

Charles C. Reed Memorial Lecture

Charles C. Reed: His Accomplishments and Impact on the Perfusion Profession

Aaron G. Hill, CCP
Toano, Virginia

VICE PRESIDENT FRAZIER: My name is Tom Frazier. I am the Vice President of the American Academy this year. It honors me very greatly to be able to welcome you to the Special Memorial Session this afternoon.

I would like to start out by just telling you that it gives me great pleasure to stand before this group to introduce our speakers. This day I am honored to bring before you one of the very cornerstones of this society. On a personal note, my first encounter with him was some 30 years ago at a small regional meeting in Washington, D.C. I am sure that he has no recollection of this, as he was being watched and I was just an observer. But my first impression was that here is a smart guy with a briefcase—he sat at the front row table, he wore a sharp blue sport coat, looking up at the podium with that relatively long block of flowing hair of the Seventies. I was just a kid myself, fresh in the profession. At that moment I began to form the mental model of the professional that I wanted to be. I thought, you know, I want to be like him: Intelligent. Articulate. Good looking. And energetic.

[Laughter]

VICE PRESIDENT FRAZIER: I soon discovered that I was not gifted with his tool box. Gosh, he even had personality, too. Of all these qualities, it was his energy that I remembered most. And as a cornerstone of our society that energy has fueled the growth and development of our organization.

Our speaker, who really needs no introducing, comes to us from the Medical College of Virginia in Richmond, Virginia. Please join me in welcoming this year's Charles C. Reed Memorial Lecture speaker, our beloved Aaron Hill.

[Applause]

MR. AARON G. HILL (Toano, Virginia): Thank you, Tom. I have never been described as a cornerstone, but I will tell you, I am beginning to look like one.

[Laughter]

MR. HILL: As time goes on, everything is affected by gravity. I have the furniture disease, and

you of course know what that is. Your chest falls into your drawers. Anyway, I am giving the Reed Lecture so I have to give the Charlie Reed kind of responses. I will get a little more ribald as time goes on. That particular meeting that Tom and I went to, I remember it very well. In fact, I have a picture of one of the people who was at that meeting. Tally showed up for breakfast in a sheet. That was it. But so it was with the society at that time. Things were a little bit different than they are today.

This is a very difficult job, to try and describe Charlie Reed. We felt here in The Academy that it was time to just talk about Charlie. Normally the Reed lecturer describes their situation in a particular foreign country, and we have done a lot of countries. But I think it's time to remind everybody what Charlie did, what he was like. A lot of us knew him. But not unlike a diamond, he had so many facets. Charlie was just so many things to so many people, and depending on how you view that diamond was how you would see Charlie, so the color of the brilliance might vary from individual to individual.

One of the things that we do know, Charlie was a complex individual. He was born in 1936 in Arkansas. He died in 1990, very early for such a vigorous life.

He was President of AmSECT 1973 through 1975. Let me stop here before I advance too far and just kind of give you some of the early years. I at this point would like to thank a lot people I have talked to about Charlie, because I remember Charlie one way, somebody else remembers him another way, and I have tried to compile some of those things. I would like to thank many of you present in the audience today whom I have talked to about Charlie. And you all had your special stories. Some I can tell, some I cannot, for many different reasons.

Charlie was colorful if nothing else, but he certainly was all of those things. His sister says that he had so much charm he could charm the birds out of the trees. I had never heard that. It must be a Southern expression. But they said that Charlie was a charming guy.

She also remembers that he was quick to judgment because, on one occasion, as younger

sisters will, she was bothering him. One time he was on the phone, so he had BB pistol and shot her right in the butt. She went off screaming to her mother, in which case their mother said, "Oh, Charlie, don't do that." The sister thought, Charlie's getting special treatment.

Well, his father was a physician and Charlie came from very strong stock from a mental capacity standpoint. But his father died when Charlie was 15, so it explains some of Charlie's enthusiasm, the wherewithal that Charlie had. Some of his early experiences. He was an accomplished pianist. He took lessons for years and years. His piano teacher would always have Charlie go last. And why? Because he was the best. He never could read music well. Now, of course, you are not going to play piano without being able to read some music, but he played by ear. His teacher would bring in recordings and he would listen to them and reproduce the recordings. Just absolutely amazing.

He always had a great interest in the outdoors, in shooting and hunting. We will get more into shooting later. One of the things that he actually did was competed in the Arkansas State Championship for Skeet against the good ole boys. That means the adults. At 14 years-old he won the state championship in skeet. Pretty impressive for a young man. Charlie just did so many things so well. In talking to his sister, Linda, she said he was never at a loss for words. That seems to always be true, although Charlie was not always verbose.

