver; gee, and the projects that I personally handled when we were hired to design the harbor facilities at Winchester Bay where we designed the sports marina there—that was an exciting thing; and when we were hired to design the railroad that went from the Southern Pacific across, oh, kind of an arm of the Umpqua, and into the International Paper Company mill at Gardner, Oregon. Those were highlights and very exciting times for us, for me anyhow.

Oh, our first major hydroelectric job: we were hired to rebuild the plant at Waltherville for the Eugene Water and Electric Board; Burke and Holly arranged for that.

I think, again, a lot of good things happened. The tendency is, in this kind of a business our things sort of develop, unlike, say, winning a ball game, or something, where "bang" you win or you lose. The getting of a job. Sure, you finally get hired but you keep working on it and working on it and maybe work on it for several years before you finally get the job, and when you get closer to getting it, why, you know that probably it's going to go. The matter of hiring people. When we hire interesting and exciting

people, why, you don't really know how good or how bad the decision is until it's happened for a while. So I don't see ours as one of the great triumphs or great disasters. We've had some of both but they kind of develop over a period of time.

I suppose one of the problems that businesses have is the ability to know when to change and accept new technology and to expand and change management styles. Obviously, your firm has done a very good job at that. Is there one individual or some individuals that had that kind of foresight to know when to move, to change, and to expand?

Oh, again, it was evolution I think that we keep seeing. One of the probably major kind of events along those lines is that, after Holly Cornell had been manager of the Seattle office for about nine years, why, he turned that office over to Jim Poirot as manager, and did what we call a production study to figure out how we really should do engineering. How should we turn out our work? He did quite a study and actually led us into more computerization. Sure, we'd used computers, but we hadn't been very much computerized until he did that, and his studies indicated that this was the way that the thing was going to go and he was very right. So, the senior management all agreed that we ought to do some kind of a study like this and we'd take Holly, who was a very valuable person, out of production to do it. That was a real important milestone. The corporation, the ownership policy, the production study we've already talked about, the Clair Hill merger, the matrix—oh, we haven't talked about the matrix that Archie Rice put together, and the ESOP – Employee Stock Ownership Plan.

What Engineering News Record (ENR) number are you this year?

Well, we were seventh in 1980, and this month they'll come out with the 1981 figures.

What do you suspect you'll be?

Oh, I don't know. I don't know. It depends an awful lot whether you move up or down on what kind of mergers of other firms there have been. But I don't think it is important. I visit the offices and talk to groups of people. Usually I do two brown bags—do one on personnel matters and then one on the history of the firm—on two different noon hours and talk to the people in between. I'll do them in Yakima next week, but I've had people say, "What are we doing to keep in the top ten?" I tell them we're doing a lot of things to expand our horizons, but I don't think that being in the top ten is all that important. The more important thing is that we do really good work and have good rapport with our clients and get lots of repeat business.

You say Holly Cornell had foresight to see the direction the firm should take. What about yourself?

Well, I think we agreed with him. I don't know just who got the idea that we ought to make the production study, but Holly did it. Maybe he got the idea.

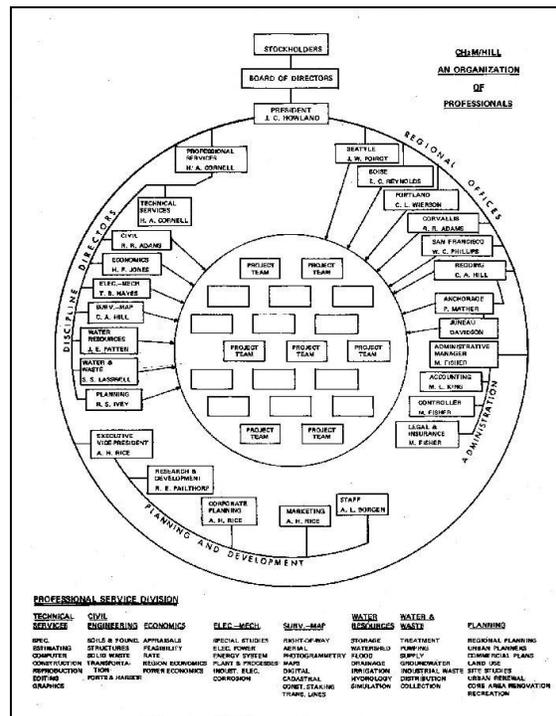
One of the things we did that I thought was important, was that in 1965 we sold off our proprietary equipment companies. We had one called General Services, and it had the variable speed pumping patents assigned to it and did manufacturing. It handled the Microfloc patents and manufacturing. We felt that it wasn't good to be specifying something that we owned, and we were having problems also with it in that our competition wouldn't use it because they didn't want to boost us. Also they would say to potential clients that they shouldn't hire CH2M because they would just get a Microfloc treatment plant or a Flomatcher pumping station. They ought to hire themselves who'll look at all alternatives. So we sold them in 1965.

Archie Rice went with Microfloc. He agreed to be the president for five years. He could have stayed with them or come back, and he elected to come back. So I think those were significant sorts of things.

The fact that we went to a corporation and then extended our ownership policy through the corporation, I think, has been very important to the success of the firm. Then the other thing I think was the matrix. I don't know if we talked about the matrix. Archie Rice came up with the concept.

You talked previously about the matrix system, but wanted to say more.

The matrix, I think, is one of the important things in the success of the firm. As the firm grew and we added offices, we had informal, technical heads. The people that were known for their water work, for instance, why, people would confer with them, and call them, and ask them in to help with proposals and help in getting jobs completed. But as was true with many engineering firms, we were office-oriented as far as the hierarchy went. The people in an office reported to the office manager and the office manager, at that time, reported to the President. At that point we were adding the Clair Hill office in Redding, and two of them in Alaska, and about that time, we, with Clair Hill, jointly opened an office in San Francisco.



The Matrix Discipline System

We were getting quite a number of offices and Archie Rice had the feeling and conceived the idea that we needed some sort of a technical central head in order that we get uniform, high quality work throughout the firm. That we shouldn't spend the money to invent new processes—as people say, "Invent the wheel"—in every office but that we invent the wheel in some office and use it in every office. So pretty much, as I remember, Archie, very definitely on his own, just went in to rather complete seclusion in his office and worked on how we would handle the matter of technical excellence and technical control throughout the firm.

Was he the only one that saw this problem or did others see it also?

Well, I think it was pretty much Archie. I'm sure all of us thought about it some, but Archie really saw it very clearly and he articulated it; I mean he put together a plan. I think he called it a Reorganization and Profit Improvement Plan. He didn't call it the matrix plan. But he put together how we should do it and included some articles out of magazines, or a magazine that he had seen, and presented it to us.

It was quite a change in some respects and of course, we had developed certain resistances to change. Archie was very articulate and eloquent and very convincing and very persistent in applying it, and so we eventually went to the plan. Actually, in his plan, he'd named what the disciplines should be, and we have enlarged the number of disciplines since, but still have the ones that he proposed. And he named who the discipline director should be. For example, they weren't all in Corvallis. He had the head of civil engineering as Bob Adams in Corvallis who is still head of civil engineering, and had water resources in Redding and Joe Patten to head it up, and he is still head of water resources. Many of the other discipline directors have changed as they moved to other jobs. I think Sid Lasswell, who now heads up all of the discipline organization under what we call Technology Director was the water and waste director initially. Now it is Gene Suhr.

But it was Archie's idea. Archie pushed it through. He also, as part of it, had visualized more concentration of the people in design offices. He felt that having our design groups spread around in the various offices was not the most efficient way to turn out work. He was very right in that, I think. The thing that we finally ended up doing was not centralizing to the degree that, I think, Archie contemplated. And, of course, the reason we didn't was that individuals tend to like to build staff in their own office.

Also, in order to get work in a lot of cases you have to have presence, and if you just have a small office in a community, they'll give the work to somebody who has a larger office in that community just because it puts more money into the community and ships less out.

But I don't think the firm could have grown and prospered without the matrix plan, the basic plan. Sure, we could have survived, but Archie could see that it helps us get work. Whenever we're putting a proposal

together, the disciplines get deeply into it and furnish the strong people, both to help put the proposal together and to be named in the proposal as people to work on the projects. And the discipline leaders then go right to the community where the proposals are being made and not only help put the proposals together, but also often appear in the oral presentations in the interviews.

Then I think we do a better job of getting the projects out, like in Alaska. We've had a relatively small office in Alaska because it is very expensive to keep people in there. When we have a job that needed to be done in Alaska, why the disciplines could muster the necessary forces and get them to go to Alaska maybe for weeks or months or whatever it took to get the job out. I think it has been very valuable.

Have there been other firms that have this system?

Oh yes. I think some firms have gone to something like it but have not formalized it and I think the ones I've observed don't work as well as ours does because ours is formalized; it's understood. The matrix is a difficult thing to manage because everybody pretty much has two bosses, and sometimes has more than two bosses. Organizational specialists in business have said it's probably the least efficient method, the most efficient being the dictatorship. But most people and most professionals don't like to work in a dictatorship; and they won't. I think it's been a good system for us and it's worked; and the person that really pushed it and made it come together was Archie.

What was the reception when he presented it to you?

Oh, I think we have a good open group of people, and always had, but I don't think there was immediate saying, "Wow, this is the greatest thing ever." I mean, people had to study it and had to work with it. But I think we very quickly realized that something like this needed to be done.

