

mountain climbing and reached the top of all 67 peaks of over 14,000 feet (4300 m) in the continental United States. Charles celebrated the favorable outcome of mantle radiation therapy for Hodgkin disease in 1970 by a guideless climb of the Matterhorn.

Charles never gave up; he overcame his catastrophic physical handicap after his sec-

ond aortocoronary bypass surgery and continued to work. From his bed he directed his research and offered guidance, encouragement, and bright perspectives for the future. After 18 shared and exciting years, it is difficult to accept Charles' absence; he is sorely missed. Memories of him and his contributions will be cherished by all vascular radiol-

ogists, those who were privileged to work with him, and his numerous friends.

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With the death of Dr. Charles Dotter, the world has lost an extraordinarily innovative contributor to our capacity to diagnose and treat cardiovascular disease. He was at the same time contentious, humorous, imaginative, sometimes grandiose, and always thinking about new ways to help the sick.

Everyone in radiology and cardiovascular disease knows of his contributions, and I will not review them here. Instead, I would prefer to deal with what made him unique as a man and as a scientist and recount an anecdote or two that shed light on his personality.

I met him first when he was working with Israel (Gus) Steinberg at Cornell, and I was struck then by the odd couple—the radiologist and the cardiologist, each full of enthusiasm and zest for a method, each pursuing it to its limits, but totally different in personality and perspective. One day in the 1950s, Charlie and his wife dropped by our home in Marin County (where we lived until Stanford Medical School moved to Palo Alto in 1959). They had been rummaging in one of their favorite haunts, an Army surplus store, and had brought a small gift for our two children, aged 7 and 10. We lived on a hillside, among the redwood trees, with a large patio extending the length of the house. There, before the wide eyes of my kids, Charlie took the exhaust from a vacuum cleaner and proceeded to blow up a war surplus balloon until it was larger than the patio itself. As it reached the edge of the patio, a lovely rose bush with a nasty thorn punctured the balloon, and it rapidly collapsed to the ground. Charlie picked up my son, lifted him into the air and said: "Well, you win some and you lose some. That's life, sonny boy."

And that was Charlie's way. If someone ridiculed his latest thought or shrugged his shoulders in expressive skepticism, Charlie was never daunted. Not only did you "win some and lose some," but also "time would tell."

In 1963 when Cook Incorporated was founded, we were fortunate enough to get space at the RSNA meeting at the Palmer House in Chicago. On Monday afternoon, I was demonstrating to prospective customers how to pull tips on Teflon catheters when I noticed someone behind me sitting on a box. It was a short, muscular, bald man with darting eyes—I didn't know who he was, but he made me nervous. When there was a lull in business, I turned and asked if I could be of

So it did. The mere fact that "Dotter-ize" had become part of the English language—whether or not it could be found in Webster's *Unabridged*—gave him not only a sense of pleasure at the recognition, but a special delight at the vexation of skeptics, for he always believed that his ideas—no matter how "crazy" they seemed to others—had currency. Floated before their time, they ultimately had staying power to validate the original concept, and no one was more excited than Charlie when this proved to be the case.

He had a passion for crystallizing and clarifying. He possessed a superb dramatic imagination and the melodramatic intuition of the best of the soap-opera writers. He used these creative talents, particularly in the teaching process, but also to convey scientific information. He was a master of *emphasis*—of the colorful illustration, of the indignant grimace, indeed, of linguistic exaggeration whenever required to prove his point.

A few years ago, he presented a paper in which he compared the reactions to a hyperosmotic contrast agent with those to a nonionic agent in a series of patients. He had solid scientific data, but he also wished to make his point unequivocally. His paper consisted of a few sentences. At the beginning: "Let me turn this machine on." At the end, "That's all, folks." In between, he played a tape recording of patients experiencing arteriography with the hyperosmotic agent. As the contrast material spread down the abdominal aorta into the iliofemoral system in these patients with aortiliac disease, the groans, shrieks, and expressions of pain and dismay of all kinds reflected better than any and set of quantitative data the full impact of the procedure on the patient. The tape then continued with the recordings of another group of patients who had received the non-ionic agent. For the most part, one mainly heard the physician, Charlie, inquiring solic-

itously: "How does it feel? Does it hurt? Do you have a sense of burning?" And from the patients, not a shriek, groan, or even a single, "Doctor, how long will it last?" The tape lasted a few minutes. Charlie turned the machine off, faced the audience, asked: "Any questions?" And, when there were none, he sat down to a round of applause.