I talked to another friend of his, George Cate. The name may be familiar. He was the executive director for AmSECT for a number of years. George grew up in high school with Charlie. The first time he met Charlie they had an organizational meeting for a football group, and they had three schools that they were putting together. These guys are pretty powerful guys. Charlie, of course, was quick to temper and this was evident early on. George said he looked over on the other side of the room and all of a sudden there was a brawl ensuing. These guys were just standing around waiting for the coach to show up. Well, Charlie was right in the middle of it. If there was action, Charlie was always there. And if there wasn't action, after he got there, there was more action.

Charlie was always at the center, and in this particular case, George asked one of the other guys, "Is he fighting with one of the guys from one of the other schools? They have a rivalry?"

"No," he says, "that was one of his teammates."

So, Charlie, if nothing else, held everybody to very high levels. That included his students. That included his staff. That included his friends. And he could be tough on you. Charlie and I did not always

agree. I think that is true with any individual, but especially with Charlie because he had very strong positions.

Charlie went on and started college. Let me just go ahead and go through his credits here for a little bit and we will move on to another one. President of AmSECT, 1973 to 1975. He was a founder of the American Board of Cardiovascular Perfusion, 1975, and he was a director and officer, as well. President of the AACP in 1983, and, obviously, Charlie was one of the founding members.

The medals that we wear, Charlie and I were in Paris, and I was trying to remember if Richard Chan was along as well, and we collected a whole bunch of medals because we wanted to figure out something that we could have that people could wear. I still have that whole collection of all the World War I and World War II medals that we looked at as something for a model. Charlie was always inventive and he was a visionary.

Charlie was an Assistant Professor at the University of Texas 1983-1985, when his school became part of UT. He authored 11 books, three of them textbooks and eight books of poetry. He authored over a hundred plus papers and trained over 200 perfusionists. Pretty impressive credentials, I have to say. In looking at the time line that we are talking about, Hendricks College, and he went and decided to join the Navy. So in 1954 he went off to the U. S. Navy.

Now I come back and kind of flash back and give this: Charlie was a collector, and you will see that, and later I will talk about his collections. He collected things that people did not even know about. He had Russian tea boxes. He had sculptures made out of whale bone. He had whole collections of them.

We went to Paris. On his first trip he went to the luggage store and bought a gigantic steamer trunk to load all the stuff in that he was bringing back. He would have at least one or two. We would be at the Marche Biron, and I said, "Those things look like they were actually in the palaces."

He said, "They were."

And of course, all the palaces during the French Revolution got looted and all these pieces kept showing up. Charlie would be out there buying these pieces.

In the Navy, he shipped out to the Far East and was flying helicopters. On one of his trips to the Far East he was met by the family, mother and his sister, and one of Charlie's many girlfriends, and came back to the ship and his sister said, "I counted them all. There were 31 men helping him carry stuff off the ship." So they must have had a whole bay of the ship loaded with stuff that Charlie had bought in the Far

East. I mean, he had collections like you would not believe. His experience in the Navy was something he was always proud of. He said, "You'll always be a naval aviator," and that was something he really loved.

He left Little Rock, Arkansas and then went to Little Rock University and finished up his degree and proceeded on to go to medical school. That did not work out so well, so he did some postgraduate work in chemistry. He was a cardiac catheterization laboratory technician at the University of Arkansas, otherwise known as "Cardiac Charlie." Sherry Faulkner recalls times when Charlie would be running around everywhere, here and there, doing everything. So he went from head of the cardiac catheterization laboratory to head of the pulmonary function unit to head of open heart surgery for perfusion, and was at that time called pump technician. He was a pump tech at that time.

Charlie led a very interesting life outside of work. His apartment was known as whiskey a-go-go. You might guess there was a swimming pool there and you might be shocked to know that Charlie actually went swimming in the nude there on occasion. I know you are shocked. I seem to remember he did that at the AmSECT meeting in Portland in 1975, followed by many other people who shall go nameless.

Sherry always remembers him to say that you should learn more than you need. Always observe what you are doing because you never know how much more you are going to have to do. And you might be the only one there, and he said, "Always keep a physician beside you and you will not be in trouble." Now, you might be telling them what to do, as Sherry was describing how to recannulate a patient after the cannula started leaking. She had this resident who was an anesthesia resident, and he had no idea. Sherry said there was less blood in that anesthesia resident than there was in the patient because the color just drained out of his face. But she had him right by her side and recannulated. That was Charlie's advice. Charlie said, "Be more than you can be." He used to say that before the military took up Charlie's slogan.