I'd like to change the subject. I was reading some notes on the engineer's responsibility to society, taken from the American Society of Mechanical Engineers' session back in the 1960's. In the past, you talked about the firm's philosophy. Was economics ever the primary guidepost for the firm in the way it is in other businesses? Can you speak about that?

Well, I think it's not as much a guidepost in our business as in a lot, even including a lot of engineering businesses. I think that all of us have a very strong sense of wanting to do interesting things. I think that we realized, better I think than lots of engineering firms, that you just have to have a strong base economically if you are going to be able to do the things that you wanted to do. If you didn't make money, you were going to go broke.

But there may be a question of conflict between engineering feasibility and public interest in such things as urban planning or land use planning. In cases like that, what is the responsibility of the engineer for the public's interest?

I guess, of course, a great deal of responsibility. Also I think that, in the long range, if the engineer operates in the public interest, he'll prosper too. I think if you don't, if you go against the laws of nature, and if you go against what's good for your fellow man, in the long range you'll pay.

Sometimes it's not really clear cut. Sometimes you don't know.

You don't know what is in the public's interest, just like you don't know what is going to happen in the firm. But I think one of the reasons that we have been able to do what we've done, is that we took the long-range view to decision making pretty much and we set up our benefits to the people pretty much on a long view basis.

The people who benefit the most from the firm through our bonus system are the people that stay with it a long time and make it progress over a long time. Our bonus system is tied to longevity. Our stockholders bonus, the Key Employee Bonus, is tied to longevity. Not anymore, but initially, our retirement program was dependent on the firm being prosperous over the next nine years after you retired. And so I think by having a sense of looking ahead, it was much easier for us to take what would be the public's interest, maybe in conflict to our immediate interest. And I think that part of it comes back to this thing that we all enjoyed doing a good job. Of course what's a good job is hard to tell sometimes when you talk about such things as public interest; we know that you do a good job so that the pipes don't come apart or something. I think, you know, Fred Merryfield had a real sense of long-term sort of things, and I think the rest of us developed a reasonable sense for it.

Has this been recognized as a problem in CH2M, or with engineers? For example, an engineer goes down to South America and wants to build some transportation system, or something like that, that he comes to realize might adversely affect the culture of the people, but whoever wants the engineer to build it tells him go ahead anyway. Would it be his responsibility as an engineer to build it anyway in spite of his belief that the project would have an adverse effect on the culture? That's the kind of question I'm asking. Obviously a situation of that type must come up at times in your business.

I don't think usually these things are black and white. That they will or they won't. But I think it's very important that the engineer, not only honestly report, but advocate making it clear, to the best of their ability what the implications are of whatever they do. Now, you know, you build the big dam and you can't foresee all of the implications of the thing—some of them you can and some of them you can't. But I think an engineer needs to point out the ones they can see to the decision makers that as a result of the project these things that would affect the people will happen, or these things could happen.

What if the decision makers say go ahead and do it anyway even though the project does have an adverse effect on society—the environment, culture.

Do you as engineers have a responsibility to the society in a situation like that?

Oh, I think you do. And I think usually, through design and one thing and another, you can mitigate the adverse things; but you can never be sure that it's going to be all that adverse or all that beneficial. So I think the engineer has a different responsibility. I think if it was just blatantly wrong, then he has the responsibility to say I don't want to be a part of it. But I think that is usually counterproductive. What the conscientious engineer ought to do is work on it, and try to keep doing those things that would make it most beneficial and least nonbeneficial.

I think, in every project, you've got a lot of beneficial aspects and a lot not. You know, you'll get the zealots in some of the environmental areas, who'll say we can't dam up this stream because we've got all these people that fly fish along this moving stream; and that's true. But you have the other side of the coin. You build the dam and you have a great deal more use of the stream by people fly fishing in still water—I guess you can; I'm no fisherman; you would know—and you have all this recreational use, the boating, the sailboats. I dislike the big power boats and so forth and you get those, of course. But you get lots of good campgrounds around the thing, and you get all kinds of things. So you know what is saving the environment? You may save the environment for a few hundred fly fishermen; and you may destroy it, for them but you improve the environment for several thousand people who do other kinds of things—the people in wheelchairs and so forth who can't go fly fishing... so I think there are tradeoffs.

I don't think it's ever, you know, black and white that you're going to destroy a culture or destroy a people; it just isn't usually that way. Usually if there is enough money to build a project, there is money to save the culture through any number of procedures. You can move peoples, you can provide enclaves for them, you can do all kind of things.

Do you discuss this question at all with your engineers, or do you leave it up to them and assume that they have this consciousness when they are hired?

Well, I guess through our various programs, we try to present sort of a broad gauge of consciousness among our people, and I think all our principals, informally as well as formally, talk about these things. We have the environmental scientists and their job is to save environmental impacts or to mitigate them. Gee, those people do "brown bags" carry lunches and they do all kinds of things, talking about the kinds of work that they do in the firm.

We encourage participation in professional societies. Most of the professional societies now have very strong programs to broaden the outlook of engineers; the day of going to meetings where they only present papers on how to hook the pipes together, or make the beam, or compute the moments and the beam, as we talked about, and so forth,

you don't see so much of that in professional societies anymore. You see a lot of this matter of the responsibility in the broad gauge aspects. And I think basically we look to hire people who are broad gauge.

Let's move on to another topic. We didn't touch at all on the merger of the Florida firm. Will you say something about this merger?

I think the leaders in that merger were Holly Cornell and Archie Rice. Both of them knew the Black Crow & Eidsness people through the American Water Works Association. I guess, in retrospect, I sort of resisted doing it. We were having one of our few no-profit years—1976 was a no-profit year—and I felt that probably we ought to concentrate on making what we had more profitable, rather than expanding—I didn't realize it was going to take as much cash as it did in the long run—our management time putting a merger together. I'd been through the Clair Hill merger. I'd been responsible for putting that together. I had a feeling for the great effort that a thing like that takes, even though it seemed like it was very smoothly done. But I also felt that—you know, Holly was the President, and I have great admiration for Archie's business sense, and they pretty much led the overall decision to do it. I wasn't very greatly involved, although at that time I was the Chairman of the Board and of course the Board had to make that decision; but Holly was the President and he felt that it was the right thing. Archie felt it was the right thing. I don't remember ever voting against it, but I wasn't very enthusiastic.

Was it beneficial then?

I think the jury is still out on that. I don't think it's been terrible, but it was much more costly than we had anticipated, due to financial losses in subsequent years. It's been very costly in draining off strong people that we could have used advantageously otherwise in the firm. I feel that it was probably the right thing in the long run.

But you couldn't see that in 1976.

Well, you can have a feel, you can put together the numbers that look good. But I think the reason it was a good thing, and I'm quite sure that's why Holly and Archie felt so strongly for it, was that it got us into the Sunbelt more heavily than we were before. I think it will work out all right. If I had been president, I don't think we would have done it, because I felt that we had a serious problem. We had a year that we had not made any profit, and whenever that happens you've got serious problems all through. You don't pay any bonuses; you've got personnel problems; you've got problems with the banks; and you've got all kinds of problems.

One comment that someone made was that you are conservative, and it was sometimes difficult for you to change or to go in a new direction. Is that a valid comment?

Oh. That probably is, particularly for the people that you interviewed. I have great respect for their judgment and perceptions. I don't see myself

as being real conservative; I see myself as being fiscally conservative. And I think because I grew up in the Depression—and so did the others—but I always like to have a couple of anchors to the windward. But I like to think that I am progressive on ideas, although probably fiscally and financially I'm conservative. I think I've supported things that came up that meant change and going into new kinds of business and so forth, the matter of developing the Microfloc and all those kinds of things.

You were supportive?

I was supportive. Actually, my memory is that I said that I thought that Archie Rice ought to give up his other work in the firm and concentrate his time on Microfloc. I can't remember, I don't think he particularly asked to do that, but I thought he ought to; and he did and it turned out to be very valuable to the firm. I'll be interested to read what the other's say about what they saw in me.

Okay. I am going to ask a question that I realize you've been asked many times, but I'd like to ask it, too. If there is one thing above all others that you regard as making your organization different from your competition, what would you say it is?

I guess attitude toward serving the client.

Attitude toward serving the client. Can you elaborate on what that attitude covers?

Well, the attitude of just doing everything possible to do an outstanding job. That's again one of those degree things, but I know in the early days of the firm, why, all of the principal people were an overwhelming force in advocating that our purpose was to do a good job. The firm wouldn't prosper unless we did a good job, but on the other aspect, it's not very enjoyable if you are doing a bum job on something.

So other firms don't have this attitude?

I don't think they have it to the—again, it's a matter of degree, it isn't black or white—but I think we had it to a greater degree than the other firms. So you've got one thing—gee, it isn't any one thing; I think the attitude towards the job and the people working on the job is a combination thing that was different, and it's caused us to prosper. Now all of these other things, like the matrix, the bonus system, the ownership system, these all come because of the attitude of doing a good job for the client, I guess, on the part of the people working on making it a good job—a good place to work and turning out good work.

And the clients recognize this?

Surely. Because they get better jobs. They get better work. They, the people doing the work, work better.