Was it science? Yes, in that the comparison was made under similar conditions, on matched patients, in randomized fashion, and the data were available. But no one had ever brought out the findings and the conclusion more surely, more conclusively, more emphatically than in those few moments of recorded agony.

Charlie never attended a meeting that was not enlivened by his presence. All who talked with him walked away with at least some of their own firmly held convictions shaken. In some respects, he was a Marxist—a Groucho Marxist who could roll his eyes in mock dismay as he listened to the nonsense that some of us spouted, and could leer as well as Groucho as he expressed his incredulity at our naiveté.

An original has passed from the scene, one of the grand actors on the stage of modern angiography and interventional radiology. We will miss his fertile mind, his caustic comments, his strong convictions, and his understanding and belief that there were other ways to help sick patients and that he had some of the answers.

Although you're gone, Charlie, you'll be around for a long, long time, in the hearts and minds of your family, friends, and acquaintances and in the appreciation of countless patients who benefited from your explorations into uncharted realms. Goodbye, Charlie.

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help, and he said "no"—nothing more—and left. Just before we closed for the day, he returned and asked if he could use my blowtorch and "borrow" some Teflon tubing. He said he wanted to practice making catheters in his hotel room. Thinking I had a real "space cadet" on my hands, I said, "Sure, may I have your name?" He answered, "Charles Dotter."

The next morning, he was waiting for me with 10 beautifully made Teflon catheters and my blowtorch. Remember, I had just started

my business, and I admit that those 10 catheters were sold to someone else for \$10.00 each later that day. He was my first production employee.

Every day during that week he returned; we discussed wire guide and catheter manufacture and what he thought the future would be for angiography. He became excited when he talked of his work, and yes, we discussed angioplasty. He hauled out the picture of his famous plumber's wrenches

that we've all looked at so many times. Once started, his mind went nonstop.

On closing day, he appeared again at the booth and asked if I could come to Portland. I told him that I would; before he left he said, "You probably can't afford it so I will pay your expenses."

For those of you who saw his laboratory in 1963, you'll remember that it was the state of the art, the finest in the United States. When I arrived, I saw how his technicians made wire guides—yes, they made their own. Also, they were producing their own Teflon catheters using a recently purchased blowtorch and our Teflon tubing. Charles, by the way, was making the catheters.

During this visit, he gave me a sketch of two telescopic catheters—10 and 14 French. I took the sketch home, ordered the tubing, and began producing the Dotter dilatation set. His first use of the set to open a blocked artery succeeded in saving the leg of an 83-

year-old woman facing amputation in 1964. Some time later, I received a film of that woman's leg—angioplasty was on its way.

Dotter's hundreds of publications demonstrate that he was a creative genius, but they tell so little about the man. He possessed a fear of failure, and because of this fear he drove himself and his associates to explore the new. He liked the word KISS in everything he designed: Keep it simple, stupid. Charles was reputed to be brutal to residents and colleagues, but I knew him only as a gentle, kind friend.

During the 1960s and 1970s, he would occasionally call and say, "Let's go out West." One time in Montana, Charles and several friends of mine from Indiana were having coffee at a restaurant in Beaverhead National Forest. All of a sudden, Charles ran out the door with his camera. Some time later, we found him at the foot of a tree talking to a young bear and snapping pictures. We

learned later that the treed bear was one of the rogues that had killed several young people in Yellowstone Park and had recently been relocated in Beaverhead.

Charles also took me mountain climbing—once. There we were on Three Fingered Jack in a blizzard—never again! He also tried to talk me into flying under a bridge so he could take pictures for one of his films—I wouldn't do it. Next, he asked if I would fly him near several mountain peaks in Southern Oregon—I did, but he couldn't take pictures because of the turbulence and snow. He was a birdwatcher, artist, music lover, photographer, car buff, mountain climber, and a constant challenge to his body and his mind.

Thousands of people are alive because of Charles Dotter. He was a friend and he can never be replaced. So long, Charles.

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