FROM ITS HUMBLE BEGINNINGS, UTAH HAS BEEN A SYMBOL OF INDUSTRY, VISION, AND PERSEVERANCE. MEN, WOMEN, AND CHILDREN WITH PIONEERING SPIRITS CAME SEEKING REFUGE AND A PLACE TO PURSUE THEIR FAITH, HOPES, AND DREAMS. BUT EVEN MORE AMAZING THAN THE TENACITY OF THOSE HARDY INDIVIDUALS IS THE PIONEERING SPIRIT THAT STILL REMAINS IN THE SHADOW OF THE WASATCH MOUNTAINS. UTAH IS A VIRTUAL MECCA OF INNOVATION, CONTRIBUTING TO ADVANCES IN MEDICINE, SCIENCE, AND TECHNOLOGY. AND ALTHOUGH A FEW STAND OUT, IT TAKES MANY LITTLE STONES TO BUILD A ROAD.

—By Kris Brunson and Natalie Taylor

Harvey Fletcher, Ph.D.
Hearing Aid Inventor
(1881–1981)

Imagine not being able to hear the sound of birds in the springtime or your loved one’s voice. Dr. Harvey Fletcher’s scientific and engineering talent brought sound to many who had lived without the sense. Considered the forefather of stereophonic sound, Fletcher developed the Western Electric Hearing Aid in the 1920s, the first such device to use vacuum tubes. After serving as Chairman of the Physics Department at BYU, Dr. Fletcher researched sound at the Western Electric Company in New York where he was appointed Director of Research at Bell Telephone Laboratories from 1927 through 1949. During this period his genius blossomed, as did his accomplishments. Fletcher led much of the era’s research on binaural or stereophonic sound recording at Bell Labs, aiding the development of the telephone. He was the first president and co-founder of the American Acoustical Society, and in addition to a lengthy and prestigious list of groups and boards, he was the first Utahn to become a member of the National Academy of Sciences. Fletcher helped those with perfect hearing and those without enjoy the world of sound.
Romania Bunnell
PRATT PENROSE, M.D.
Ophthalmologist (1839-1932)

Romania Bunnell Pratt may have been the first physician to remove a cataract in Utah. Soaring mortality rates prompted territorial governor and LDS Church President Brigham Young to encourage women to receive medical training. Romania responded and, leaving her children in the care of her mother, went east to study medicine. In 1877, after battling numerous financial problems, Romania graduated from the Women’s Medical College in Philadelphia. When Dr. Pratt returned to Utah, she opened a medical training school for women. The six-month program cost $50 including tuition and board. A few years later Dr. Pratt received additional training in diseases of the ears and eyes. She became resident physician for the Deseret Hospital in 1882, which served as a women’s medical school (specializing in nursing and obstetrics), an emergency hospital, and maternity home. Dr. Pratt was passionate about more than just medicine. She zealously supported women’s suffrage. Dr. Pratt lived to be 93 and forever left her mark on Utah medicine.

Robert K.
JARVIK, M.D.
Physician/Designer

It was December 1982, when the Jarvik-7 made its world debut at the University of Utah Medical Center. Dr. Robert K. Jarvik, the young designer of the device, came to Utah in 1971 after two years in an Italian medical school and a year studying biomechanics at New York University. He came to participate in artificial-organ research, specifically heart research under Dr. Willem Kolff. Jarvik entered medical school in Utah, but continued to participate in artificial-heart research. He was asked to improve upon current artificial-heart designs. What eventually developed was the Jarvik-7, a two-pump system which imitated the natural motion of the ventricles. It kept Barney Clark alive for 112 days, and William Schroeder, the last Jarvik-7 recipient, lived 18 months. But they were both plagued with problems. Controversy began to brew, the FDA withdrew its approval, and Jarvik left the University but not artificial heart research. Eventually, Jarvik reappeared with his newest design, the Jarvik-2000, about the size of a "C" battery, and the FDA recently approved the device. Jarvik's efforts brought new possibilities to artificial heart research. Others built upon his design and in 1995 a new artificial heart debuted in Utah in transplant recipient Al Marsden.