You mentioned specialization. How has this increasing specialization in the various areas of engineering affected the operation of the firm? Has that

caused a problem? How many different areas of engineering could a firm go into? Can you possibly go into all areas? And if not, how do you choose?

Well, I think in the early days of the firm, the specialists and the generalists were the same people, and we had the good fortune to have people who could specialize in things and who also had a broad look and were generalists. Now, you have some of those kinds of people, but you have some specialists, and are big enough to keep them working as specialists, pretty much. Sometimes in leveling off periods, why you have trouble keeping the specialists busy because you may not have just their kind of work, and so it presents a problem that way.

On a broader scale are there areas that CH2M HILL has not gone into like nuclear energy, for example, and other areas? Can a consulting engineering firm possibly have a varied enough capability to...

Be all things to all people. That's right.

Yes, to cover all the events.

I think you could basically do it. I would think if somebody were willing to hire us as nuclear engineers, we could be nuclear engineers—maybe we would have to add a person—but I don't think we could get any jobs because people are looking for people who have had a lot of experience in nuclear engineering.

So you consciously decided not to go into this particular...

That's one good example. We consciously decided not to go into nuclear engineering. A lot of other things we just kind of drifted into, but this required something of a break. We made very definite studies of what it would take to really get into the nuclear business: What kind of people we would have to hire; how many months or years it would be before we could get a job to keep them gainfully employed. I was going to say we didn't have the resources to do it, but I think we did, but I think we just decided that we could do better expending those resources doing something else. And of course, that was one decision that turned out to be a dandy because, you know, the people who are in nuclear engineering are having a real hard time these days.

Are there other areas that you consciously chose not to go into?

Oh, yeah. Not so consciously, but pretty much anything having to do with telephone communications and that kind of thing, that is one utility that we're not in. We are in water and waste and electricity and gas, but not the telephone communication. We've done some for telephone cooperatives and so forth, but we had an opportunity to acquire a firm out of The Dalles that was strong in telephone communications, and we consciously decided not to go ahead with that because it just didn't look like the opportunity there was as good as someplace else. That may have been shortsighted, because now we have all the kinds of new things like fiber optics that are getting into the communications business, and a lot of

companies are entering that area. Then, of course, it was pretty much dominated by The Bell System. What other areas? Several areas we tried to get into and really couldn't get very much business. For many years, we pretty much stayed out of the overseas business, but we aren't any more.

Do you foresee expanding more?

Well, I think we want to keep the policy we have now—and I've not been one that helped set that policy although I agree with it—that we need some overseas business, but we feel that it would be wrong to make it a major part of our business—you know, maybe ten percent or fifteen percent but not try to be fifty percent overseas. We think that—again, it's a matter of return in quality of life for the people, as well as return in money—we would probably be better off to concentrate more in the domestic market, the U.S. market.

Does CH2M HILL have some special unique quality that makes it work whereas others might not be able to make it work?

Well, yes. I think that's right. I think, first, that we adopted it because we've had an open approach to how we do business, and then I think it works best in a very open system and we have a very open management system.

I think it can only work well where you have a centralized compensation system which we had from the late sixties. The compensation system was really pretty much put together by Fred Merryfield. The thing about it is, if you don't keep your salary somewhat in line, and you keep bringing people together on projects, why then one person could be sitting at one desk and at the next desk somebody else from a different office doing the same job and if they have a great deal of difference in salary, it causes friction.

Whether we want to or not, there are essentially no secrets in the firm—no salary secrets. The way our accounting works, our project accounting, if anybody wants to, they can figure out what peoples' salaries are because the monthly accounting records show the hours worked and the monies paid. And so I think the things that have made the matrix system work for us are the fact that we had a fairly uniform salary system; and the fact that we had a very open management system; and the fact that, although we give the managers of the offices a lot of leeway, we've had a pretty much centralized organization, much more centralized than some of the big firms.

Oh, I'm familiar with a large architectural firm, in fact the largest in the United States—Skidmore, Owings, and Merrill—and I know each of their offices is much more independent than our offices. In the way that things are handled, in the matter of transferring people, and communications, and helping on projects, they don't have much interaction.

As a consequence, of all your interaction is there a tremendous amount of traveling?

A great deal of traveling.

Is that a problem?

I don't know that it causes a problem. Yes. It causes some problems in that people are away from home more than they might be otherwise, and sometimes people don't like to travel, and sometimes it puts strain on their marital relations, and one thing or another. That's kind of a problem. But basically, most engineering, or much engineering anyhow, requires travel; it's expected. It creates a cost problem in some respects. But also it has its great advantage that you get very skilled good people on each project. Otherwise, you couldn't assemble those kinds of people on the project. It seems like I rarely go anyplace on an airplane in the western part of the United States—that's from Chicago west—that I don't end up with another CH2M HILL person on the airplane unbeknown.

On commercial flights?

Yes. Rarely do I end up going anyplace that there isn't somebody else. It seems like every morning we have people going out of Eugene; every day we have people going out of Portland to someplace; sometimes they don't know each other. I was going to Alaska and I was going to drive to Portland then fly to Alaska and then fly back and drive down to Corvallis. Well, it turned out there were several people going to Portland on the company airplane so I got on the company airplane and went.

I was waiting at the gate and a young man and his wife and two children came in and it was one of our Portland people; they were going to Anchorage, so we were on the same airplane. So then I was there and then coming back I thought, "Well, gee, I'll get my notes all written up and everything on the return trip." And, sure enough, John Mayo, who is our manager over in Yakima, was on the airplane coming back from Anchorage. I did pick up a company car in Portland and drove it down here and nobody rode with me on that leg of the trip. But as an example, I didn't know that these people were going or coming from Alaska, and the last time I went to San Francisco I think there were two other CH2M HILL people on the airplane out of Eugene that I didn't know that they were going to go. So we have a great deal of travel. I don't know what our annual travel bill is, but I'm sure it's in the millions of dollars.

Sounds like it might be. It must be very complex trying to keep track of all of these different projects.

It's a complex organization. Complex business.

ESOP, TRADITIONS, THE ROLE OF WOMEN, COMPUTERS, AND OTHER TOPICS

Why don't you discuss the Employee Stock Ownership Plan?

Oh, that's another thing that, actually, Archie pushed very hard. I guess it's too early yet to know just what its total impact is going to be. It was started three or four years ago due to the fact that the laws were set up so it could be done. By giving the employees bonuses in stock, the firm can use that as an expense and therefore it reduces our apparent profit and therefore we pay less taxes. It's set up to be that way by the government with the idea that it is advantageous to have the employees be owners of the corporation. The way ours has been going, it appears that if we make the contributions that we have over the last few years, that in a few years something over fifty percent of the firm will be owned by the Employee Stock Ownership Plan.

This is outside the Key Employees?

That's outside the so-called Key Employees, which are really the voting stockholders—the same type of stock is issued in both the Key Employee program and the ESOP. The ESOP is held in trust for the people and only in very special cases, is it voted, so in the election of the directors and so forth, the ESOP holders don't vote. With practically everybody in the firm owning a little bit of stock, it would get terribly complicated if everybody voted on everything. But it's a main general bonus program.

We have two general bonus programs: we have the general bonus which is paid in cash, often in December, to help with Christmas; and then the Employee Stock ownership Plan which is paid in shares of stock. When the person leaves the firm, they get the shares but the firm will buy them back at the formula price for the next ninety days. There is no advantage for the person to hold the stock because it doesn't pay any dividends so the people get the stock and then they sell it back normally.

What motivated Archie Rice to set up this system?

Well, he saw it as a good way to motivate people at probably at low cost because it reduced our taxes, so basically at least part of the cost of doing it is carried by the government, and that was the government's intent. That's the basis for the law.

He's an amazing administrator, creative person.

Very creative person, yeah. Oh, we'd known about it, but the fellow that really put it together and pushed it through was Archie.

And the reception was positive from the employees?

Has been very positive. So I think it's a good thing; I think it will prove to be a strong thing in the long run. However, at this point, it is a little hard

to tell what effect it really will have on holding the strong kind of people that we need to make the firm go. There are an awful lot of important people, and it's important to keep a great percentage but, as I think in any organization, there are those people who kind of stand out that really make the organization go and if they stay with us for enough time, why they will become so-called Key Employee stockholders. But I think it's important to have longevity in all the people and I believe the ESOP will help us.

One other thing I want to mention is program management like we're doing in Milwaukee. We are managing a very large total program that is costing between one and two billion dollars, and we have lots of firms that are our associates on the project. It may be sort of a wave of the future. Again, we don't know. We've got a program management job in Biloxi, Mississippi and that one is not developing into as big a project, or even as big as we thought it was going to be, due to the fact that some of the organizations have pulled out of this group of sanitary organizations and communities. And then we have one in St. Louis and it's a little different, too, but it may help us move into big projects in the future. The fact that we took on the management of the whole program for the Milwaukee Metropolitan Sanitary Authority, that's kind of another area of activity.

It seems to me and what I've read in your archives, your organization has been a very personal close-knit group. With the expansions and mergers, have you lost that personal closeness?

