

Histories

Unit 5 of 5

Vaccines have been around for hundreds of years. There have also been diseases to combat, doctors who like to experiment, and nations that need a way to protect their people. The method has changed over the years, and like any major advancement, has faced opposition across the ages.

VACCINATION

The first method of vaccination was called "variolation" or "inoculation". The idea is simple: take a scab, or infected area, of an individual who was recently variolated/inoculated and showed mild symptoms, and put this scab in a healthy individual. The scab was typically dried out so that the infection was as mild as possible. The practice of inserting the mild infection varied. The method that grew to be common was making a slight cut on the arm and putting the infected material on it. The idea centers on the belief that if exposed to a small amount of the disease, the individual's body will be able to fight it off by creating antigens that react to the disease. Once these antigens are created, they will recognize when the disease appears again, and be ready to fight it off. And so variolation was believed to provide life-long protection against a disease.

1. Write a ten-line dialogue between an antigen and the infection.

2. If variolation, like vaccination, was believed to be a life-long cure for a disease, why is it recommended that we get flu shots every year?

The first documented account of variolation was in the 15th Century. The Chinese "injected" the infection in a completely unique way called "nasal insufflation" that was not carried out in other nations, but seemed to work for them. Smallpox was the most prevalent, deadly disease at the time. Scabs were taken from patients with *mild* smallpox cases, and were then dried for some time. The Chinese believed that by drying the scabs out, they were making the infection milder. A few scabs were then gathered and ground up into a fine powder. They then took a pipe, and packed the scab powder into it. The end of the pipe was placed in a person's nose, and the powder was blown into it! Disgusted yet? The tradition during this time was for the right nostril of a boy's nose to be used for variolation, and the left nostril for a girl. Once a person was variolated, they were treated as infectious and separated from the healthy population until their symptoms had cleared and they had successfully beaten the infection.



3. Why do you think different nostrils were used for boys and girls? (Even if you don't know the Ancient Chinese reason for this, just make one up!)
4. How willing do you think people were to try this procedure? Would you have?
5. What are (at least) three criteria you would want met before trying a new medicinal practice?

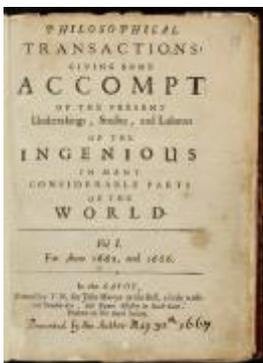
The Middle East and Africa are the next two places where variolation became prevalent. By the 18th and 19th century, Sudan had two immunization practices that were common among the population. One was called "Tishteree el Jidderi", which meant "buying the smallpox". This method was mostly seen among women with uninfected babies. A mother would bring her baby to a house where a newly infected baby lived. She would then take a cotton cloth and tie it around the infected baby's arm. When the cloth was believed to be mildly infected, the two mothers would barter over the price of the infected cloth. Once they had reached a deal, and the cloth had sat for some time on the baby's arm, the mother would pay the price and take the infected cloth and her healthy baby home. She would then take her own baby's arm and tie the cloth on it. In addition to the price for the infected cloth, the mother of the healthy baby would also often bring over gifts for the parents of the infected baby. Isn't it interesting how people desired the terrible infection?

6. If you lived in the 18th or 19th century in Sudan, what would you give as a gift to the parents of the infected baby and why?

An earlier method in Sudan was called "Dak el Jedri", meaning "hitting the smallpox". This method began by collecting fluid from a smallpox pustule (like a scab or blister). A cut would be made on a person's skin, and then fluid rubbed into it. This method spread throughout Africa, and it is believed that merchants brought the practice to Turkey and Greece. It later became a common practice in England in the 16th century.

7. What method would you rather use -- the Chinese pipe blowing, "buying the smallpox", or "hitting the smallpox" -- and why?

When variolation first spread through Western Europe, the common belief was that it was simply a myth, having no truth or scientific reason behind it. However, one Italian doctor, Dr. Emmanul Timoni, practiced the method in his home of Constantinople (now Istanbul) and wrote a medical record of his findings. The account was called *Philosophical Transactions*, which he published in 1714. It was the first detailed medical synopsis of variolation in Europe. This book caught the eyes of Lady Mary Wortley Montague, who was the wife of the British Ambassador to the Ottoman Empire, and Cotton Mather, who was a preacher in Boston.



