



WWI & the Flu Pandemic: Immunology

Until recent publications the 1918 flu presented two unusual problems that were never fully understood. The age of those affected and the extreme number people who died from the flu.

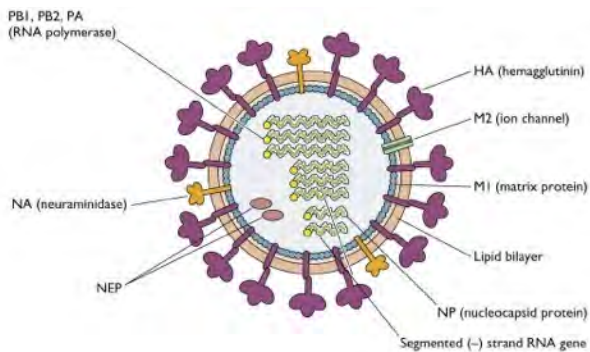
The 1918 flu pandemic seemed to affect people in the prime of life. The age bracket that suffered the most was said to be between 20 and 40 years old. Recent publications suggest an age group from age 25 to 30 years old. Prior to 1918 and after 1918 the population age most effected by the flu was the very young and the very old.

This article shows us why the age group 20-30 suffered from the 1918 flu and those age groups—the very young and the very old— did not suffer from the flu.

The other puzzling affect of the 1918 flu was the extreme number of people who died resulting from this pandemic. Many consider this flu epidemic to have two or even three phases of involvement. The

first phase was relatively mild. The second phase was noted in the fall of 1918 when the flu was reported to have returned to the United States in a more virulent manner killing many people. It was said that people were healthy in the morning and dead by night. One common belief was the virus had mutated in Europe and returned to the United States. The virus was more virulent. The disease and the immunological system of the host created a lethal storm within the patient. The third phase returned later in the year. It was not nearly so severe as the flu in the fall of 1918.

Although viruses were known before 1900, not much was understood about them. In the late 1990's genetic sequencing of viruses began to have a significant effect on understanding viruses. These studies, and the development of a molecular clock to help determine growth rate and development rate within various animals, has allowed scientists to determine when certain viruses developed and their pathogenicity.



In 2014, Dr. Michael Worobey, a professor of Ecology and Evolutionary Biology at Arizona University, was filmed discussing the origin of the 1918 flu virus, and why it was so severe on young adults aged 20-40 and in particular those between 18-30. His work suggest that the H1N1 virus, the virus responsible for the 1918 flu, just didn't jump into humans in 1918, but existed at a low level for about 7-10 years previous to 1918. Furthermore, the severity of the flu was from a mismatch between the surface antigens (H & N) of the virus and prior immunity of the host in certain age groups. One thing! Most people are infected with a flu virus by age 5 and this event determines a person's immunity to the flu for life.

This photo is a diagram of a virus. Note the HA and NA figures. The HA is what allows the virus to enter the cell and the NA is what allows it to leave the cell. Without out these the virus could not function as id does.

For those wanting an in-depth look at this research on immunology and H1N1 viruses, watch Dr. Worobey's YouTube presentation, "The Genesis of the 1918 Spanish Influenza Pandemic."

It seems, according to Dr. Worobey, that within each 100 year period generally there are three pandemics in the world due to flu viruses. The 1918 flu virus was known as H1N1. **Those born before 1957 have immunity to the H1N1 Virus.** The H and the N (see diagram) are two surface proteins that are involved in the immunology of various flu viruses. The H is a Hemagglutinin protein and the N is a Neuraminidase protein. The H is what allows the virus to enter the host cell and the N allows the new viruses within the host cell to exit.

AFIP (The Armed Forces Institute of Pathology, which is no longer functioning) had specimens dating back to the Civil War and in 1997

a virologist, Dr. Peter Hultin went to Brevig Mission, Alaska to gather lung tissue from a mass grave where in 1918, 90% of the town was buried due to dying from the 1918 flu. From this tissue Jeffery Taubenberger and his scientists were able to determine the entire genome of the 1918 flu virus.

Also, using pathology specimens from AFIP, Brevig Mission, and other sources, it has been possible to identify the various pandemic flu viruses which explains clearly why this disease in 1918 was so destructive to young adults. These young adults had no immunity to the H1N1 virus. Below is an attempt to demonstrate this.

From 1830 to 1847 the prevailing flu virus was H1N1. In 1918 these people were in their 70's and 80's and they had full immunity.