Oh, I'm sure we've lost some of it. You just can't help that. But I think we've done pretty well. Very consciously I think, Harlan and all of the people have tried to bring the people together and give them a feeling of unity. We actually pay the way of all of the stockholders to the annual meeting which brings about some unity. They are all together, pretty much all of them, at least once a year. Earl Reynolds has tried to go to every office and meet with all the stockholders as well as some of the other people. In this last six months, for example, I've been to essentially every office in the firm, well, approaching thirty offices, and have talked about personnel policies, talked about the general policies, been willing to sit with anybody who wants to talk on one-to-one. So a number of people have worked real hard to keep this unified sort of feeling with the firm. Sure, we can't help but lose some of it with getting bigger.

Do you think that these programs will continue as the original partners retire?

I think the key people believe it is important. And, as I say, Earl Reynolds, who is in the next generation of people, has made a point to try to meet in small groups with all the stockholders, for instance, well, I guess, about every year. I'm not just sure what his schedule is. And I think they will work for a feeling of unity. Undoubtedly, we will lose some of it. We've

gotten to the point where no one person can cover the whole firm, but I think the leaders believe that it's important.

Okay. I, as well as many others, have observed in you five people that in spite of your outstanding qualities—your intelligence, your ableness, your success at what you do—you still seem unpretentious and humble. Not to mention how nice you all are. People in your position usually do not have this humility. Can you discuss and comment on why you think you five, the five I've talked with and Fred Merryfield, have these qualities of unpretentiousness and humility?

I regret that you didn't get to talk to Fred. That would have been a very good thing to do.

Oh, yes, I really would have enjoyed him I think. But can you comment on how it happens you people have the qualities I mentioned?

I believe that it is true we do have such a quality and I think it probably stems from several things. One, I would think that probably Fred Merryfield sensed that quality when he talked to us about forming a firm. Maybe not, you described it as humbleness, not particularly that quality, but it's people being able to get along together. You have to have a certain amount of humbleness if you are going to get along well with your peers. And I think there is something to the thing about birds of a feather; I don't think we would have liked each other and been attracted to each other if some of us had been substandard sort of people.

However, so often power changes one's personality—power and money and prestige. I and others who have come to know you now have done so after you have had all of this success, and you still come up with the same exceptional qualities.

Oh, it's a little hard to know, but I think it's as I say, the selection, the fact that we worked together, I mean we were attracted to each other. I think it has to do with coming from, not humble backgrounds but very middle-class backgrounds, being raised in the Depression, having gone through four years of war, and not having anything very seriously happen to you. All these things are pretty humbling experiences. You don't know exactly and how a person thinks, but as I've indicated, people say, you know, "Why did you start a risky thing like starting a new business?" Well, gee, when we started the new business, that wasn't risky at all compared to being overseas in the military, you know. (chuckles) That is fundamental. You were risking your life; you weren't just risking dollars or reputation; you were risking your blood and your pain. And so I think all those things happened to come together to help shape these people.

Have Harlan Moyer and his generation been influenced by this tradition as well?

Not as much. I think some of the tradition has rubbed off on them; but I don't think they are as much in this tradition, and I guess I can't be sure

that that tradition, to that degree we apparently had it that you described, would allow us to be successful in the changing world. I think one of the reasons I stepped down is I felt that instead of working with small town city councils, we had to survive in big city politics. We've run into it in places like Milwaukee and some of the other major cities where we've worked. It's pretty rough, and I'm not sure that, at least, Jim Howland would have the mental approach to the things that would cause us to survive as well. I think we are tough. I think all of us were fundamentally tough. We didn't back away from hard decisions and we didn't back -away from hard work, but I don't know, at least in my own case, whether I had the type of fiber that would allow me to survive in the political jungle that we find ourselves in, in a lot of places. I think in order to do that; you've got to have maybe a little more ego than some of us had.

So it doesn't concern you that this new generation is not part of this tradition, because you see it as a weakness in this time?

I think we're in a new time, and I think we need to be a little bit different. I guess I have a concern that the new generation, at least in part, and you can't speak for all because each person in the generation is different, but they have a tendency to not be as generous in sharing the results of the firm's efforts with everybody in the firm, and that is of concern to me.

What are you doing about it? Or is there anything you can do about it?

Oh, yeah. Things we are doing about it is writing the red book, the yellow book. Over the last year, I've talked in probably twenty offices about the critical decisions that shaped the firm.

So you don't visualize people as looking back, seeing what it's about, and then just throwing it in a drawer and forgetting it. You think it's really having an impact?

Oh, you don't know how much impact; you'll never know and the people will never know, you see, because all things are made up of thousands of decisions that hundreds of people are making; but if you can just kind of change the direction a little bit, why, then I think it's important. Or stay the direction.

Are there others that are interested in "staying the direction" in the same way that you are?

I think so. Well, one of the reasons that the regional managers have asked that I come and talk to their people is because they have an interest. I don't go unless they ask me to come. It isn't one of these things where you call them up and say, "I'm coming and I'm going to talk to your people next week." It's a matter of Norm Brazelton in Sacramento saying, "Gee, Jim, I'd like to have you come down and talk;" and so then I'd let the other offices in the areas know that I'm going to be in the area and they say, "Fine, why don't you talk to our people?"

You talk about this philosophy that we are discussing?

Of the firm. The critical decisions that shaped the firm and that sort of thing.

What is the reaction? Positive interest? Idle curiosity as to who the H is in CH2M HILL?

No. I guess I've been encouraged that, oh, not always true, but almost every case there have been people standing in the halls. Like in Portland I made one of these talks some time back but, gee, people couldn't all get in that wanted to listen. (chuckles) I was in San Francisco and Sacramento and I don't think there was anybody that didn't have a commitment—you know; people always have commitments—that didn't come to hear what we had to say.

What is going to happen when you lose the energy to do that, or lose the interest?

Well, I think you have a whole lot of people who are interested. You have Norm Brazelton and Phil Hall and Lyle Hassebroek—and I could name any number of other people, of course—Jim Poirot and, of course, Earl Reynolds who is now retired—but these people and then some younger people who are in their thirties, like Lou Licht here in Corvallis who asked me to come and talk to the Toastmasters Club about it; and Sid Lasswell, I think, feels strongly on some of these things; you've got the Bob Adamases; and these people all have a number of years before retirement. And I think the firm has got to change; it's going to have to change because it's got a different environment, but I think some of the fundamentals will stay on.

So it is rubbing off then?

Oh, I think so. I think maybe more by just rubbing off than by anybody going around and talking or writing books.

You mean by your example?

Yes, by examples. I mean all the people's examples over the years. You've got a lot of these people who came right out of school and the only thing that they know is this kind of thing.

That's true.

Not the only thing that they know, but the only thing that they've really worked closely with, is this atmosphere.

Who else besides yourself, has an interest in passing on this philosophy? Are there individuals you can name?

Well, I think different people do it in different ways. People like Holly and Burke don't do it like I do, but they talk to an awful lot of people. They still move around the firm. The week before last the Hayes had an evening dinner and so forth where they invited all of the Swedish people here. We have about a dozen or more Swedish people here that are working with us

and they invited them and they invited people from the firm that work with them. They had dinner parties two nights in a row there were so many of them—thirty at one and twenty at the other. Sure, nobody stands up and makes a speech about the philosophy of CH2M but, gee, in your discussions, in rubbing elbows and so forth, that sort of thing is passed on.

And the same is true for Archie Rice and Ralph Roderick?

Yes, Ralph, of course, has been separated from the firm for quite a while. Archie still, in a very, very different way—Archie has duck hunting expeditions out at his farm, and he brings people from the firm and clients and people together. So everybody operates a little differently. Nobody is probably doing just like I do and that's good because you can only stand about one. (laughter) But people are doing things in different ways. Earl Reynolds, when he was chairman, met not with kind of whole groups as I tended to do, but he had meetings with stockholders. Consciously he went to every office and met with the stockholders, the key people, and talked about all kinds of things. And, again, probably didn't make speeches about ethics and so forth but, sure, talked about things that involved ethical procedures.

Have you ever discussed this with Clair Hill and recruited him?

Well, when I was there two weeks ago, I talked to the regional manager down there now and urged Clair to put together a talk on the background of the Hill part of the organization. I've tried to cover both CH2M and CH2M HILL background but I thought the Clair Hill background would be valuable to them and he said that he would do it.

He would go around and talk about it?

Well, he would talk to the people who are mostly interested in the California offices. And he said, "Oh, yes. I could do that. I could do that very easy."

We didn't talk about why Harlan Moyer was the outstanding choice as President. Could you say something about him?

Okay. My memory is that we had kind of boiled it down to five candidates, to be president. The criteria committee that Holly had put together included some outstanding outside people—John Gray from the Northwest, Jim Ellis from Seattle, plus some inside people—and we had said that we thought that our next president should be from in-house and should be an engineer. So, with that, and through a number of processes, we got it down to five candidates. We had them all interviewed by an industrial psychologist.

What qualities was the firm, looking for in a president? Someone similar to you?

No. Somebody that could make it as successful in the future as it had been in the past, and had qualities to cause people to work together, and qualities that would be viewed by clients as being desirable, and some sort of a track record of management within the firm. So we had the committee of senior people and less senior people and, as I say, we called upon an industrial psychologist, Bob Crisera. I guess that is the first time we had used him. It came down that we thought that four of them would be very good. In fact, all five of them would be very good. We kind of cut down to four of them that would be particularly good, and by a series of elimination we got it down to Harlan—that he would be the best of the four.

It is interesting that he came out of the Clair Hill organization.