He went on to Savannah, and he was on the Savannah heart team for two years. Charlie had made some very good friends with physicians there. He moved on to Norton's Infirmary in Kentucky for a year, then to Ohio State University, where he and Jim Dearing were on the same staff. Jim was director of the school and Charlie was one of the instructors. So that was quite a powerful group. Then they needed somebody down at Texas Heart, and Denton Cooley said, "I want Charlie." So we got Charlie down there. Charlie was down there in the early '70s, and

this is where his life really begins as far as forming things in perfusion. He was Director of Perfusion of the University of Texas, Chief Emeritus for Perfusion in 1985 when he retired. Then he went up to Pickles Gap, Arkansas, and built a home there and retired. But he really did not retire because he was always coming back to The Academy meetings, giving talks. He was still traveling. I will show you some of that as well.

What are some of the things that Charlie was? Well, he was certainly a perfusionist. He was an author. He was a researcher. And he always said that if you search the old literature, you will find many of the answers to those questions that we are currently looking for. Very interesting. That was just so incredibly true, because if you look at some of the work of Dr. John Gibbon, he did a lot of the things that we think are innovations in the way of monitoring, et cetera, et cetera. Now, he did not have the handle on anticoagulation that maybe we do now, and sometimes we do not have a handle on that today either.

Charlie was an educator and always a true professional. Charlie would cut up, and there is no doubt about it, he would act out. But he usually did it for effect. It was all directed. He was a great friend. He was a great brother to his sister, although he gave her a hard time. He was a father and he was reunited with his son before he died. He was a husband. Now, I told you Charlie was excessive. Not one, not two, not three, not four, but five wives. Now, many of us would have sagged under that, but Charlie just rose to the occasion.

[Laughter]

MR. HILL: You are getting ahead of me. Charlie was a poet, just an unbelievable poet. I have some examples of his poetry. It is kind of freeform, but let me tell you, there was a great eloquence about his poetry. And he was a Navy pilot, which he would tell you. This was, and I have to pardon, I am quoting. It is from Charlie Straight Arrow. That is what he called himself, his pseudonym. Charlie Straight Arrow. His publishing company was called Flying Titanic Press. This is a thought he expressed about a 16-month-old baby boy.

He was sort of helpless, too weak to raise his arms.

Even he could move his head back and forth.

And he would look at you pleadingly for a moment.

Then his deep blue eyes would wander aimlessly until you spoke.

Then those eyes pleaded again.

You didn't hear his feeble cry. You didn't feel his burning body. You didn't leave your TV and

*warm fireside.
You son of a bitch. Oh grand and glorious
physician, don't bother now.
The coroner will mail you the final diagnosis.*

Charles was always the patient advocate. And he was tough. He would hold your feet to the fire. He expected you to do the same to him. Charlie would stay by the patient's bedside, would sleep there when the patient first got to the unit. Remember these early days. We were not cranking out 20 cases a day. You might have a case this week and you might not have a case this week.

Charles Clay Reed was a rancher, farmer, and photographer. He did some beautiful photography. Charlie was really into photography. When Charlie did it, all of sudden he has cameras here or there. He was just really into photography.

He was an autocrat; there is no doubt about that. Any of you who have worked at Texas Heart Institute knew that and saw the autocratic style of Charlie. Now, sometimes he would be malevolent and sometimes he would not. He was a critic. He did not find fault needlessly. Usually when Charlie was finding fault there was a reason. He was truly a devil's advocate. He did not look like Al Pacino, but let me tell you, he did the job of a devil's advocate nevertheless. He was a true disciplinarian. As I say, he was a collector and a teacher and a great visionary.

Arthur Keats, God rest his soul, my choice would have been to have Arthur Keats give this lecture. I said to Terry, we ought to get Arthur Keats to give this lecture. He said that will be difficult. Arthur Keats passed away a few months ago.

Arthur Keats would describe him as a visionary. Arthur Keats was a visionary who was a powerful man in many societies and acted as a founding member in others. Denton Cooley was clearly another guy who really kind of pushed him on. He did not have to urge Charlie much because Charlie was always flying around with his hair on fire. Charlie had a mission. His mission might change from day to day, but Charlie always had a mission. Dr. Cooley described him and eulogized him in the Texas Heart Institute Bulletin and had such wonderful words to say about him. And to be able to train these people and keep them in control, that was sort of problematic.