From 1847 to 1889 the prevailing flu virus was H1N8. In 1918 these people were 30 to 70 and because the had been exposed to the H1 protein they had partial immunity.

From 1889 to 1900 the prevailing flu virus was H3N8. In 1918 these people were 18-30 and THEY HAD NO IMMUNITY to the H1N1 flu virus. Consequently they suffered severely.

From 1900 to 1918 the prevailing flu virus was H1N8. In 1918 again these people were under 20 and they had partial immunity.

Those in the military were under severe situations that would lower one's natural immunity and thereby allow any disease or infection to be more severe. Those military personnel in the trenches suffered from the flu, but because the military did not want that information public, the figures were secret.

UPCOMING 4TH TUESDAY EVENTS

July 25—No program because of the Leavenworth County Fair.

August 22—To be determined

Sept 26—MARK THIS ONE ON YOUR CALENDAR.

Dr. Brad Logan, Professor of Archeology at Kansas State University will discuss the Kramer Collection of prehistoric Indian Artifacts that were found in the Wildhorse/ Nine Mile Creek area. Dr. Logan's students in the fall of 2016 meticulously cataloged over 800 artifacts in the collection

Aspirin, the Flu Pandemic, and WW1



In 2009 Karen Starko, MD, published a paper where she suggests that aspirin may have played a significant role in the death of people suffering from the 1918 flu.

It wasn't until the 1960's that pharmacologists began to seriously study how aspirin worked. It is a very complicated drug. In 1968 a graduate of Nebraska School of Pharmacy told me that if Aspirin were to come on the market today it probably would not be over-the-counter.

Today we understand that aspirin has some serious side effects and it can be toxic if given in large doses. We know that those having major surgery must stop aspirin therapy a week or more before surgery. Children don't get aspirin in flu like situations because it can cause Reyes syndrome, and those with Von Willebrand's disease are very sensitive to aspirin caused bleeding. **For aspirin today the maximum suggested dose per 24 hour period is 4,000 mg.**

In 1918 and before, not much was known about aspirin. It was beneficial to reduce fever, aid in relief of arthritic pain, the relief of headaches pain, and relief from somatic pain. However, toxic effects of aspirin were not really understood.

In 1899 Aspirin was patented by Bayer, a German chemical company. In February 1917 that patent expired. By 1918 many generic drug companies jumped on the aspirin bandwagon to make a profit in the aspirin market.

So during WW1 this is what we have:

1. Aspirin was inexpensive. It was produced in large quantities and sold world wide.

Because aspirin had become generic, India had inexpensive aspirin (see Starko's previously mentioned article for more info). The people of India suffered from the flu in great numbers. Death rates were high. Karen Starko was challenged by three physicians to explain this high death rate since it was thought India did not have access to aspirin due to the expense. Dr. Starko responded in a 2010 follow-up that India did have inexpensive aspirin as everyone did, and they used it as a tablet to be swallowed. They also used aspirin in some unusual ways such a gargling.

2. People were afraid of the 1918 flu, and aspirin offered help by reducing the fever and the pain. It made them feel better even if they weren't.

3. Physicians did not understand aspirin, and the officially prescribed doses of aspirin in 1918 are considered toxic today.

In 1918 there were no guidelines on management of aspirin toxicity. There were few directions on the aspirin bottles about doses, and there were no recommendations for the amount of aspirin prescribed. **One physician prescribed a handful of aspirin every hour. Another gave 1300 mg hourly.**

The American Medical Association recommended 1000 mg every three hours or until symptomatic relief was achieved. The bottom line; daily doses prescribed were 8,000 mg to 31,200 mg.

Considerably higher than the 4,000 mg recommended today.

In addition there is today a known variable involving aspirin (not known in 1918) in that individual responses to normal aspirin doses can vary significantly which can result in toxic doses. Also low doses of aspirin given for many days may in some people accumulate to a toxic dose.

4. Aspirin was heavily advertised in August of 1918, and the American Medical Association, the U.S. Surgeon General and the U.S. Navy all recommended aspirin in high doses.

5. *Aspirin sales doubled and sales peaked just before the death rate increased from the flu.*

This rise in aspirin sales and the increase in flu deaths seem to be so overlapping and similar that it strongly suggests a direct relationship between aspirin sales and death from flu. The death rate increased sharply in the United States. It peaked first in the Navy in late September. It peaked in the Army in early October. The general population peaked in late October.