But, you know, again, we were evaluating the person and the qualities that they had demonstrated. So it didn't hinge on where he came from other than he had been successful as a manager of projects and successful as a manager of the Redding office, and had these qualities that we were looking of being able to bring people together, qualities of leadership, qualities of integrity. So did the others, but it just seemed that maybe he had the mix that would fit best. And you'll never know what would happen if you had done something different.

Do you want to say anything about Harlan Moyer as President, or his style, or is this something that we don't need to deal with here? How successful is he as a president?

I don't know that we really need to deal with it. I think Harlan has done a very good job. I've enjoyed working with him. I've liked his management approach.

How does it differ from yours?

Oh, more authoritarian. He is less of a shrinking violet; not that I'm a shrinking violet, but he is less of one. I guess, not particularly with Harlan but with all the people, I have some concerns that they—and I can't really put my finger on it—some concerns that they're less directed to the broad spreading of the benefits of the firm at least than the old partners. And maybe in this day and age you have to be different in that.

Broad spreading?

Of the benefits of the firm. Spreading of the economic benefits as well as, and fully important, the satisfaction benefits, the recognition benefits.

Harlan Moyer has this problem?

Well, I say, I think there is a tendency away from the attitude of the earlier people, the Cornells, Hayeses, and so forth.

And this concerns you?

And this concerns me.

And so you are going about trying to resolve it by these talks?

Oh, yeah. And, you know, it's a feeling rather than something you can put your finger on.

Does that have something to do with his management style? That is, his authoritarian style?

Well, I guess I don't say that this is just Harlan. I say I think there is a tendency throughout the upcoming management that is of concern to me.

There were rumors a few years ago in the G-T that your office was thinking about moving out of Corvallis. That was when you were deciding whether you were going to build the new building or not. Was there any consideration given to leaving? And why did you decide to stay?

Oh, I don't think there was ever any consideration of leaving Corvallis per se. Ever since we have had more than one office, we've always had to continually make decisions where you are going to locate people, where you are going to emphasize the growth, actually where people are going to operate from. Earl Reynolds operated out of Boise as Chairman of the Board for however many years he was Chairman—three or four years. And so there was never any consideration of lock, stock and barrel moving out—not in either the desires of the people or that it just doesn't make economic sense.

I realize that this rumor was around. I don't think we ever officially threatened or anything like that with it. I'm sure we didn't. It's a very fluid thing. Our whole operation is one of putting together teams and taking them apart and we move people around a lot. You know, we've got fifteen or twenty people in Alexandria, Egypt, and, again, today probably fifteen or twenty people from Sweden are right here. They are not our people but are working with us on power work. It's a continuous thing of flux and flow, whether you locate some people here or there, these decisions have to continually be made because we have to keep putting these teams together and deciding whether you are going to do the work. We've got maybe a major job in Reston, Virginia. We don't have all the people needed to do that work there now, and we must decide whether we bring people in and do it there, or whether we move the project to any one of a number of offices—whether we move it to Corvallis or to Seattle or to Portland.

Okay, we are going to put some activity in Denver, why then people in Corvallis get nervous and say, "Oh, they are moving to Denver." But maybe the next day, or the next week, we make a decision to put a dozen people in Corvallis. And since we have had offices more in the East and major work in the Midwest, there is a tendency for people that have to be in those locations on a short-time basis to want to be located in places like Denver, because it is just so much easier than having to get up at five-o'clock in the morning and drive to catch that 7:30 plane out of Portland to get to Milwaukee, Wisconsin, so much easier to get there at the same

time from Denver by getting up at the regular time and going to the Denver airport and getting a plane there. I think there is going to be a tendency for the top management people to congregate in—actually, in Denver because that is central. We don't have a Chicago office; besides Chicago is not the center of the country anymore anyhow.

So do you foresee eventually moving the headquarters to Denver or someplace else?

No, I don't. I guess the thing I see is a real major operation right here in Corvallis for the foreseeable future. We wouldn't be spending eight million dollars out here on a new building if we planned to move. Eight and a half million, I guess. Whether "headquarters" is here, that's something else again. The personnel staff is here, and all the accounting is here, and all that sort of thing—is that headquarters? Or, the fact that the President mostly operates out of Denver, is that headquarters?

I see. I'd like to change the subject. What was the reception of women professionals to your firm? Were there any problems in this male-dominated business?

Well, of course, in the earlier days of the firm, for CH2M and CH2M HILL, there were very few women that were trained in the kind of things that basically we were doing—that was in engineering. We had very few support people: did our own editing; did our own—well, every aspect except typing. So as there became more women in the engineering ranks, why, we started to have some women. We have quite a few now. I don't remember of any particular prejudice, of people saying, well, we won't hire a woman engineer. We hired some quite a number of years back. In fact, had a couple of couples where both the husband and the wife were engineers, and we had them in the firm. Not working for each other. We always were sure to have them in different areas of work. I guess I feel as soon as we started having people like editors and that sort of thing, why, generally they were women because they were the people trained in those fields.

Engineering has always been male-dominated. So was there no hesitation about hiring women engineers?

Oh, I guess I can't say that. But I don't remember, you know, of any policy, or any statement saying, we won't hire women. I didn't see any big problem. In 1960, in the United States there were, I think, less than 200 women graduated as engineers out of maybe 40,000 or something like that, 30,000 or whatever. In 1980, there were almost 6,000 women graduated as engineers. Now, as I understand, over twenty percent of the engineering students enrolled in the United States are women. I think they are being accepted reasonably well.

Was Fred Merryfield still with you when the first woman was hired? I read you hired your first woman engineer in the sixties? What did he think?

I think Fred was still active when we hired one of the first. One of the first we hired was Rochelle Dolan. Her husband worked for the firm. I can't remember whether we might have hired a woman engineer before that or whether she was the first.

So they were immediately accepted then by the others

Oh, I think that's an overstatement, you know. Because in something that was as male-dominated as you mentioned, I'm sure that there might have been some reluctance; but I don't ever remember of anybody saying our policy is not to hire women engineers.

Has the firm had any kind of program over the years to try to encourage the male employees to accept professional women? For example, in the Forest Service there has been a reluctance with some people to accept women foresters. They have programs to try to alleviate this problem. Is there something like that in the firm?

We had some interest in the more recent years of women proposing that we have women's programs. I believe that pretty well throughout the firm, the feeling was that that's the kind of thing that ought to be handled on more of an individual basis, rather than having brown bags on how to get along with women professionals and that sort of thing. That really is something that you ought to do on an individual awareness basis rather than having a major course or a major intense program. Back in the mid-to-late seventies, why, several of us who were concerned about this sort of thing set about to have somebody sit down and talk to each of the women engineers about where they saw their problems, and what we could do about it.

Was this instigated by you?

Oh, no. I don't think so. Although I was involved in it. We had a woman engineer in the San Diego office where I was when this was going on, and I remember having the opportunity to sit down and talk to her about what her areas of concern were, and what were her problems, and those concerns were put together and communicated to the president and the personnel director. Interesting enough, that particular case—and she still works for the firm—indicated that her problems were not so much inside the firm but outside the firm.

I was going to ask was there a problem with the clients?

With clients, not so much with acceptance; maybe a little bit of harassment from clients and potential clients.

What do you do about that problem?

Oh, if you think there might be a problem, you try to just avoid the contact, you know. Certain kinds of people are more prone to that sort of thing than others. I guess we didn't think it was a non-problem, but we didn't think that from the viewpoint of the women that—except perhaps in

one case—a young woman in the Milwaukee office who was promoting some sort of a formalized program, but otherwise the ones that at least I had contact with felt that internally it wasn't a big problem.

This question brings up minority groups working for the firm.

Yes, we've, oh, had some good awareness of the importance of handling minority groups, and very early we did something that I think many firms would hesitate to do. In fact, in one particular instance, we hired an ex-convict on a parole situation with the idea that society had some responsibility. He is no longer with us. We had a certain amount of problems, but he worked out reasonably well. I think we've done a great deal in the whole minority area.

Very early we had Asians and Blacks. I think we've had some problem meeting the goals that we might have in the matter of minority professionals, other than the Asians because there are a lot of professional Asians, a lot of engineering Asians. Very capable people. But there just hasn't been a major pool of American Indians, Blacks, or Hispanic people available as technical professionals. And I don't know if we've always done as well as we could have, but I think we made a fairly strong effort. We have, oh, for the last six or seven years, had quite a formalized minority affairs program.

Of recruiting?

Of recruiting and we have had a person responsible for minority affairs for a long time, Willie Loud, who is a minority. His full-time job was minority affairs and equal opportunity recruiting, all that sort of thing. He got the program going pretty well so now he has a split job. He is also what we call a district personnel manager and he still has this minority responsibility. So, I think we have done reasonably well, anyhow.

All right. There is one policy that never came up in any of these interviews with the five of you and that was in regard to the hiring of the partners' children by the firm. Can you comment on this issue? Did you formalize a policy one way or the other?

No, we never really formalized it. We talked about it.

We, you mean the five of you?

We, probably the six partners in the early days of the firm. I know I felt strongly, I don't know if I felt more strongly than the others but the others pretty much agreed that it wouldn't be in the best interest of the firm to have our children as permanent professional employees. For short periods, they've filled in and one thing or another, but not really very much. In my own case, I think our children, had always felt it wasn't a possibility for them to work at CH2M as long as I was a principal of CH2M.