Maxwell Myer
WINTRROBE, M.D., Ph.D.
Hematologist (1901-1986)

One of the greatest contributors to our current knowledge of the blood and disorders of the blood is internationally renowned hematologist Dr. Maxwell M. Winthrope. He came to Utah in 1943 from John Hopkins University to help establish a school of medicine. He helped the medical school receive its first $100,000 research grant and pushed its students to give their best. Dr. Winthrope authored Clinical Hematology, considered the bible of hematology for over 40 years. His research shed new light on anemia, including sickle-cell anemia, Hodgkin's disease, leukemia, and rheumatoid diseases. Dr. Winthrope developed hemocrit, a devise used to determine the whole blood's percentage of red blood cells. It also accurately measures anemia, regardless of its cause. Dr. Winthrope died in December 1986, but his contributions and discoveries have influenced nearly every corner of medicine.
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Willem J. KOLFF, M.D., Ph.D.
Father of Artificial Organs

Dr. Willem J. Kolff is gifted with a pioneering spirit, but often endured scorn and ridicule for his unorthodox methods. Using sausage casings and washing machine parts, Dr. Kolff created a prototype for what is now lifesaving kidney dialysis. Maybe ridicule is the sister to success, for Dr. Kolff has received hundreds of honors and awards for his pioneering contributions. In 1967, after an already illustrious career, Dr. Kolff came to the University of Utah. He directed the surgeons who removed Barney Clark's failing heart and replaced it with the Jarvik-7. And as director of the Institute for Biomedical Engineering, he oversaw the work on other artificial devices: the arm, the eye, and hearing. Sounds rather futuristic considering young Willem once dreamed of being a zookeeper. Maybe the urgings of his father or his desire to help others find "an enjoyable existence" prompted him to change his mind.

For over 60 years, Dr. Willem Kolff has focused his drive and energy on the design and creation of artificial organs. At 91, he still works on an artificial lung in the arts-and-crafts shop of his Philadelphia retirement home.
 Utah's Dr. Leon W. Hansen was the first board certified obstetrician to make ultrasound available outside the doctor's office. In 1994, he founded Fetal Foto after being bombarded by patient requests for additional ultrasounds not covered by most insurance. A physician charges about $280 for an ultrasound, but Fetal Foto was designed to eliminate physician constraints while making the technology affordable and more available. The FDA, however, disagreed with the "unapproved use of a medical device" and began to shut down similar studios. Dr. Hansen agreed to operate under FDA guidelines, providing "limited medical information," such as gender and heartbeat. A study in *Ultrasound in Obstetrics and Gynecology* claimed that ultrasound had positive short-term effects, on both father involvement and the mother's interest in prenatal care. "It's a positive emotional experience," says Dr. Hansen. Fetal Foto may soon expand to 4D according to new owner Alicia Aiken. The prospect of affordable ultrasound has excited the public, many critics, and numerous discussions from *The Today Show, The Wall Street Journal*, and most recently *Time* magazine.

In an era when thousands of people are affected by cancer, Dr. Mark Skolnik's groundbreaking genetics research may be the closest thing we have to a cure. Considered a forefather of the genomic revolution, Skolnik co-founded Utah's Myriad Genetics, Inc. in 1991, the first genetic mapping and testing company in the nation, and currently works there as chief scientific officer. In 1994, under his direction, the company discovered and cloned the gene that shows susceptibility to breast cancer—BRCA1. Women can now be tested for the BRCA gene. Learning of susceptibility helps them to either avoid contracting breast cancer or getting early treatment when cancer is more responsive. "The test has literally saved hundreds of lives," says Skolnik. Using genealogical records, Skolnik reconstructed genealogies by tracing diseases through a family lineage, thus recognizing patterns in the genes that may increase the possibility of disease. With this information in a computerized system, he contacts people, tests them, and is able to detect and treat breast cancer and other diseases sooner.

What makes Dr. Chris Johnson an award-winning problem solver? Quite possibly it's his innovative use of computer visualization, simulation, and modeling. Using algorithms and specific software applications, Dr. Johnson studies things like epileptic seizure activity and the body's response to a device implanted near the heart. Dr. Johnson teams with medical and technology specialists to resolve real-life problems. A few years ago, Dr. Johnson joined with John Wright, founder of a high-tech graphics company, to create a simulation and 3-D image of young Natalie Wright's brain and recently diagnosed tumor. What they created was an 8' x 10' view of Natalie's tumor and vital brain cells. Wearing 3-D glasses, neurosurgeon Dr. Jack Walker visually stepped inside Natalie's brain and planned the surgery he would later perform. Dr. Johnson founded the Scientific Computing and Imaging Institute at the University of Utah, and in less than a decade has received awards and honors from the National Science Foundation, the National Institute of Health, the Smithsonian Institute, as well as the Governor's Medal for Science and Technology.