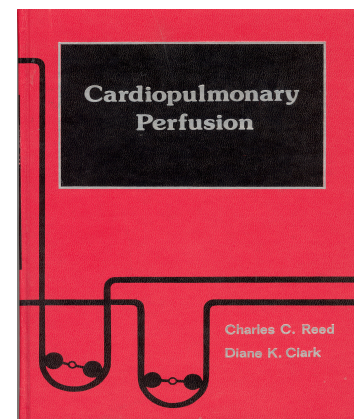
I talked to Trudi Stafford, who sends her regards, by the way. She said the students were out of control. She said they often were not in control. They were in control, however, when Charlie was around. Kelly Hedlund described it well. He said, there was never such a fear of the students as when they heard Charlie's in the pod. Because when

Charlie came down, there might be hell to pay. And you did not want to be in that situation. Chris Clay has fond memories of Charlie spitting in her face, he got so close to her, giving her a hard time about something she had done.



CC Reed with the 1st Texas Heart Institute School of Perfusion graduation class. (Diane Clark was to become the Associate Director of Academics.)

Here he is, and the first graduating class. Diane Clark. I talked to Diane, who also sends her regards. Diane and Charlie wrote the first red book, "Cardiopulmonary Perfusion" in 1975, and it is well known internationally. This is the most famous book in perfusion, next to Galletti and Brecher's "Heart-Lung Bypass." This is just unbelievable. So, a young Diane and a young Charlie at that point did a lot together.



Early days at the Texas Heart Institute. This is really the case. I mean, there were so many people in those operating rooms because Dr. Cooley was doing some groundbreaking stuff, such as hemodilution. Everybody else was blood priming before that. There were just amazing things going on at the Texas Heart Institute at that time. Those were exciting, exciting times.

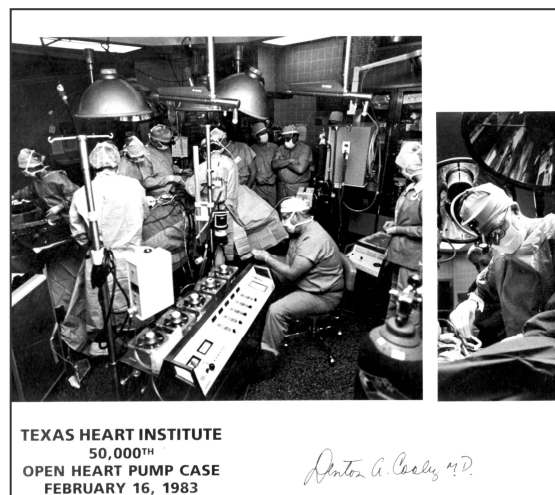


CC Reed mailed this Season's Greetings card to numerous perfusionists in 1977.

L>R: Sue Reaves, Craig Vocelka, Mike Sanford, Patricia Posnick, CC Reed, Diane Clark, Terry Crane, Chris Clay, Bill Reaves, Jane Hackett.

I think we see some familiar faces. Let us see. Starting over at the right I believe that is Jane Hackett. Oh, there is Chris Clay, Terry Crane right over there, past president, Diane Clark and Charlie, of course, Mike Sanford and Craig Vocelka. There is Sue Reaves and that is Bill Reaves all the way on the other end. This was when they sent the Christmas card. Were any of you ever fortunate enough to have one of those? I never kept it and I should have. They sent Christmas cards to everybody.

4,000 pump cases from January 3rd to December 16th, 1977. That was quite an accomplishment. Quite an accomplishment. That is a great shot, a great shot. Now, Charlie was in there for the 50,000th case. Of course, when they figured it out, somebody else was doing that. Now, if you look there, probably the staff person who was running the case is standing back there now and Charlie kind of went in for a photo-op.



CC Reed was involved in many major milestones for the Texas Heart Institute. (Currently THI has done over 111,000 pump cases.)

Charlie would adopt things. I like Charlie. He would adopt things. In fact, in researching this story, I told Charlie several stories which became Charlie stories. I read them. I said, oh, my gosh, I told Charlie that. We talked about disk oxygenators. There was a fellow from Florida, and we all happened to be out debriefing after a meeting like this at the local bar. We were all telling war stories. We always get to tell war stories. We felt then that we had to tell those war stories.