Because of favoritism problems?

Yes. I felt, anyhow, that it's not good for the child. It's better for the child to have made their way on their own. And I also felt equally as strongly, maybe more strongly, that it probably wasn't good for the firm. There was too much chance of people feeling that the child was favored, or from the child's standpoint, feeling that they were really discriminated against. Some people lean over backwards to make it tougher on their own children. And it seemed to me that it wasn't in the best interest of the firm to have the Howland or the Hayes or the Cornell or the Rice or the Roderick children as professionals in the firm. And we carried that on; now it's written. In the early days we talked about writing it and felt that perhaps it was the sort of thing that should be written up.

The others concurred, then?

I think some of the others felt more strongly than I did. I thought maybe we ought to write it into our policies, but the others felt we shouldn't. But I don't think they disagreed with it.

I think it would have been a difficult decision to make, that of not hiring your own children?

Well, you have the problems of acceptance by the other people. Somebody is in a group of one of the Howland children, and the Howland child gets promoted and the other one, why, they are convinced that it's because of their name. I think it makes for a stronger firm to not have the principals' siblings. Probably over time, at this point, I would have liked to have seen some of our children in it, but I think the policy was right. I have a couple of children who are professionals, who are trained in skills that we hire.

Has there been any resentment by the children?

Never expressed it to me, anyhow. I think they wanted to go out and make it on their own, too. At least our children. None of the Hayes's or the Cornell's or the Rice's children were interested in the areas of engineering or science. And it was not until later that we hired very many people who were business types and so forth.

You have one son who is in engineering?

I have one son who is both an engineer and an architect. He works as an architect. I have a daughter that has a doctor's degree in economics and has taught the kind of people that we hire. And I actually have one son who graduated in science although he now is working on a doctorate in psychology.

I see Peter on campus. He is getting a master's.

Yes. He is in the area of political science and geography. We don't hire many of those kinds of people.

So none of them really wanted to come and work for the firm?

I don't think any of them really, you know, desired to. Of course, at this point, they could. We kind of formalized it, that nobody works for the other. So if you are president or chairman of the Board, why, everybody works for you. And on that basis, we didn't hire George Reynolds, son of Earl Reynolds, when he, Earl Reynolds, was Chairman a couple of years ago. He would like to have worked here and we would have liked to have had him. We didn't hire Mark Lasswell. He is a very capable engineer. Sid was head of all of the technical end of the firm. Two major examples.

I see. So now that you have retired...

Yes, Howland children could work for the firm.

We talked about specialization in the different areas of engineering. And I was wondering if the firm hasn't had problems keeping up with the impact of the specialized, sophisticated equipment that has been developed over the last few years? And acquiring the employees with the technical skills to run this equipment? How has the firm dealt with this?

Well, I don't know that it's been more a problem, you know, than any other aspect of running the business. If you go around just, say the Corvallis office, you'll see that practically every aspect of it has been computerized to some extent.

That's a major amount of funds.

Yes, the specifications are computerized, of course; all of word processing is computerized. There are terminals throughout this office and all the other offices, all tied into the same central computers, and now it's a group of computers.

In the air and water laboratory, they have the gas chromatograph, is that the word? Anyhow, it analyzes all sorts of chemicals automatically, and it prints it out on a chart so that it isn't a matter of a chemist going through all different tests. Now they put the material in the machine, and it tells you what is in the compound that you have even to the very trace elements.

We have invested a great deal of money in high technology equipment and we've been able to acquire the people to make it go. Computer programmers, for instance, have been very scarce in recent years, and I'm not sure we've always had as many as we might have, but our computer group is a pretty large group right now. I think we have forty people in it. I think they are capable people so it looks like we've been able to keep up with the technology. We have computerized drafting and that's something that's fairly advanced. Don't have this in every office, you know, but like, for instance, here in Corvallis they have actually five units where people do the drafting by computer rather than drawing the lines on the paper. They have the monitors and they have the whole drawing on one side; then they can blow up any piece of it to any size they want and they can work on it through their sensor equipment; then

they transfer it over into the main drawing and can print it out in just a matter of minutes.

So that hasn't been a concern?

Oh, it's been a concern. But we have continually worked on it, and continually budgeted monies for it, and continually either acquired or trained staff.

Was it difficult for you in those early years to accept the new technologies such as the computer?

Yes. I think, one of the important things that we did in 1969, I believe it was, was when Holly Cornell turned the Seattle office, of which he was the manager, over to Jim Poirot and spent, oh, I guess a good part of a year doing what we called a production study—studying how we do our engineering and how we should do our engineering. We took him off projects; of course he was a very valuable person, but we felt that the study would be valuable.

How did it come about that he was pulled off his other work and asked to make the study?

Well, it came about through the management of the firm. We felt that we really ought to take a look because things were changing so fast. I don't know just whose idea it was, but Holly was interested in doing it and was willing to do it. A new challenge for him, I guess. I don't know if he mentioned it in his discussion but I think that study was very important. One of the things that it emphasized was the need for greater computerization, and I think over a whole myriad of decisions we arrived at greater computerization. We are very heavily computerized now.

So his recommendations were accepted then?

Yes, I think so.

I imagine it would be a difficult decision to put out the amount of funds needed to acquire what then were new-fangled machinery. You had been going along for many years the way you were, without computers, and they were relatively new in businesses.

We kind of eased into it. Initially, we did it on a time-share basis. Actually, when we got into computerization early, we either had a local terminal and you could just pay for the time used, or we would fill out forms and send the things in and then we would get it back in the mail in a day or two. So we kind of eased into it.

I know that the major reason you came to Corvallis in the first place was because of Fred Merryfield but also because of the advantages of being able to maintain close contact with a university. Did the proximity of the university continue to be of benefit to the firm? And was there, in fact, a reciprocal relationship? I know you made use of the university computer for

a time, and the library, and you gave some consideration to students as potential employees and so forth. Can you talk about this?

We have had great deal of interaction with the university. On the computers, why, we've gone back and forth and had a great deal of informal interaction. Our computer people talk to the computer people at the university and vice versa. We've used the engineering faculty as consultants. We've used them in the summertime. In all our offices in the summertime, we've had a policy of trying to have at least equal to ten percent of the professional staff in either upper level students or young faculty people working in the firm. So when an office had thirty technical people, we tried to have at least three university people. And that's still a goal. Sometimes we do not make it and sometimes we have more.

This is to train possible potential employees?

Well, the whole thing. We feel it's valuable to the firm. You get new ideas from the young faculty and so forth. We feel that it is a great recruiting tool. You get the people to know the firm and we know them. We can decide which ones fit best; and they, having worked here, can themselves tell if they will fit in. So I think you have less turnover if somebody has worked a summer or two for you. And I think it's important, from the standpoint of the profession, to have faculty people with hands-on experience, and to bring young engineers up in what we think are good practices. We think we follow good practices.

Is this just OSU or other universities also?

Oh, no. Initially it was mostly OSU because our main body of people were here. For many years Boise had maybe ten or fifteen people, and maybe it was only five or six of those, or seven, that would be engineers; and you get ten percent of that, why, you've got one person, or a fraction of a person; and so in the early days it was mainly here. And we kind of evolved into this thing. Like so many of the things, individual decisions were made that we thought were good ideas, but we didn't evolve it into a policy until somewhat later. So I think it was been very valuable to the firm to be in a university town and I like to think it's been valuable to the university. We've had staff fill in on courses. We've had staff who were the outside advisors to the professional societies—the American Society of Civil Engineers' student chapters and Mechanical Engineers' student chapters. We've always welcomed groups from the university to come and look at what we're doing and so forth.

So the university has been an advantage to the firm then?

Oh, yes, a great advantage. Great advantage in having them here to be able to recruit; and I think we've had, maybe not quite as close but very similar relationships in Seattle with the University of Washington, and with universities in other places.

Somebody mentioned that at first CH2M people thought that they would be able to keep up with new developments in the engineering field with the university nearby, but that really hasn't been the case.

Oh, I'm not sure of that... I think there's been some of it. I don't know whether it's as much as somebody thought it might be, but I think it's helped us to have awareness. You can't tell what rubs off on you, you know.

This person mentioned that because you're not in the hub of activities as the firm would be in Denver or New York or Chicago or San Francisco, you can't possibly keep up-to-date on all the new developments. What is your feeling?

My feeling is that you don't necessarily get in on the new developments by being in one of the large cities. I think you get into new developments by the contacts you make, whether it's in the large city or it's in the small city, through something like the university. I do think that if you didn't work outside of, oh, you know, a small town wherever it is, you know, like Roseburg or something, you wouldn't have the contacts, and you wouldn't have kind of the rubbing off of new things, to the extent that you would if you were next to a university. Of course, I'm a small town boy to start with. I think it's good to be in both places and that's where we are.

Do you think the economic problems in Oregon and the Northwest are affecting the quality of the education here at OSU's School of Engineering?

I'm probably not close enough to it to know. My sense is though that in almost any school they have so much more knowledge available than anybody can absorb in four years, that if the person is the kind of person that is an inquiring person, and a working person, and an intelligent person, they can get a good education almost anywhere.

As you look back over your terms as General Manager and President, is there anything that you would do differently if you had the opportunity to do it over again?

