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A replica iron lung teaches a new generation about polio

Dispatched to Ghana with a fellow British Rotarian to scout club service opportunities, Roger Frank hadn't planned their visit to coincide with National Immunization Days, but the pair – Frank and Dr. Carl Hallam – jumped, unhesitating, into the thick of inoculations. During a four-day stretch in October 2015, nearly 2,000 children in the area were protected from poliomyelitis. The effort galvanized Frank, who brainstormed for a way to do even more at home: How could he promote polio eradication when few of his countrymen gave much thought to the scourge?

Recalling the fear that gripped the UK, the U.S., and elsewhere during the height of

the polio epidemic in the early 1950s, Frank, a past president of the Rotary Club of Upper Eden, thought of the iron lung, a device largely relegated to museums and history books. The lifesaving mechanical respirator was a potent, if depressing, symbol of the debilitating disease. An iron lung, Frank reasoned, would educate younger generations who grew up free of the fear created by polio, a virus that is spread easily, during the 20th century.

He hoped to borrow a model to put on tour to serve as a reminder that the polio fight remains unfinished. "I spent the last three months of 2015 looking for an iron lung in hospitals, etc.," says Frank, 65. "I had hoped to source an

original unit, but they have all been scrapped and those that remain are in museums, and they would not part with them. Being fully committed to the project, I had no other option than to build an iron lung myself.

"This proved quite a challenge," even for a retired mechanical engineer and self-described "nut and bolt man," particularly after he resolved that only a fully functioning machine would do. "I learned many years ago that the dafter the project, the easier it is to get good publicity for the cause," he quips.

Using the outline dimensions of a unit in the Thackray Medical Museum in Leeds as a reference, Frank rolled and welded steel for a

cylindrical main chamber, fabricated tracks for a mattress that slides into and out of the unit, and cut access doors and windows. "I cajoled various local companies into assisting with the project," he says, particularly painting the unit and a trailer used to transport it; Upper Eden club members also assisted. "I suppose in some ways people are used to my hare-brained ideas, and not one of them declined to support the project," he adds. Frank, who bore most of the construction costs, concedes that most of the 650 hours he spent over four months on the heavy metal labor of love were devoted to the trailer, itself a showcase worthy of a Rolls-Royce Phantom.

"To finish the job, he then created visual displays to fit into and onto the trailer, including a television program of iron lungs being used 'for real,'" notes Ben Lyon, the club's immediate past president. "The finished result is a stunning promotional and educational tool in aid of polio eradication." Onsite, a computer-controlled sequence activates the lung, in thumps and whooshes, for five minutes before triggering a YouTube video about iron lungs.

For many polio patients, the apparatus was crucial to surviving the disease's early stages, when their muscles were too weak, or paralyzed, for independent breathing. The life-saving mechanical respirators were a common sight, lined up in rows at hospitals. The stricken, mostly young children, were confined in the chambers, normally for at least two or three weeks, exposed only from the neck up, with mirrors above their heads providing their only glimpse into the world around them amid the machines' cacophony.

"As a static exhibit the lung is lifeless and really comes alive when the motor starts and the end bellow operates. I think it really helps give people an understanding of how it would be to be locked in," Frank says. "Also the drive unit, or mechanism, is quite noisy and adds to the atmosphere, just as the original units did."

Frank, who notes that his replica has been booked for the Rotary International in Great Britain and Ireland conference in April, makes the display

available to Rotary clubs that agree to arrange transportation and staff it to raise funds and awareness for End Polio Now. It has been deployed to agricultural shows and schools, with area club members staffing the unit.

"Most people, especially young ones, are totally dumbfounded by the whole spectacle, and after watching the video are mesmerized and stand motionless for quite a few seconds," says Frank, "I suppose in awe, or taking in how somebody could spend [nearly] their entire life in such a machine."

On occasion, a "lucky" visitor might be invited inside the lung. Sara Dumbell, a journalist with BBC Radio Cumbria who reported on the project, says: "I get sent on many exciting jobs, but getting to see a real life-size replica iron lung was a first for me. The iron lung itself was hugely impressive. I'm 28, and so the major UK outbreaks of polio were a little before my time, but it was deeply moving to learn about how so many children across the world were forced to live in these machines."

"I couldn't leave without trying out the iron lung for myself, but having the metal lung separating your head and body at the neck I found to be the most uncomfortable feeling," she adds. "I must admit I was quite relieved when I was allowed out."

With a nod to the red End Polio Now donation buckets at the ready, Frank says, "I kid people that it is £1 to get into the unit and £50 for me to let you out."

— BRAD WEBBER



OPPOSITE: Roger Frank crafted the trailer to give his iron lung a setting that would educate people about polio past and present. THIS PAGE, FROM TOP: Frank put his engineering background to good use, rolling and welding all the steel components himself; the display serves not only to educate and raise awareness, but also to inspire people to donate; for many visitors, the iron lung exhibit makes a connection to the history of polio.