

Dr. Ernst Kiesling – Father of the Safe Room

In 1854, 67-year-old Johann Kiesling decided to leave his home and head for Texas on the *Ben Nevis* with about 600 others to make a new home and start a new life. Johann brought with him his wife Hanna, age 57, and their three children: Johann, age 22; Magdalena, age 18; and Ernst, age 15. Johann and his wife Hanna did not survive the trip. They died from cholera in Queenstown, Ireland, Johann on October 17, 1854 and Hanna the following day. All three children survived and raised families. However, this story is not about them; it is about another Kiesling – Dr. Ernst Kiesling - who takes survival very seriously. Dr. Ernst Kiesling, a great-grandson of the Kiesling's youngest son Ernst, has been called the "Father of the Safe Room." I became aware of Dr. Kiesling while searching for patents held by the *Ben Nevis* Kiesling family. Dr. Kiesling was very courteous and responsive to me when I contacted him to inquire if he was related to the *Ben Nevis* Kieslings. It was with his help that I was able to compile the information for this article.

Dr. Ernst Kiesling studied mechanical engineering, receiving his Bachelor's Degree in 1955 from Texas Technological College in Lubbock, Texas (now Texas Tech University), his Master's Degree in Applied Mechanics in 1959 from Michigan State University, and ultimately his Doctorate in Applied Mechanics in 1966, also from Michigan State University. Dr. Kiesling went on to teach and conduct research at Texas Tech University.

In 1970, a strong tornado struck Lubbock, Texas and Dr. Kiesling and fellow faculty members studied the damage from the tornado to learn more about tornado wind speeds, wind-induced damage, and to determine ways to counteract the winds. On March 10, 1973, Burnet, Texas suffered severe damage from a tornado. There were no deaths in Burnet associated with the tornado, but thirty people were injured in the town of 3,500 and 300 homes and businesses were destroyed, along with a school¹. Dr. Kiesling and his team went to Burnet to survey the damage, and came across a home that was severely damaged but that had a small pantry near the center of the home with all four pantry walls still intact. This is when the idea of an above-ground storm shelter was born.

On April 3, 1974 an F5² tornado struck Xenia, Ohio killing thirty-three people and injuring over 1,300. The tornado damaged or destroyed 1,200 houses, many businesses, ten churches and several schools. There were 148 tornados that struck several

states over the course of two days with Xenia, Ohio suffering the worst damage³. Dr. Kiesling's team went to Xenia, Ohio and there, amidst the rubble, they found an interior bathroom intact. The above-ground shelter idea continued to evolve. Dr. Kiesling and graduate student David Goolsby presented the concept in the magazine *Civil Engineering* in 1974.

Dr. Kiesling and his team at Texas Tech University determined that tornadic wind speeds were not nearly as strong as previously thought. (At one point, it was thought that tornados had wind speeds in excess of 600 miles per hour.) The team designed a shelter that could withstand wind speeds of 250 miles per hour, higher than the ground-level wind speeds observed in any of the team's post-storm inspections.

In 1975, Dr. Kiesling built a storm shelter in his own home and opened it for public inspection. He and his colleagues continued to research wind- and storm-related damage, trying to find shelter designs that were inexpensive but could save lives. Dr. James R. McDonald developed a missile impact facility that could launch large 'missiles' at high speed, and Kiesling's team used McDonald's facility to test their shelter designs for debris impact resistance. The resulting shelter designs were made available for public use.

Jarrell, Texas, with a population of 410, was struck by an F5 tornado on May 27, 1997, killing twenty-seven people and destroying all 38 homes in the Double Creek Estates subdivision⁴. Media coverage of the storm included information about aboveground shelters and within one week, Texas Tech University's Wind Engineering Research Center - of which Dr. Ernst Kiesling was a part - received over 1,000 requests for shelter plans.

In October 1998, the Federal Emergency Management Agency (FEMA) published a booklet entitled *Taking Shelter from the Storm – Building a Safe Room Inside your House or Small Business* that included the team's residential designs. This booklet became known as FEMA 320 and was revised in 1999, 2008 and 2014 with contributions from Dr. Kiesling. Over one million copies have been distributed and many more have been downloaded from the web⁵.