I'm sure that a lot of individual decisions would have been done differently if they had been presented again. But I think overall what we did was really very satisfactory. You'll never know if you had done something different what the results would have been you know. So, as I've said before, it's just like taking pills; you don't know how you would have felt if you didn't take them. I don't see a lot of things that we would have done very differently.

A couple of the other people I've talked with mentioned the location of the firm as being a disadvantage.

Oh, I think in the early days, it was a tremendous advantage because we were basically working in Oregon. I think, people in Oregon sort of looked to Corvallis, with the engineering school here, for engineering expertise. I think we would have had a harder time getting started located in Portland. Some people may not agree with me but I believe that. I think the fact

that we were here, and we were a small firm, and we could serve the cities in the valley which were the smaller type clients was advantageous for us. Now, later on, I think there has been some disadvantages. But I think the way we are organized, we've minimized the disadvantages.

THE FUTURE

In these hard economic times, what is the future for CH2M HILL? More mergers, acquisitions, expansion?

No. I think that in the present business climate we probably ought to just concentrate our efforts on the number of offices that we have, maybe even some reduction in unprofitable areas where we might be, although, I can't think of any. But I think in these times, we need to look very carefully at what the markets are going to be. And I think we have worked very hard at that, like looking at the energy market. A good many years back, we felt that energy was the coming thing, and we needed to be more into it. It's proved out in a lot of the work we're doing in the hydroelectric field now. We acquired a group of coal mining specialists. So I think we just need to look at the types of work that are going to have funds and then get ourselves in position to do them.

I don't see a great need for geographic expansion right now except maybe into some of the areas where the energy work is; Texas being one, Houston and the general Texas area. We might do something to take advantage of where those funds are but we are pretty well positioned.

In Canada the strong economic area is Calgary and we are there. Alaska is a strong economic situation, there has been some cutback but not anything like the Northwest, and we are in Alaska.

The thing I see is, we need to look at what kind of work there is going to be to do, what is going to happen to the sanitary programs and so forth. I don't see a great change in office structure or office locations or organizational structure. Actually, we are doing a lot more things but we are not operating all that much different than we did in the first ten years of the firm. We did energy work; we did hydroelectric work; we did transmission lines; we did sewage work; we did water work; we did bridge work. Sure we've gotten a lot more sophisticated and we have computers and we have all these things, but we're basically in the same kind of business as we were then.

I never thought of it that way.

Yes, and of course a great deal more sophisticated—the projects.

Is there one memorable moment that stands out in your mind over the last thirty-six years?

No. There really isn't. We've been asked that question by interviewers. As you know, we've been interviewed by magazines and by newspapers and so forth and sure, there have been a lot of exciting things. I think the most exciting times are those when somebody actually comes back and says, "Wow, we got hired to do this." Or that. But I can't kind of think of any great breakthrough. It seems like so many things happen to make an

organization click and, gee, it's a matter of just day in and day out. I can remember in periods of my career, of thinking, gee, maybe I'd like to teach at the university because you have the end of the term, and then you'd have a few days off. At the end of the spring term, you'd have a different situation for the summer while with us at CH2M HILL there always seemed to be so many things ahead that needed to be done in order to make the firm go, there was no let up. There were always more things to do than you ever had resources to do, either in time or in money or in people.

Must be very stressful?

Yes. It can be.

How do you handle the stress? A lot of people couldn't handle that kind of pressure.

Maybe it's a little trite, but people get feeling sorry for themselves and, basically, I have to tell myself, gee, are you cold? No, you're not cold. I'm plenty warm. I have a nice office to work in and a nice home. Are you hungry? No. Just really eat too much. I'm a little fat and so forth. Are you healthy? Yes. Really got awfully good health. Sure. Got a cold but got good health. You know. Do you have troubles with your kids or your family? Are they misbehaving? No. The kids aren't. Well, if you can answer no to those four or five questions, you are so much better off than maybe ninety-five percent of the people in the whole world that it is just terrific. You know, so many people are cold, and so many people are hungry, and so many people have bad health, and so many have terrible family problems, and if you don't have any of those things, why no matter what happens to you, or what happens to the business, you're in wonderful shape.

Doesn't it make you wonder why you are so lucky?

Yes. How can I be so lucky? That's right. You know, if we were born in India or born in China or born almost anyplace else we wouldn't be so lucky. Just by a quirk of good fortune, you know, I was born, in Oregon City, Oregon, and had all these wonderful opportunities. So I think that's my philosophy, and I don't think it's peculiar to me but I've surely articulated it a number of times. You know, some people get awfully excited. Wow! Everything's going to go haywire! You can be nearly broke, but if you've got your health and enough to eat, why, you don't have any problems; fundamentally, you don't have any problems.

So this philosophy has carried you through your life?

I think that's carried me, and I think maybe it's helped other people that I have talked to.

You are fortunate.

I think all of the wives of the original partners were always willing to help. They put on the early Christmas parties; they cooked the dinner and everything for all the employees; and they've been willing to help in any way, even up to this day, in entertaining out of town guests and so forth. But they've all been very, very good about staying out of the business. Fortunately, Mildred Merryfield—Mildred was Fred's first wife that died—and later Anne, his second wife, and Cleo Cornell and Ruth—Meisy as we call her—Howland, and then Billie Hayes and Jane Rice and Mary Roderick were all tremendously supportive. I think they were a tremendous asset to the organization.

How can historical information about the firm's past be helpful and useful today?

I feel that it can be useful basically in indicating to the decision makers what things have been successful, and what things haven't been successful; and I think it has a real value to transmit the kind of philosophies that have seemed to have made the thing successful. I am sure there are going to be changes and you can't just do exactly in the nineties what we did in the sixties; but people haven't changed and if you can document some of the approaches that have been successful, why, I think it's very helpful.

As I think I mentioned before, the thing I've been doing is this series of talks about the significant events that shaped the firm. Actually it was requested a year and a half ago in Gainesville. I talk about significant events and their background and it seemed to be well received, and so I've done it in about thirteen or fourteen of the offices since then. I think it's helpful. And maybe if you think it's worthwhile, I would just kind of mention what they are. I won't elaborate on them because I do this in a forty-minute talk.

Sure. I'm interested. Go ahead.

I think the kind of things I mention are one, of course, the decision to put the firm together and that idea came from Fred. The second thing was the including of Burke Hayes who was not a civil engineer—he was an electrical engineer with some mechanical background, which opened up whole new avenues to the firm and kept us from being just a street, foundation, sewer outfit—opened it up to something much more sophisticated I guess you might say. The fact that we brought in two strong people in Archie Rice and Ralph Roderick and made them equal partners, I think that set a pattern—we didn't initially make them equal partners but in a very few years did, and for a good many years, we shared practically everything alike; we all got the same salary until later after we had gone through a lawsuit and one thing or another and they decided to give the president ten percent more, but other than that, why, we always got the same returns. And, of course, it was very significant that we were able to stick together for thirty years; nobody got a dreaded

disease and died, and nobody got hit with a truck and died, and nobody got mad and quit— I think that was significant.

Have many people heard of Ralph Roderick and Archie Rice in these talks you give? Obviously they've heard of Cornell, Howland, Hayes and Merryfield and Hill.

Well, anybody that was in the firm up till, oh, about three years ago when Archie retired, knew Archie quite well. Now, Ralph retired several years earlier than that (1970). Anybody who was in the firm up to that time knew him very well because Ralph was a very important force. Archie was a very important force.

The matter of the Boise office: Earl Reynolds wanted to go to Boise and we felt that the sanitary opportunities were there because the laws had been enacted in Idaho later than in Oregon; and that set the pattern for expansion. Originally we had an arrangement with Earl that we'd share the profits of that office with him, but we soon found out we couldn't really tell where profits were made; and therefore, we went to sharing the profits on the whole firm with him and that set a pattern that we followed throughout the firm. I think if you divide profits, say, on the basis of individual office profitability or individual departments it is divisive. We went to a firm-wide profit sharing system coupled with keeping everybody informed.

I think the inventions were very important: The Hayes Flomatcher invention and Archie working through on the Microfloc opened doors to us; those two led to the Tahoe work which made the firm a nationwide firm; further expanding the partnership in the sixties.

Then the fact that we elected to sell the proprietary equipment companies; we had two equipment companies, companies that made the Flomatchers and sold Microfloc, and we felt that wasn't in the best interest of a professional firm.

The incorporation was important. One of the reasons that I think it was important was that it allowed us to expand the ownership program; we had already gone to an expanded program, but incorporation allowed us to move it ahead and formalize it.

I think the fact that CH2M had none of the children working was important. The production study was important. The Clair Hill merger was important. The fact that we went to the matrix which Archie Rice put together was very important.

And there are things we have yet to see what their importance will be that I think they will be important. One is the program management concept that we are using in Milwaukee and Biloxi and St. Louis and now on the Superfund. I think the BC&E acquisition will become important. And I think going to an employee stock ownership program will prove to have been important.

How do you think these oral histories are going to be used?

After you had done Ralph Roderick's we got the partners together and talked about this, and we decided that probably the first step in doing a history would be to complete these oral histories and then, with those as a background, perhaps we would commission somebody, or take somebody from within the firm, we didn't know what, to put together a history. A history not so much describing what went on, with anecdotes, humorous or otherwise, but basically a history of what happened, why it happened, and what the results were. We think that can be valuable to future people in the firm.

