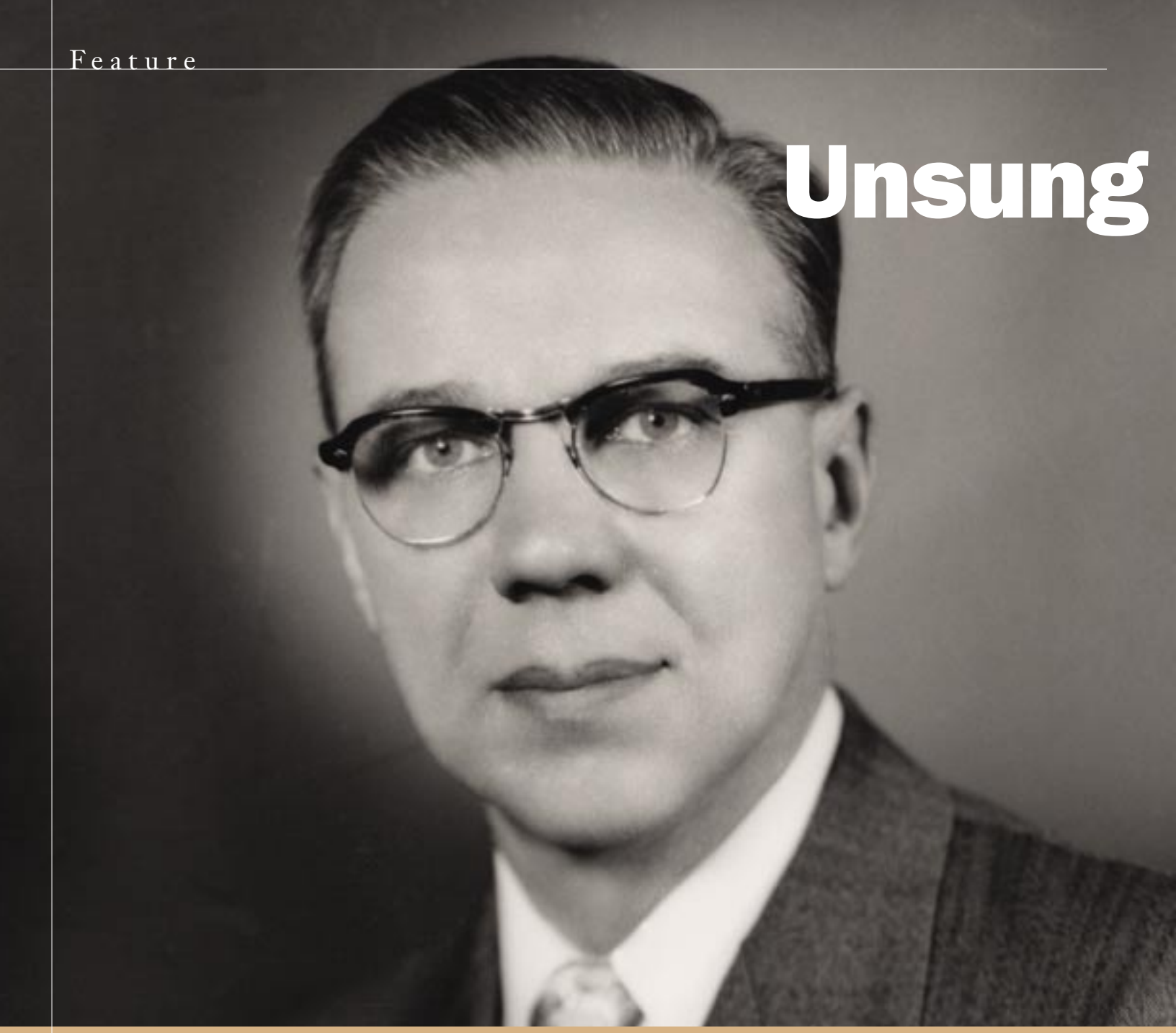
Unsung



"I'm standing on the shoulders of giants," says Charles Rinaldo, paraphrasing Sir Isaac Newton. Rinaldo is the fourth chair of the Department of Infectious Diseases and Microbiology. One of the giants to whom Rinaldo is referring is the department's first chair, William McDowall Hammon.

