Oh the Places HEHAS GONE

WORDS BY MARYANN BRINLEY / PHOTOGRAPH BY ANDREW HANENBERG

o borrow a classic Dr. Seuss line, *Oh*, *The Places You Will Go*, is absolutely appropriate in describing Frederick F. Buechel, Sr., MD, UMDNJ-New Jersey Medical School (NJMS) class of 1972. The number of places that this physician, world traveler, and co-inventor of the first artificial knee in the United States to move in every direction has gone — geographically and intellectually — is mind-boggling.

In his travelogue, you'll find China, Japan, Sweden, Australia, Italy, Germany, France, Spain, England, Austria, Czechoslovakia, India this past March, Korea later this year and Florida once a month, where he doesn't sit back and relax on a beach but instead scrubs in on robotic, joint replacement surgeries with his son Frederick Buechel, Jr., MD, NJMS '95, a successful orthopedic surgeon with a busy practice there in the Naples area. (Yes, he uses dad's implants for his total knee replacement patients.) If you click the print button on the elder Buechel's electronic CV, 73 pages later, this

professional tour will have taken you into a lifetime of accomplishments starting back near that New Jersey LCS Total Knee Replacement System which he started designing with his former teacher, Michael Pappas, PhD, when he was just a resident in orthopaedics.

It all started when Anthony DePalma, MD, one of the world's leading authorities on the knee and the shoulder, was lured out of retirement by Benjamin Rush, MD, chair of the NJMS Department of Surgery, to set up the Orthopaedics Department at NJMS in 1971. Buechel recalls, "I was Dr. DePalma's last research resident before he retired a second time and he stimulated me to learn more and more about joints. I became the resident who developed artificial joints." Meanwhile, Pappas was an NJIT engineering professor also brought in by DePalma to teach the orthopaedic students all about biomechanics, "a brand new field back in those days of 1973, 74." Mechanical engineering and orthopedic surgery had a lot in common but "we didn't speak the same language," Buechel remembers. "I had to learn Pappas' and he had to learn mine." They clicked.

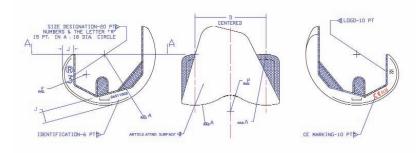
The knee, in fact, was just the beginning for these guys. Together, they can point to a long list of orthopedic firsts including floating socket shoulders, hemi-shoulders, total shoulders, total hips, mobile bearing knees, total ankles and finger joints. In the beginning, "we were both motorheads," Buechel explains. "We liked motorcycles and both lived in Irvington. I would ride over to his house and he'd ride over to mine. We went back and forth and started designing joints on napkins."

Napkins?



"Yes, literally on napkins."

That was more than 150 U.S. and international patents ago. Curiosity and collaboration, in fact, are the secrets to Buechel's success. "You need an ability to focus and continue on but you can't do it by yourself." Working with Pappas for more than 35 years, Buechel comes up with the anatomical concepts and theories while Pappas puts them on paper. "Pappas has a lot of talents. He's always on the computer designing something and we bounce ideas back and forth until they meet our criteria. We really enjoy our collaborations." Buechel-Pappas joint replacements have helped millions of patients walk and move pain-free. On lecture trips around the world, in what Buechel calls "a one-two punch for the audience," Pappas presents the engineering side while Buechel covers the surgical-clinical side. The recipient of many awards over the years, the two were named "Inventors of the Year" by the New Jersey Inventors Hall of Fame and won a Pride Award from New Jersey Monthly magazine in 1998.



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"Dr. Pappas, my son and I are now working on a new unicompartmental, meniscal bearing for the knee, which is installed by a robot and much better for longevity," Buechel explains. "My son is an excellent, compassionate surgeon whose patients love him. So this is fantastic for me. I was technologically oriented when I was his age but I'm lost in the computer age." Their new mobile bearing knee replacement will be the "best of all possible worlds" for patients who meet certain criteria, he says. "They will get a long-wearing device, put in with robot precision, which won't wear out as quickly. and they'll go home, walking out of the hospital in 23 hours, without a cane." After total knee replacement, regaining strength can take months of rigorous physical therapy, Buechel points out. "With the type of surgery my son is doing, you come in healthy and you leave the same way, not having lost any grades of strength." Pappas and Buechel actually worked on a uni-compartmental device more than 30 years ago, but back then, they didn't have a technique for putting it in through a small incision.

The largest alumni donor in the history of NJMS, Buechel started giving back to his alma mater in 1989. Ever grateful, in 2002, he established the Frederick F. Buechel,

MD, Chair for Joint Replacement through the Foundation of UMDNJ to "push the frontiers of human joint replacement research into practical, clinical applications" with a gift of \$2 million. "I couldn't have done any of this in my life if I hadn't gone to New Jersey Medical School." And that looked iffy at first. After graduating from Seton Hall University in 1967, this NCAA All-American wrestling champion applied to several med schools and ended up on three waiting lists. Disappointed, he was making plans to go to Germany when a job came along as a lab tech working with biochemists from NJMS at the Veterans' Affairs Medical Center in East Orange. Research was being conducted for Carroll M. Leevy, MD, an NJMS Distinguished Professor and founder of the Sammy Davis, Jr. National Liver Institute. "I worked in one of the Quonset huts behind the hospital in East Orange and was trained to be an animal surgeon. I became very proficient," laughs Buechel. "I became the main rat surgeon." Then, the nephrology department needed his expertise as well. "I was only 22 but having a great time doing all the research."

Ultimately, it was Leevy who made the call, "to my great delight," telling him that he'd been accepted into the medical school for September, 1968.

"Going through school, I had so many wonderful teachers. It was great," he says. There was one black student in his class, Robert Johnson, who happens to be interim dean of the medical school today. "Bob Johnson still has the same great smile." There were only four women. "Those ratios have really changed," he says.

In 1986, on a trip to Taipei, Taiwan, at the invitation of Chinese leader Chiang Kai-shek's personal physician, Buechel ran into trouble. Dressed in workout clothes for the round-theworld flight which had taken him through

Amsterdam to the Far East, he arrived at his destination and was denied entry into the country. "Security said I could be a terrorist," he says. Though he protested and showed them his letter of invitation, he was held back and left stranded inside the airport for hours. There were no cell phones at the time and he had no local cash to place a call on the airport telephone nearby. He was frustrated and worried.

Suddenly, "a little old lady sweeps past me," he recalls, "then again and a couple more times with her broom." In broken English, she stopped and asked if she could help him. When he explained that he was being detained and needed to contact the doctor who had invited him to Taiwan, she took money from her pocket for the payphone and called the doctor's office herself. A welcome committee had actually been waiting for him on the other side of the airport, wondering what had happened. When told of his predicament, the doctor's office made the right connections and the guards took a different approach with him. He was greeted with "Welcome to our country Dr. Buechel. I had thanked the little sweeping lady but I never saw her again. Now I think of her as one of the many wonderful people who have helped me along the way. It's been a fantastic voyage for me."

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