Well, in this case, this fellow started to get serious and we did not pick up on it because we were laughing. He is talking about running a disk oxygenator and the resident backs up and sits on the disk oxygenator and breaks it in half. The drive is still running, and blood is flying everywhere.

We said, "My God, what did you do?" And this guy is about ready to cry. And we are laughing. This guy, I mean, he really did not appreciate the situation.

He said, "I just pissed my pants. I just pissed my pants right there. I just let it go. What else could I do?"

And he was absolutely right. The patient was dead. The show was over. But I told that story and then I am reading one of The Academy *Proceedings* and that becomes the Charlie story. To me, that is the sincerest form of flattery because he thought it was a good story. And it was a good story.



Texas Heart Institute, St. Luke's Episcopal Hospital, and Texas Children's Hospital and their relationship to the Galleria area of Houston.

Texas Heart is a little bit different today. This is the Cooley building here in the foreground. Just an incredible edifice. You have, of course, St. Luke's at the back, observation dome, and it is really a Class A operation, let me tell you. Beautiful. If you kind of look at this medical center which grew from the time I was down there, and it was just kind of St. Luke's, and that was so many years ago. Gosh that was a long time ago. Anyway, all these facilities have grown up to support this particular medical center.



"Charlie was always waiting for the next case." Well, there was some truth to that. But Charlie always was around. In later years he got known for leaving at 2:00 o'clock. He would get there at 10:00 in the morning sometimes and leave at 2:00 in the afternoon. "Great hours," I said to Charlie. He said, "I made up for it. I am still in arrears for the times spent." Because when he first started, they were

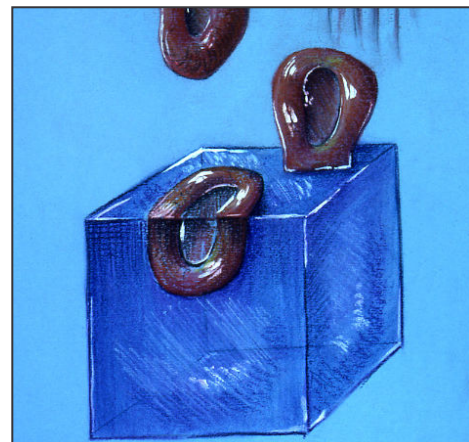
killing themselves for hours on end. Charlie worked very hard.

I was talking to Trudi Stafford one time. Trudi said, "I had it down." When Charlie would leave at 2:00 o'clock, she went along, and she went out, and Charlie had gone at 2:00 o'clock, kind of the usual. Well, she did not realize it but Charlie had stopped at a store or something, she gets in her car, pulls up to the light and looks over, there is Charlie, waving, saying, "Ah, escaped early." Trudi felt that Charlie was always a visionary. He could just see things the rest of us could not see. He could conceptualize them. He was an amazing, amazing individual.

When they were writing the book and this is another interesting story. Mark Kurusz, forever the editor. I have to thank so many people who helped me, Mark Kurusz being one. Mark was saying, you know, "You realize this 'Cardiopulmonary Bypass' is the second one and the other one is 'Cardiopulmonary Perfusion,' and they called it 'Cardiopulmonary Bypass, Volume No. 2.'"

There really wasn't a No. 1. But that never stopped Charlie. Charlie would do something different. He says, "That is okay. It's all right. It's all right." And it was. It was. Charlie was inventive to the end. He did just amazing things.

But he did actually do cases. And here he is caught doing an actual case. Mat Tyndal, I was talking to him about this. He said he was sitting there and all of a sudden this incredible weight rested on his shoulder. That was Charlie. Charlie was just giving him a hard time. He wanted to make sure that he could handle some stress, and the ultimate stress is, you had that director standing right over your shoulder. You know, that is terrible. That is terrible.



The "Square Bubble" provide greater surface area for oxygenation.