Are you the main force behind this? You were the one that contacted me.

Well, I sort of got it started. I don't know just who all was the main force but I think we all agreed that it had some merit.

One time you mentioned that you were thinking of writing the history? Are you still thinking of it?

Oh, I don't know. I don't know if I have the capability to analyze it and to write it as well as somebody else we might. I don't know what the answer is to that. The thing that we have done, and I don't know if this oral history thing spurred it or not, but we've put together a Board of Directors Handbook. We set about to have it fairly short but basically went back through this matter of how we got to where we are and the basis for it, and why we did it really. This was really just a draft; we got it put together for the Board meeting in March and we'll have a new draft out for the June Board meeting. It has been distributed to the Board members.

Who wrote this?

I put it together at the request of Harlan Moyer and Earl Reynolds. I put together an outline that Archie and Holly reviewed and corrected and expanded and so forth; and then from the outline Holly dictated, without any major research, everything he could think of about the topics in the outline; and then, with his dictation, and wherever I could get knowledge from some research, why, we put together this first draft. But when we complete each section we send it out to Holly and to Archie and to Burke Hayes and Earl Reynolds and Harlan Moyer, and some sections we sent to Jim Poirot and others. So we are now trying to get their comments back. Sometimes they don't remember the things quite the same as the rest of us remember it, and we try to research it and see if we can find something in writing. I believe I mentioned this the other day when I was talking to you, the fact that Holly dictated what he thought and I reviewed it, and although I always thought we had a marvelous relationship, we remembered things differently.

Do you want to say anything else about the firm?

I don't believe so. I think, I concluded before, I hope I did, by saying that it's been a wonderful experience and I consider myself tremendous

fortunate to have had an opportunity to work with many people that I haven't mentioned. Well, of course, throughout the history, the starting ones and the early key ones were Holly and Burke and Fred and Archie and Ralph, and then later on Earl Reynolds and Sid Lasswell and Bob Adams and Fred Harem and Bill Watters and Wayne Phillips, although Wayne Phillips retired a number of years ago, retired quite early—had some health problems. But a lot of other people have come on, people like Jim Poirot, Lyle Hassebroek and Phil Hall and Ralph Peterson. Some of those people have been tremendous, and I really appreciate the fact that I have been lucky enough to have worked with them.

I can't see how you juggled a very busy, demanding job here with your social schedule, and civic duties. You were voted Citizen of the Year this summer. Isn't that correct?

Well, I never did get to be a First Citizen, never was elected. We were nominated. This was kind of a special Helping Hand Award that we were named together for.

How have you been able to juggle your time? I can see how busy you are. Most of us aren't as busy as you and yet we can't handle all of our projects.

I don't know. Again, of course having good support at home has been of great help. I guess having really more interests than I can handle is good. I like to do a lot of different things. Of course, I have a tremendous interest in anything that has to do with construction or getting ready for construction; I like seeing a business go together. I do have an interest in art; I'm not much of an artist but am something of an artist. And of course, I like active sports; I like to play tennis, and I like to swim, and I like to backpack. So it's just that I've had good fortune to be able to compartmentalize my life a little bit.

I don't like to do a lot of the things that probably take time, not through any great direction or anything. I don't like to spend a long time at parties. I like to go, and I like to mix with the people but some people, gee, they'll sit in a bar from 8:00 in the evening until 2:00 in the morning, you know; about 8:00 in the evening until about a quarter till 9:00 is all I want to spend. I'm ready to go on and do something (chuckles).

I have the good fortune, to have a pretty strong constitution. Fortunately, I like to eat the things that apparently help me to best operate. I don't like coffee; I have no religious or physical reasons not to drink it. I don't much like liquor, but I love milk and ice cream and berries, and so I think those kinds of things kind of help a person. And again, it's not by any great design, it just happens that's the way I'm constituted.

I don't like to sit in front of the TV so I guess that's why my outlets are other than those things that take up considerable time for many people. And, of course, I've been extremely fortunate, lucky.

Last week when I was in Seattle after I got done talking about the firm, one of the people said, "Well, how did you happen to start this firm? You people. Engineers, usually by nature, don't like to take those kinds of chances. Why was it different?" And I said, "Well, undoubtedly, it had to do with the fact that Fred Merryfield really conceived the idea of a firm back when we were students, but I think we were willing to take a chance because practically all of us that started the firm had been in really very dangerous situations in World War II. And, boy, anything that we would do at home, in our eyes, had practically very little danger compared to the things that we'd been through.

Holly Cornell was with the engineering outfits that crossed the Rhine on the Ramagan Bridge and was there when it fell in. This was when Patton's forces got across. The Germans didn't get the bridge blown up and he got across and they had a bridge head on the other side of the Rhine which greatly speeded the end of the war. And Holly Cornell was there; he was with combat troops.

I was in the invasion at Saipan and was there while the battle was still going on; I really wasn't ever in great danger but with so much miscellaneous metal flying around, you are always in some danger.

Burke had been with a battle fleet in the Mediterranean, and Fred had been in New Guinea in all kinds of difficult situations. And, again, I'd been gone for four years after having been only married for six months. So I think the feeling that anything that would happen would be better than what we'd been through. The fact that we were all in World War II, one way or another, might also have been a factor in our attitude towards the business and towards starting something new. And I think, even though we hadn't had all that much experience, we had a lot of confidence in ourselves that we could.

At least, you weren't going to lose your life.

We weren't going to lose our life like we'd already been through. So I think that's an effect. I hadn't really thought about that much until the question came up.

Good observation. What are your goals for the future?

I'd like to do certain things in the firm. I think our internal communications need to be better. We can do a better job with slideshows and internal newspaper and that sort of thing, and I'd like to be a part of that for a few years. My wife and I, thinking that I was going to be part-time the first of this year, and although that hasn't worked out, why, the middle of last year, we got to studying what things might be done in Corvallis that would be interesting. We formed a little company and brought a young man, Kent Buys, aboard who had experience doing different things like putting the Old World Center together. So we finally decided we'd go into kind of an art complex, and we had a dream of an art

gallery and a frame shop, which we already have down at the Old World Center.

One last question. Do you think you'll ever retire from your firm? Completely. Be separate from the firm?

Oh, there has to be a time unless I get run over by a truck right off or something. I think I can let go. I may find it harder than I think. But, because Meisy and I have a number of other things going on and always seem to not have enough time to do all the things we want to do, why, I don't think I will have any problem, as long as I can keep my health. I am very healthy now except for some very sore ribs I got from playing volleyball on Sunday. Ran into Dave Livingston, from the firm.



Jim and Meisy Howland

(laughs) We crashed together. But as long as I stay healthy I think there will be some things for me to do for a number of years in the firm, but I think I can give it up.

For me it would be very difficult to retire if I was in your shoes. You've invested so much energy for so many years.

Well, the thing that makes me think I can was that I gave up as being President or Chairman of the Board—I like to think and I'm pretty sure I didn't get forced out—and I think I was able to give that up without any withdrawal symptoms. That was my idea.

Why would someone do that? You had prestige and power?

Oh, yes. But the power and prestige I guess didn't mean that much to me. And I started a job here doing what I liked, working with nice people and doing interesting work, and it seemed like I'd been at it long enough, and maybe my style of management probably wasn't what the firm needed at that point. It needed something different. I'd run the thing— shouldn't say run it because we all ran it—but on sort of a family folksy basis and I think we'd gotten too big for that. And I guess I felt that.

Do you have any remorse?

No. I didn't have a bit of remorse. Oh, when I went to San Diego probably just had a little twinge. I remember writing a memo saying that I'd like to serve on the Board of Directors, but I don't have any desire to serve on the Board again at this point and I'm very willing to go on part-time as soon as Harlan names my successor. In fact, I'm looking forward to it. It just seems like, for the last couple of years, I've just always had too many projects ahead of us.

Firm or personal projects?

Both. Got a whole series of things that ought to be done right here. And I've got a whole series of things at home that I want to do. But, as I say, as long as I can keep healthy and play a little tennis and do a little backpacking and do a little art work, why, I think I can be very happy.

Would you like to say anything else? Have I missed anything that you wanted to say?

I don't remember what all I've said. But I guess that I consider myself so tremendously fortunate to, one, marry the girl I did and two, to have been associated with Fred Merryfield and Holly Cornell and Burke Hayes and Archie Rice and Ralph Roderick and a lot of the other people, too. It would make too long a list. Of course, Earl Reynolds and Bob Adams and Fred Harem and Bill Watters in the firm, and of course a lot of people in the community. I can hardly express how lucky I consider myself to have been, you know. So many things could have happened differently and it's been, gee, extremely fortunate to have been associated with those people, and therefore I just consider myself a very fortunate person.

Can you give the rest of us any advice about how to be as fortunate as you?

Gee, I don't know. Really, I've no license to preach. (chuckles)

I guess, in everything a person does, if they can be very, very open and very, very honest—you have to have such a good memory if you aren't honest, and I don't have a very good memory—oh, and kind of forgiving of other people, why I think a person can have a happy life. Again, you have to have a certain amount of luck. Some people get hit with terrible diseases and terrible accidents and so forth. I don't know how you get good luck. I think that's probably enough.

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