On May 3, 1999, Oklahoma City was struck by an F5 tornado. One storm shelter survived the storm and received as much publicity as the storm damage. At that point, many companies were build-

ing storm shelters, but not all were high quality because standards did not yet exist for construction of storm shelters. Within a year following the Oklahoma City tornado, over 20 companies had their storm shelters tested at Texas Tech University for debris impact resistance. Dr. Kiesling invited companies to Texas Tech to address the issue of quality in the storm shelter industry. The National Storm Shelter Association (NSSA) was formed in order to promote quality in storm shelter designs and to develop industry standards for aboveground shelters. In 2001, Dr. Kiesling was appointed as Executive Director of the NSSA, a position that he still holds today.

In May 2002, the NSSA agreed to develop a national standard for storm shelters with the Southern Building Code Congress International, incorporated into the International Code Council. At the 2008 Structures Conference in Austin, Texas, Dr. Kiesling and Mark L. Levitan presented "Design and Construction of Storm Shelters – Introducing the New International Code Council (ICC)/National Storm Shelter Association (NSSA) Standard" at a pre-congress seminar. It was later accredited by the American National Standards Institute (ANSI) and became known as ICC 500. The ICC 500 was updated in 2008 and again in 2014; the current edition is known as ICC 500-2014.

Dr. Ernst Kiesling is also a partner in the Federal Alliance for Safe Houses (FLASH). He was featured in the FLASH "Partners in Prevention", March 2017 issue (Volume 19, Issue 3). Dr. Kiesling continues to work with FLASH, FEMA, the ICC and the NSSA.

Dr. Ernst Kiesling, a great grandson of Ernst Kiesling who survived the cholera outbreak on the *Ben Nevis* in 1854, has helped many people survive with his past and present work with regard to aboveground storm shelters. We thank him for his 50 years of work and are proud of all he has done for others.

Notes:

1. *Chicago Tribune*, "Tornados Rip 8 Texas towns – 4 killed", March 11, 1973, <http://archives.chicagotribune.com/1973/03/11/page/1/article/tornados-rip-8-texas-towns-4-killed>.

2. Meteorologist Ted Fujita devised the Fujita Scale as a way to measure maximum winds within a storm based on the damage caused. The scale goes from 0 to 5 with 5 being the most severe. An F5 tornado estimates wind speeds to be between 260 miles per hour (mph) and 320 mph.

3. *Dayton Daily News Archive*, "Xenia Tornado of 1974", <https://www.libraries.wright.edu/special/ddn/archive/2011/04/19/xenia-tornado-of-1974/>, April 19, 2011.

4. Wikipedia, "1997 Central Texas Tornado Outbreak".

5. National Storm Shelter Association, "History of the National Storm Shelter Association - Major Milestones", August 2015.

Frank Wissel

Texas Wendish Noodle Recipes Cookbook!

The first edition of the *Texas Wendish Noodle Recipes Cookbook* is now available for purchase! Included in this first edition are 22 recipes that illustrate the variety of ways in which Wendish noodles can be used, such as German Style Ham, Noodles & Cabbage Casserole, Quick and Easy Two-Way Casserole, or Creamy Chicken Noodle Soup. The first printing sold out at Wendish Fest, and we are now on our second printing. Order your copy today – cost is \$5 plus \$2 shipping – and order extra copies to give as Christmas gifts and stocking stuffers!

Visitors

During July, August and September, the museum hosted visitors from Louisiana, South Carolina, Maryland, Slovakia, Norway, Germany, New York, Tennessee, Virginia, California, Brazil, Washington, and cities throughout Texas.

Docents

During July, August and September the following volunteers served as museum docents: Apryle Kappler, Ruby Koslan, George Boerger, Amelie Boerger, Jan Slack, Bettie Horn Bende-wald, Travis Urban, and Kevin Ziehr.