$$\begin{aligned}
 \bar{v} &= \int_0^{\infty} v \phi(v) dv \\
 &= \frac{1}{N} \int_0^{\infty} v N(v) dv \\
 &= \frac{1}{N} \int_0^{\infty} v 4\pi N \left(\frac{m}{2\pi kT} \right)^{3/2} v^3 e^{-mv^2/2kT} dv \\
 &= 4\pi \left(\frac{m}{2\pi kT} \right)^{3/2} \int_0^{\infty} v^4 e^{-mv^2/2kT} dv \\
 &= \frac{2}{\sqrt{\pi}} \left(\frac{2kT}{m} \right)^{1/2} \int_0^{\infty} x e^{-x^2} dx \left\{ \begin{array}{l} x = \frac{mv}{\sqrt{2kT}} \\ dx = \frac{m}{\sqrt{2kT}} v dv \end{array} \right. \\
 &= \left(\frac{8kT}{\pi m} \right)^{1/2} \Gamma(2) \\
 &= \left(\frac{8kT}{\pi m} \right)^{1/2} \\
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 \bar{v^2} &= \int_0^{\infty} v^2 \phi(v) dv \\
 &= \frac{1}{N} \int_0^{\infty} v^2 4\pi N \left(\frac{m}{2\pi kT} \right)^{3/2} v^3 e^{-mv^2/2kT} dv \\
 &= 4\pi \left(\frac{m}{2\pi kT} \right)^{3/2} \int_0^{\infty} v^5 e^{-mv^2/2kT} dv \\
 &= \frac{2}{\sqrt{\pi}} \left(\frac{2kT}{m} \right)^{1/2} \int_0^{\infty} x^3 e^{-x^2} dx \\
 &= \frac{2}{\sqrt{\pi}} \left(\frac{2kT}{m} \right)^{1/2} \Gamma\left(\frac{5}{2}\right) = \frac{2}{\sqrt{\pi}} \left(\frac{2kT}{m} \right)^{1/2} \left(\frac{3}{2} \right) \Gamma\left(\frac{3}{2}\right) \\
 &= \frac{2}{\sqrt{\pi}} \left(\frac{2kT}{m} \right)^{1/2} \left(\frac{3}{2} \right) \left(\frac{1}{2} \right) \sqrt{\pi} = \frac{3kT}{m}
 \end{aligned}$$

CC Reed's "formula" for the "Square Bubble Theory".

Now, for those of you who have forgotten your differential equations, this is a Laplace transformed. Charlie went to an AmSECT meeting and showed these formulas, described the technology, and here is the slide. He described the square bubble theory in total seriousness. I mean, it was a total put-on. Absolute put-on. But he described the square bubble theory. He actually presented this at a national meeting. I thought this was just the most outrageous thing. For the people who actually were in on it, it was great. But people were hook, line, and sinker—they were taking notes on the square bubble theory. But Charlie would poke fun at himself. He did not mind.

Charlie always presided over the students at their usual graduation, which the staff members and spouses were not invited to, much to the chagrin of the wives and husbands and friends and wives of others and whatever. But Charlie always saw that they had a good time. They usually tried to do it during the week because if they did it on the weekend they know they might lose two or three people over an entire weekend.



CC Reed at a THI School of Perfusion Graduation.

The students at Texas Heart were if nothing else hard working. I personally recommended Bob Groom go down there. I said, "Bob, you've got a great technical education. Go down to Texas Heart." When Bob was down there, he was able to do so many cases. Let me tell you, the more cases he wanted to do, they gave them to him. He was so busy. But for him it was such a great, valuable teaching experience. He actually taught them how to use an autotransfusion setup; because that was not something they were into. He actually talked to them about balloon pumping because that was something he had done before he left and that was something they did not do there at that time.

I would tell you, it has always been a great experience and to look at the number of people who have graduated from there. The students were always a little bit mischievous. This was a special oxygenator that was created by the students. You can see here it has the appropriate connectors, but I think that is about it. I think this, of course, was the usual pumping in the pan exercise.



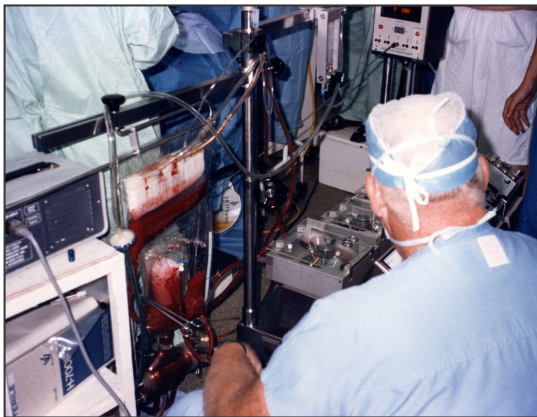
CC Reed at the Texas Medical Products booth during a perfusion conference.

Charlie was involved with Texas Medical Products. Texas Medical Products made tubing packs and probably made Charlie a dollar or two. Denton Cooley was involved in it. It was sold and bought and sold. It was sold to Norton. Charlie wound up with some Norton stock. It was not such a bad thing. But Charlie had put a lot of time and effort into Texas Medical Products. Then later on it continued on to be Surgimedics.