6. Holistic medical personnel did not seem to have deaths related to the flu. Aspirin was considered a poison and it wasn't prescribed. It was said that those patients who died in their practices were those that came to them after they had already taken aspirin.

7. The very young did not die from aspirin linked to the flu, because the pediatric textbook's recommendations for fever management was cold water baths.

During the 1918 flu pandemic two types of conditions were described. The first was considered an early death that upon postmortem revealed a "wet" look. A person dying in this situation exhibited lung congestion, purpuric rash (usually means bruising and/or bleeding) and no bacteria. Some pathologists described the situation as unusual.

One pathologist described the amount of lung tissue involved with pneumonia "too little to explain death". The pathology reports noted thin, watery and bloody liquid in the lungs, like the lungs would exhibit on a drowned victim.

The second condition has been described with those who died "late". It was often referred to as a "Superinfection". Those people who were sick for several days usually died of a bacterial infection.

The pathology noted above has been described with people who died from the flu in 1918, and it is also noted to be consistent today with death due to aspirin toxicity.

The salicylates can cause lung toxicity. The pathology of aspirin toxicity demonstrates pulmonary edema, hemorrhagic lungs, and petechial changes in the lung. Salicylate can produce increased lung fluid, increased protein levels and reduce mucociliary clearance. Increased lung fluid and increased protein levels aid in bacterial growth. The ciliary fibers in the respiratory tract help to remove foreign material and keep it out of the lungs. When ciliary fibers don't work correctly this aids in bacterial growth in the lungs. In addition the immune system's

effectiveness has been reported to be reduced with aspirin toxicity.

Dr. Karen Starko quotes several different sources in her article that describe pathology associated with only aspirin toxicity. Cyanosis, pulmonary congestion, alveolar hemorrhage, subplural and subepicardial hemorrhage, petechiae, etc. are all noted in aspirin toxicity.

The point Dr. Starko makes is the pathology noted on autopsy in the 1918 flu pandemic is very similar to that found on autopsy from those who died from known aspirin toxicity.

The actual number of people who had a negative effect with aspirin therapy in their treatment for the flu will never be known. Dr. Karen Starko, however, does make a very compelling case that aspirin had a significant impact of the outcome of people suffering from the 1918 flu pandemic, which may have contributed to the high number of deaths.

FOOD FOR THOUGHT

The Value of History, from the History Relevance Campaign, sponsored by the American Association for State and Local History. This month, we will look at two of the seven ways that History is Essential.

To OURSELVES - IDENTITY: History nurtures personal identity in an intercultural world. History enables people to discover their own place in the stories of their families, communities, and nation. They learn the stories of the many individuals and groups that have come before them and shaped the world in which they live. There are stories of freedom and equality, injustice and struggle, loss and achievement, and courage and triumph. Through these varied stories, they create systems of personal values that guide their approach to life and relationships with others.

To OUR FUTURE – LEADERSHIP: History inspires local and global leaders. History provides leaders with inspiration and role models for meeting the complex challenges that face our communities, nation, and the world. It may be a parent, grandparent or distant ancestor, a local or national hero, or someone famous or someone little known. Their stories reveal how they met the challenges of their day, which can give new leaders the courage and wisdom to confront the challenges of our time.

MEMORIAL DAY BREAKFAST



On May 29, Memorial Day, from 8 AM to 11 AM, TCHS hosted a Biscuit & Gravy Breakfast. The idea for the event came from two people - Ray Stockman, who had suggested doing something on Memorial Day several years ago, and Dennis Bixby, who offered to make the biscuits and gravy. By every measure, it was a success. We had visitors who came because they heard about the event and had been meaning to come to the museum anyway.

The Mo-Kan Antique Engine Show was a good addition to the day and it was good to welcome them back for a third year in a row. Mel Ramseier does a great job of getting this group to come to our site. Many thanks to Dennis Bixby who got up in the wee hours of the morning to make the biscuits and gravy. It is my understanding that the biscuits and gravy was entirely gone by noon. And many thanks to the VFW, who started the morning with a flag ceremony.

This was truly a community event. Let's do it again next year!

BIKING ACROSS KANSAS



Every June for over twenty years, bicyclists have been making their way across Kansas from the Colorado border to the Missouri border. This year, they stopped overnight in Tonganoxie on June 16, the last day of their trek across the state.