Philosophical Transactions



Lady Mary Wortley Montague



Variolation in England



Cotton Mather

Lady Mary Montague had her share of experiences with smallpox. Her brother died of it, and though she survived, it left serious scarring on her face. She was visiting Turkey when she came across the practice of variolation. Wanting to protect her children and nation, she became increasingly curious about the method. She decided to have her five-year-old son,

Edward, variolated in 1718, and later she had her four-year-old daughter variolated. Both times, her children beat the disease and were advertised as success stories for variolation.

Later that year, an experiment was offered to six prisoners at the Newgate Prison of London. The deal was for them to be variolated, and if they survived, they would be freed. The experiment was wildly successful and variolation was promoted throughout England. But in 1783, the eighth son of King George III died from smallpox after being variolated, causing some hesitation among the population.

8. Do you think parents should be allowed to decide if their children are vaccinated? Why or why not?

In the 18th century another surgeon, Robert Sutton, began experimenting with the variolation technique in England. When the procedure failed on his son in 1757, Robert set out to find a procedure where the infection would be as mild as possible; he believed this would prevent people from becoming overwhelmed with the infection and dying. He advertised "a New Method of Inoculating for Smallpox" in 1762, keeping the new method a secret that only his three sons knew. Sutton had treated over 300,000 people by 1770 with extreme success. Eventually, Sutton's eldest son Daniel published the secret in 1796 in a book called *The Inoculator*. The secret was to make a shallow cut in the skin and use only very mildly affected donors. At the time, bloodletting, to rid the body of infection, was common. But it was not used in Sutton's method.

9. Come up with names for the four methods of variolation discussed.

England was now a hotspot of variolation innovation. Catherine the Great of St. Petersburg even asked Thomas Dimsdale to come to Russia to variolate her, her son, and 140 members of the Court. Because the results were so successful, Dimsdale was made a Baron of the Russian empire and rewarded with a large sum of money. Catherine also had a plan if the variolations did not work; Dimsdale was to be secretly escorted out of the city.

10. Write a newspaper article that could have appeared after Catherine the Great and the others were successfully variolated.

11. Now write a "letter to the editor" as someone who protests the variolation.

In 1706, a Boston minister named Cotton Mather discovered the method of variolation through his North African slave, Onesimus. When Boston suffered a smallpox outbreak in 1721, Mather was ready to promote the variolation method. Zabdiel Boylston, who supported Mather's efforts, variolated 300 patients with only six dying. George Washington went on to have the entire Continental army variolated in 1775.

Variolation eventually developed into the present-day "vaccination" when doctors began experimenting with using the cowpox virus which was much less dangerous (as patients cannot get smallpox from the disease) but still effective in creating the antigens to fight off smallpox.

Just as there was opposition along with the development of each new technique of *variolation*, *vaccination* techniques have faced similar, negative receptions since they were created. When Edward Jenner began experimenting with the cowpox virus in the 1800s, he faced countless objections from people on the grounds that it was unsanitary, sacrilegious, crude, and had no scientific basis. Many parents were fearful of the vaccination process, which involved making shallow cuts on a child's arm in order to insert the infection. The vaccines were also refused because they were seen as "unchristian".

12. Why might vaccinations be seen as "unchristian"?



Edward Jenner



Edward Jenner & First Patient



Cowpox Virus

When laws were made in favor of vaccination during the 1800s, tensions grew to an all time high. The Vaccination Act of 1853 made vaccinations mandatory for infants under 3 months old. In 1867, this law was extended to include children up to fourteen years old. There were also penalties added for those who chose not to vaccinate.

13. Do you think we should allow laws mandating what treatment people must get if it's for the good of the public? Why or why not?

After the Vaccination Act of 1867, the Anti Vaccination League and the Anti-Compulsory Vaccination League sprung into existence. In response to this, there was a commission to study the effects of vaccines in 1896, and they ruled that though the vaccination did indeed protect against vaccinations, the penalties should probably be withdrawn. And so the Vaccination Act of 1898 got rid of the penalties and provided for the option of an exemption certificate.

In 1902, there was a smallpox outbreak in Cambridge, Massachusetts, and the Board of Health ordered that all citizens be vaccinated. When one civilian, Henning Jacobson, refused, he went to court over the matter and lost. He then appealed to the U.S. Supreme Court. The Court ended up ruling in favor of the state, saying that the state could enact compulsory laws to protect the public in the event of a communicable disease outbreak. This was the first Supreme Court case that dealt with giving states the power in matters of public health.

14. Name two other areas where you think the state should have power over the people.

There was also opposition to the DTP vaccine (Diphtheria, Tetanus, and Pertussis) across the globe in the 1970s. The Great Ormond Street Hospital for Sick Children in London stated that thirty-six children were affected by neurological problems after receiving the DTP vaccine. One physician named Gordon Stewart published reports linking neurological disorders to the DTP vaccine, which caused the National Childhood Encephalopathy Study to begin a huge investigation into the vaccine. They found that the risk of the DTP vaccine causing neurological problems was very small, and that the media was focusing on the risks instead of the benefits.