Obviously, the big red book. Let me tell you that is one thing you do not want to miss, the big red book. I think everybody had a copy of it. I would recommend you read some of the past *Proceedings* of The Academy, especially when we did Charlie's memorial service. There are so many interesting stories. We did a memorial service for Charlie. At that memorial service people talked about the red book. There were letters and telegrams that came from everywhere, all over the world.

Charlie had considered himself the godfather of the CECEC meeting. And he was. Gerard Sauben visited him. Gerard was the Director of the French International Society and had the CECEC meeting going, and Charlie told him how to do it. That was just incredibly interesting, I thought. Charlie always loved Paris.

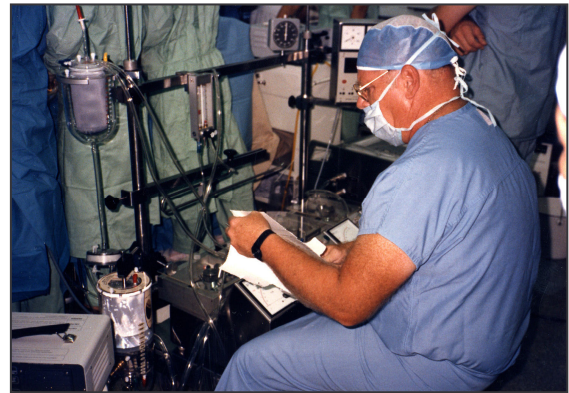
He also did "Safety and Techniques in Perfusion." I did not have a picture of the Reed and Stafford book which fell in between these, and this was a lot of cases and stories about problems. That was a good thing. It was a good thing to have. The green book talks about cases and problems that occurred in cases.



CC Reed with a leaking bubble oxygenator in China, but he was use to similar situations in the United States.

Charlie went to China. This was a memorable experience. Again, I relied on Terry Crane for some of these things. Terry said they had to literally buy their way out of the country to try and get out of there. Of course, the team brought over surgical instruments which must have been misplaced. They

would not have stolen them. But they were missing half or three-quarters of those instruments. They were just happy to get out of the country. But they went there and were able to do cases there. There was a physician surgeon who became director of perfusion. He marveled at how the team functioned and how well they worked together. This was in the time of Chairman Mao, by the way. There was a Chinese built oxygenator, which had a towel underneath it because it was leaking at that point. Charlie admitted how this had made him a bit nervous, and very little made him nervous. He decided he would get one of the most current bubble oxygenators out. Charlie used that bubble oxygenator and showed the Chinese, now; this is the way you do things here. I am sure that oxygenator was used on at least a hundred patients after that.



CC Reed was a little more comfortable in China while using American made oxygenators.

Charlie was into art. He would paint. He had great perspective and a good eye. He actually had a studio at his home in Pickles Gap. It was just very interesting. He was just such a multifaceted guy. He did so much for perfusion. He was a great visionary.

You will notice that Charlie was a little bit trimmer at times. This was probably during one of the periods where Charlie was in love. And that was many times. Charlie was passionate. You can ask any of his friends. Charlie was a passionate individual.

Terry would say that they went down to Central America on one trip, they wound up in the middle of the jungle somewhere. Now this is the guide here who speaks very little English. He was going to show Charlie where all the orchids were. Charlie went down there to gather orchids. Those of you who have visited Charlie at home, he had this incredible collection of orchids. He did not have a backyard. He had a greenhouse. The whole backyard was a greenhouse. Well, Charlie fell in

love and then the orchids died, because you have to take care of them. But he would always go down and get more. In fact, just before he got sick, he was actually contemplating going down and doing another trip to collect more orchids. He loved orchids and fine things. People would talk about, what is that aroma in the office? Not what you think. It was in fact orchids. It was orchids that he would have in his office.



CC Reed collecting orchids or was this when we got lost and had to "chop" our way out of the jungle?

Terry said he thought they were done for. Terry said, "They are going to write my epitaph. I am down here in the middle of Central America and we are lost and we are not going to get out of here."



CC Reed and his guide leaving the jungles of Panama after collecting orchids.

Charlie in his inimitable way, they circled around, circled around, and finally, of course, they made it out of there. But that was Charlie Reed. It did not take much for Charlie. Charlie had a great sense of direction as well.

Now, this is Tally Hill, whom I mentioned earlier. This is when we went to Paris. We always have to go on the Baton Mouche. The Baton Mouche is the boat, and you had to go on the boat.