The community welcomed the cyclists. TCHS opened the museum and had a drink and baked goods concession at the high school where the cyclists arrived in the afternoon. A few visitors came



to the museum, and we sold some drinks and cookies. Many thanks to

all of our members who baked cookies and brownies for this event.

We had some

leftovers and we have put them to great use – the picnic, the science camp (see separate story), and feeding the Wednesday morning volunteer

SHOW & TELL

The April 25 program was homegrown. Members brought in treasures from home – from an 1872 photo of Gladys Walters' paternal grandfather and 1951 Royal Theater bill to unidentified tools

and Jean Pearson's collection of Kansas City Star Quilt Patterns, which were published from 1928 to 1961. Janet Burnett brought in a civil war pistol and Connie Putthoff treated us to a history of TCHS.

Show and Tell is always entertaining and thoroughly enjoyed by those in attendance. It is something that all of us can do.



The photo below shows Larry Deaton with his baton. He was probably the first male baton twirler in



Tonganoxie. He is still using his baton as a prop in many of his lectures on motivation. I personally consider him the Will Rogers of our class.

SODA FOUNTAINS

The [May 23](#) program was brought to us by the Kansas Humanities council. Cindy Higgins, a local historian and journalist from Eudora, took us on a journey around Kansas to look at pharmacies. Along



the way she regaled us with stories of tonics, fountain treats, and cure-alls. She even found a photo of a soda fountain syrup pot that is in our museum! The evening finished out in the spirit of soda fountain fans everywhere – with ice cream floats.

PICNIC

The annual picnic was held on [June 17](#) at the historic site. Jena & Lloyd Pearson and Kathy & Ray Stockman hosted the picnic. Don Fuhlhage received the Distinguished Service Award that night.

“Don just last year stepped down from serving six years on the Board of Directors as Treasurer. The job of Treasurer is no small one. From picking up the mail and distributing it, to staying on top of the costs and receipts and day to day costs of running a museum and historical society with an annual budget in excess of \$25,000. Then there are the yearly

filings with the federal government and the interface with our accountant, the filing and paying of sales taxes on fundraising events, keeping the board informed, and keeping our non-profit status intact.

“When interest rates went down, Don was concerned about the state of the society’s funds. He sought to improve the return while keeping the investments safe, as the board had wanted. Don found a no-risk annuity that delivered better interest and he acted on it. We thank him for that.

“And we miss Don’s always smiling, always agreeable countenance. His sense of humor was wonderful – board meetings need board members with senses of humor. Thank you, Don, for years of service and friendship.”

SCIENCE CAMP

The historical site was a busy place during the mornings of the week of [June 26](#). The Science Club, under the auspices of John Tollefson, held a STEM (Science, Technology, Engineering, and Mathematics) summer camp for about 30 students from the 1st through 3rd grades.

Utilizing the barn and the schoolhouse for short classes and experiments and projects, 10 to 12 high school students kept 30 youth on task. They had scheduled every bit of the time down to the minute. Of course, the children were allowed to relax too and the playground and grounds were a perfect setting. It was a great use of the historical site to host this camp – and such a pleasure to hear the sound of joyful children.

BASEBALL CONCESSIONS

Is anyone feeling like they are missing out on something this summer? We handed over the management of the concessions stands this year to John Tollefson and the High School Track team. They seem to have done quite well with them. They shared the responsibility for manning the stand with other high school clubs.

We are grateful for the income that the stands provided for many years and for the opportunities that we members had to interact with the community. But, we are also pleased that high school clubs will now benefit from their involvement.

GIFT SHOP

Our museum gift shop has a whole new look and feel. Using wooden apple crates, milk cans, and antique merchandise shelves, Dan Carr has crafted a display for our gift shop items that is eye-catching



The Gift Shop's new look

and so functional. Don't miss the very unique coat rack, which was crafted from bannisters from the Fairchild house. Stop by to check out the gift shop and new exhibits in the museum!

Fourth Tuesday Hosts & Hostesses:

July 25—No meeting: Fair time.

August 22- J.W & Ferry Evans and Rachel Kelly

September 26- Arlene Meyer and Theresa Megee

Freedom's Frontier Meeting

The Freedom's Frontier Partner Meeting that was hosted by TCHS on [May 11](#). Forty people attended from museums in Kansas and Missouri, from the state line to the Flint Hills.

The program included several informational sessions about Emergency Preparedness, the Deaf Cultural Center in KC, and a presentation on the StEPS



program, a self-guided manual for the enhancement of museums and historical sites.