15. Do you think the media focuses too much on the negative side of issues? Why or why not?

Twenty-five years later, another anti-vaccination movement started in Britain with a doctor named Andrew Wakefield. He made a connection between the MMR vaccine (Measles, Mumps, Rubella) and bowel disease and autism, (a type of brain damage that affects social learning). However, it was discovered that he provided false data in the hopes of financially profiting from the investigations. There has been no link found between the MMR vaccine and autism as was originally stated in his "research".

The most recent movement in vaccines has been to "make them green" (without unnecessary chemicals). There has been controversy about an element called thimerosal used in vaccines, and its connection to autism. Though no evidence of this has been found, thimerosal is no longer used in most children's vaccines as a precaution.

MAIL

Just as vaccination has been in existence for hundreds of years with the practice and method changing through time, *mail* has also gone through many transformations since it came into practice. As mail has been used in different nations across time, its purpose has changed and its methods improved by various people. As you use mail for correspondence with College Guild, this will hopefully be an interesting topic!

The word *mail* came from the word *male* in Medieval English, which meant "a travelling bag or pack". The French also have a word like mail, *malle*, meaning "a trunk or large box". The Irish use the term *mála* to refer to "a bag". In the 17th century, *mail* was used to describe the bag that held letters, but soon *mail* came to mean "letters" and *mailbag* meant "the sack that contains the letters".

In Britain during the 19th century, *mail* described a letter going abroad and *post* referred to local deliveries. Today, the US delivers *mail* while the UK delivers *post*. It all means the same thing: letters going places!

16. Come up with an entirely new word for *mail*.

Researchers have determined that ever since there has been writing (as you learned about in Unit 3!), there has been a need to carry it to and from people. The first documented account of written works being transported comes from Egypt, in 2400 BC. Couriers, who were messengers that transported documents, were used by the Pharaohs of Egypt to spread their decrees to all the territories. The earliest piece of mail we have dates back to 255 BC from the Egyptians.

17. Imagine you are the writer of this first piece of mail. What did you say?

This system of carrying mail from place to place has been used for centuries. The first development of a postal service came in 550 BC in ancient Persia. There is documentation suggesting that King Cyrus the Great ordered that each province have a "postal system". He stated that he simply wanted all the citizens of the provinces to be able to send and receive mail. He also suggested that the countries nearby adapt this system so as to make communication easier. He even had roads built from western Iran to the city of Hakhia in the east. Messages would be carried by a *chaper*, who rode on horse to a post and then swapped his horse for a new one. This way, the horses would always be fresh and quick, and mail delivery would be efficient.



King Cryus the Great



Some researchers believe that the purpose of this postal system was not to give people easy access for sending and receiving mail, but rather a system for gathering "intelligence", or information on people. It became known as *angariae*, which in modern terms means "a tax system".

18. If you were King, what information would you want to gather on your people?

In India, the Mauryan Empire (322 - 185 BC) created a postal service during a time of financial and political stability. They also developed public wells, rest houses, and other useful services for the public.

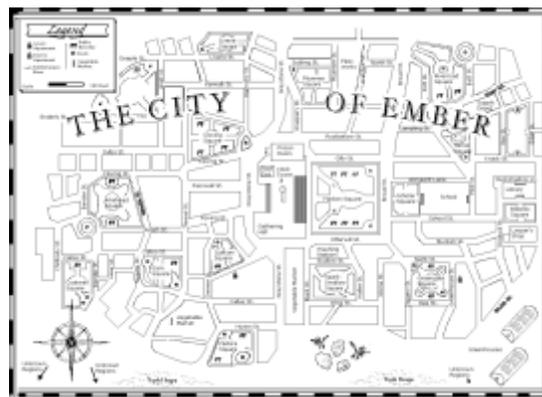
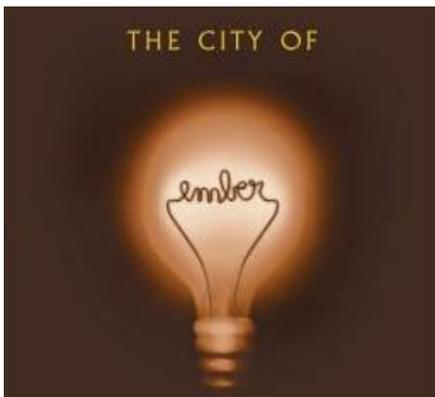
19. List three other public services/places that would be nice for the public to have.