William Hammon

Hero of the War on Polio

Hammon was a major figure in the war on polio in the early 1950s. (Rinaldo refers to him as one of the "Big Three" along with Jonas Salk at Pitt's medical school and Albert Sabin of the University of Cincinnati.) But Hammon's contributions were eclipsed in the public eye by Salk, and then Sabin, and subsequently forgotten by all but a few. Last year—the 50th anniversary of Hammon's important breakthrough in fighting polio—Rinaldo decided to learn more about Hammon's legacy. The result is a narrative article, expected to be published in 2004, that places Hammon's achievements in the context of public health history.

Thomas Parran, founding dean and former U.S. Surgeon General, recruited the best and the brightest to head up the six new departments of the school. At age 45, Hammon, then on the faculty at the University of California at Berkeley, had already achieved eminence as an epidemiologist and microbiologist. A graduate of Harvard University's medical and public health schools, Hammon and John Enders, a colleague and future Nobel laureate, had developed the first vaccine for feline panleukopenia before Hammon turned his attention to the poliovirus.

As Rinaldo delved into Hammon's published journal articles, he found himself impressed by the keenness of Hammon's intellect as well as by his scientific discipline. The logic for his approach to combating the polio epidemic was laid out in a 1949 speech Hammon made at the annual meeting of the American Academy of Pediatrics. "Hammon based his reasoning that antibody was protective against polio on his post-war research in the Pacific Island of Guam," writes Rinaldo. "He noted that the last reported outbreak of poliomyelitis in Guam was in 1899. An outbreak of poliomyelitis in 1948 on the island was restricted to Americans. He found that serum from indigenous Guamanians had neutralizing antibodies to poliovirus. He reasoned that this immunity was due to natural infection with viruses that persisted in Guam, and was protecting the children from developing the disease."

Hammon developed a hypothesis involving passive immunization to temporarily prevent infection through the administration of gamma globulin shots in the early phase of an outbreak. The role of antibodies in immunity to poliovirus was still uncertain. Hammon's supposition was that while passive immunity would not prevent infection, it would prevent clinical disease and could possibly confer long-lasting immunity such as he found in the children in Guam. Hammon made his case and in 1951 began the first field trial of 5,000 children to test his theory. His study would eventually provide the first evidence that antibodies to poliovirus could prevent the disease in humans.

"The placebo-controlled clinical trial was new to the field, and this particular one where he used the gamma globulin for polio was very important to set the stage for Salk to use an inactivated virus vaccine to induce such antibodies, which then provided permanent protection instead of temporary protection," says Rinaldo. "The scientific discipline of his approach stands as a major legacy. He was a true classic research scientist. He would not do a study without every single control in place and without the right numbers of individuals to give you the proper answers."

Rinaldo notes that Hammon insisted on a one-to-one match of vaccine to placebo. "His study on passive immunity to poliovirus would be one of the first major double blind, placebo-controlled clinical trials," he writes. "Such trials are the standard today. Other important factors Hammon carefully addressed included the type of control inoculum (autoclaved Knox gelatin), source and dosage of gamma globulin from pretested Red Cross pools, public school locations to allow for large numbers of subjects, specific site of administration of the injections in the right buttock, utmost statistical rigor applied by Anthony Ciocco, Chairman of Biostatistics at the GSPH, a written informed consent, selection of a relatively restricted geographical area, approval by the local population and medical community, publicity and preparation of the clinics, and finally, follow-up studies."

Hammon would mount three clinical trials between September 1951 and July 1952, enrolling and vaccinating an astounding 54,772 children with encouraging results. In the meantime, Salk was beginning his first clinical trial with the inactivated vaccine that would become the treatment of choice, until it was replaced in 1961 by Sabin's live attenuated oral vaccine. Still, the gamma globulin field trials made a significant contribution in polio prevention, demonstrating, as Hammon wrote, "that a very low concentration of antibodies will protect man."

For Rinaldo, as he followed Hammon's story through journal articles, oral history, and even in the popular press, there was a "natural affinity" to his predecessor. "There were a lot of parallels with the polio story of the late 1940s and early 1950s to what I've seen in my career with HIV and AIDS," he says. "I look to history to help me look to the future."