Nearly all of the attendees stayed after the meeting to tour the museum. TCHS is a member of Freedom's Frontier, which is a group of 214 historic sites which share the goals of promoting the history of shaping the frontier, enduring struggles for freedom and the border war.

HIGH SCHOOL WORK DAY

Wednesday, May 3rd brought Matt Beat and seventeen high school students as volunteers for a morning work 1/2 day. Unfortunately it was raining off and on. However the students and the historical society volunteers persevered and were able to accomplish a good number of chores. Old Fluorescent light fixtures were carried from the church basement to the fire station where the bulbs



were removed and placed in storage. Other students washed artificial flower bouquets to be recycled and used for our memorial day breakfast in the future.

Some moved large furniture items in the museum, proof read the signs on the railroad exhibit and provided constructive criticism for the display.

Other students carried items from the attic in the barn to a trailer outside for removal. Others carried items to the upper storage area. A learning station was set up for student to use in seeing how printed material was catalogued and archivally stored. Another group of students painted signs to be used for our sausage and biscuit breakfast on memorial day.

All in all, the rain did not deter the group and the time flew by. The group seemed to enjoy the morning. The Oreo cookie snacks did help a bit.

Ancient Artifacts from Local Territory

Humans have occupied areas in Kansas for many centuries and we have a donation from the Frank Kramer, Jr. family with over eight hundred items used by **prehistoric** inhabitants from 800BC to 1500AD. "Junior" Kramer and his four sons have collected for more than fifty years and the family felt that their collection should be both preserved and shared with others and not sold for commercial gain. Thankfully TCHS is the repository chosen for these items.



Kansas State University organized an archaeological dig at this site and have provided the expert identification and information which accompanies this donation.

These artifacts are from the Steed-Kisker people who inhabited the tributaries of the Missouri and Kansas rivers and their tributaries which include

Nine Mile Creek and Stranger Creeks in Leavenworth and Jefferson counties. Other sites lie along the Missouri river border to the east. Their time frame is from 500BC to 1500AD. This population was a semi-nomadic group which gradually learned to make pottery and plant horticulture crops. Crops were at first the wild weeds such as burdock and sunflowers and led to corn and beans.

It is unknown if the Kramer site was a permanent site or seasonally occupied. The great quantity of Toronto chert projectile points and the many sherds show evidence of flint knapping (the process of making stone tools) at this location. Toronto chert (similar to flint) is abundant in the limestone outcroppings along this creek. Among the stone tools are awls, drills, projectile points (both for arrows and for darts and spears), hatchets, grooved axes, and *manos* (grinding stones).

There is an abundance of pottery sherds which are from more than one culture group suggesting that multiple groups have used this area over time. Pottery is a significant indication that the people are not totally nomadic, Think of the convenience of a pot for cooking rather than a hide bag in which to boil or a stake for skewering meat. The pots were difficult to carry by hand and are an indication of a settled existence.

Identification of the many projectile points confirms that this site appears to have been inhabited periodically throughout much of the Holocene (11,700 years ago), particularly from the Late Archaic (4500 years ago) through Late Prehistoric time (1700AD). The various projectile points and knives are typical of those used in the Early Archaic, Late Archaic, Woodland, Late Prehistoric, and Historic periods. This shows the site was inhabited from 8000BC through the present day.



The oldest item in the collection is the Hardin Barbed projectile point in the photo at left. It was probably used on a spear and is not commonly found in this area. It is dated at 8000 BC.

The pottery sherd shows a rim and handle and is Pomona ware. The vessel was tempered by crushed shell. Little decoration is evident on this sample.

Our museum exhibit of this collection is under construction with the hope to be completed by September. We are proud to be the repository for the Kramer family and thank Barbara Kramer for her kindness in locating photographic material and so generously sharing her time in this project.



The Tonganoxie Days Committee has disbanded

As the City of Tonganoxie has taken over the Tonganoxie Days festival, the Tonganoxie Days Committee has disbanded after thirty years. In the process of so doing, it was felt that the funds left in the Tonganoxie Days account should be put to use helping the Community. A portion of these funds were donated to the Tonganoxie Community Historical Society. Funds were also donated to Team Tongie, a local organization that has helped many in Tonganoxie, especially students of USD 464.

It is hoped that these funds donated to TCHS will help further the work of the Historical Society.

TCHS received a check for over \$920.00. It will be put to use. TCHS is thankful.