Originally, only kings and other rulers used the service. The important documents and messages were brought to different locations with runners or with the use of chariots. This system became incredibly efficient, and in an account by Thomas Broughton, he acknowledged that "the Maharaja of Johpur sent daily offerings of fresh flowers from his capital to Nathadvara (a distance of 320 miles) and they arrived in time for the first religious Darshan at sunrise." One subject of controversy was that mail was available to special officials for free. Because of this, the Indian Post Office came into existence on October 1, 1837, and it helped regulate the post system.

20. Should some people be allowed to mail things for free? Explain why (and who) or why not.

We mentioned the use of "runners" above, which are clearly not in existence anymore. However, Jeanne DuPrau wrote a post-apocalyptic science fiction novel in 2003, called *The City of Ember*, where "runners" come back into play. The story takes place in an underground world created by "The Builders" -- scientists, doctors, and architects who made the city for inhabitants to live in until the world was safe again. They had a locked box that would open in 200 years and tell the citizens how to return to earth. The box was supposed to be passed down from mayor to mayor, but was lost along the way. The story is set 241 years in the future; the city has run out of many supplies and the generator that gives light and power is almost worn out.

In the city, the students are assigned jobs by picking them out of a hat. The protagonist, Lina Mayfleet, is assigned "Pipeworks Laborer" but manages to switch with her schoolmate Doon Harrow for "Messenger", a job she knows she'll be perfect for because she loves to run. As a messenger, Lina listens to a person's message, repeats it back to him/her until she has it memorized correctly, and then runs to deliver the message to the recipient. She loves running through town, discovering people's secrets as she relays their personal messages, and experiencing new places. She eventually manages to find the secret box and tries to figure out its mysteries.



There are some sources stating that the Chinese had the oldest postal system in the world, but the first *credible* system was found to be in the Han Dynasty (206 BC - 220 AD). The Tang Dynasty then went on to create 1,639 posthouses and employed over 20,000 people. The Ministry of War administered the system, and any sort of private correspondence was illegal.

21. How do you think we determine if a document or source is *credible* or not?

22. List two reasons the Dynasty may have made private correspondence illegal.

Rome also had a postal service that began during the reign of Augustus Caesar (62 BC - 14 AD). Called *curses publicus*, the service used carriages drawn by horses to quickly transport the mail. There was also a special government correspondence service that used a cart pulled by Oxen.

23. Should the government and public have two different mail systems? List two advantages for having one system and two for having two systems.

During the Middle Ages (5th to 15th century), in an effort to make the postal service even faster, *homing pigeons* were used to transport the mail. This type of bird has an especially keen sense of orientation, and when taken from their homes they can almost always find their way back. The pigeons were taken from their nests, had messages tied to their legs, and were then freed so they could bring the messages home. Other means of transporting the mail included: dogsleds, skis, mules, balloons, pneumatic (operated by air or gas under pressure) tubes, and even submarines!

24. Come up with another method that could be used to transport mail on Earth. Now think of another method to transport mail somewhere else (either in the universe or your own made up world).

In the United Kingdom, the postal system was seen as pricey, confusing, and corrupt until the 1840s. A man named Sir Rowland Hill reformed the postal system with such ideas as requiring pre-printed envelopes and postage stamps so the sender, instead of the receiver, had to pay for the letter.

In this day and age, postage stamps are sometimes collected for fun or to study. This is called *philately*, although the name formerly refers only to "the study of stamps".

25. Design your own postage stamp.

There are also people who collect postcards. A postcard is just a single sheet of paper, decorated with a photograph or drawing on one side, and a space for an address and message on the other side.



26. Write a postcard from any country or city of your choosing to someone who has never been there before. Draw the picture on the other side, too. (The information can be made up!)

Though the postal service is still used, the amount of mail sent by the U.S. Postal Service has decreased by 15% since 2006, when it was transporting 213 billion pieces of mail per year. What caused this decline? The Internet, of course! With

the Internet came an almost unbelievably quick method of mailing -- EMAIL. Email stands for electronic mail, and with this we can send messages, documents, pictures, and many other things instantaneously. People can communicate across countries and continents in seconds.

27. Name two advantages and two disadvantages that came with the transition from mail to email.

28. Write a fictional story about someone from an ancient civilization who discovers a technological object from the future. (This can be a real or made-up object.)

Since this is your final Unit, we'd appreciate any feedback or suggestions you have for improving the Course!

Remember: First names only & please let us know if your address changes

Appendix Histories: Unit 5 of 5

Citations

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