We would have dinner on the boat. That was always a big thing for Charlie. Tally was one of the spirited members of the American Board, Canadian colleague of Jim MacDonald from Toronto General at the time. Tally was not related, but she was just an amazing person, amazing person.



CC Reed with Tally Hill on one of his many travels.

Here is Charlie's last book, and there is so much of his poetry, I could not quote it all. Charlie Straight Arrow, "Out of the Shadows" was the title of the book.

*Tonight.
I deeply regret that I will never see Arcturus up
close.
Or Orbit Rigatrrre.
Or Delta Epsilon 7.
I think I might have been a hell of a star ship
commander.
Yes, my love, I fantasize even as you do.
Will you walk the shore with me beneath the
sparkling stars this night and talk of here
and now, of love?
And perhaps of orbiting Delta Epsilon 7.*

Amazing poetry. Absolutely amazing.

This is another group. I mentioned Dick deJong. Dick deJong sent telegrams over at the time of the Charlie's passing. This is Ben Mitchell. There are a lot of people. I was trying to imitate Mark Kurusz. I did not have the glasses, but I had a mustache at the time and longer hair. I think I had a pageboy at that point. Professor Taylor, of course, was there. Ben Mitchell and Charlie had a very interesting relationship, as did Charlie with Dr. Kolobow. He declared Dr. Kolobow's oxygenator as almost unworkable. However, I think that has gone to outlive Charlie. It has been 40 years of use for the Kolobow oxygenator.

Then we had to go down and visit Charlie down in Pickles Gap. You recognize Earl Lawrence. Earl was a close friend of Charlie's and would do anything for Charlie. We arrived there and all of a sudden we had all of this African hardware. He was standing in a headress and everything, waiting to greet everyone. I asked Earl Lawrence, I said, "Now how do I know when I get there?"

He said, "Just keep driving until you see something that looks like a Ramada Inn. That's it." And it was pretty big.

He had all sorts of paraphernalia. He had animals. He had a Clydesdale. He had all of these other animals on this farm. Charlie was a very eclectic man. That was his mailbox, which is right behind Mark there. That was one of the original heart-lung machines that Charlie had actually used. We all kind of conspired and got that together for Charlie at the time.

Charlie would paraphrase, because I think I have heard this phrase before. But maybe it was Charlie's. I do not know. From Charlie Straight Arrow.

Where in Hell is Mulberry Street.

Numbers.

*If you don't make a conscious effort to change it,
the only difference between this year and the
next year will be the last digit.*

Charlie was passionate about perfusion, he was passionate about so many things, but he was one who would continually do things that would even put his own job at jeopardy. I remember when Charlie put together a white paper and told the manufacturers, how much is the acceptable water leakage from the heat exchanger to the blood circuit? And they wanted to hear something like so many micromoles. Charlie said, "Absolutely none." And we put it in a white paper and published it.

Well, you know, what we found out right away was how many people really were connected to manufacturing. And all of a sudden the heat started. You have to remember, I worked for a surgeon who was trained under Dr. Albert Starr. The telephone calls started immediately. Denton Cooley was getting telephone call after telephone call from all his surgeons. They told him, "You have to get rid of Charlie."

Denton Cooley says, "You may regret this, Charlie."

I thought it was done. I thought we were all -- you know, the real deal was that we got things

ratcheted up a level from a safety standpoint. I mean, we used to have oxygenators blow up routinely. It was not unusual. Things looked like an axe murder took place in the room. Because these old membrane oxygenators were under incredible pressure and would blow up. After that, I think the manufacturers were under incredible pressure to move on and change things. So Charlie would put his neck on the line to make it happen.

CC Reed with Raymond McInnis before his retirement in 1985. (Charlie passed away in February, 1990.)



Charlie had this great, and I can hear his voice now, this great laugh. And Charlie's voice was low and he would sing a great rendition of "Old Man River." I had only heard parts of it. Chris Clay said that she had heard him sing that many times going to the classroom.

Charlie was if nothing else eclectic. He sent a letter to John Meserko when the Cleveland Clinic was advertising that they were doing twice the number of open heart cases of any institution in the United States. And, of course, Charlie fired off a letter immediately to John Meserko to tell him, now look, let us talk about this and let us compare numbers.

Charlie was always willing to poke fun at other people and himself. Charlie was an incredible, incredible man, a true icon for the profession. And those of you who did not know him, I am sorry. I hope I have given a little bit of light to see how wonderful Charlie was.

Thank you very much.

[Applause]