

HEALTH HEROES



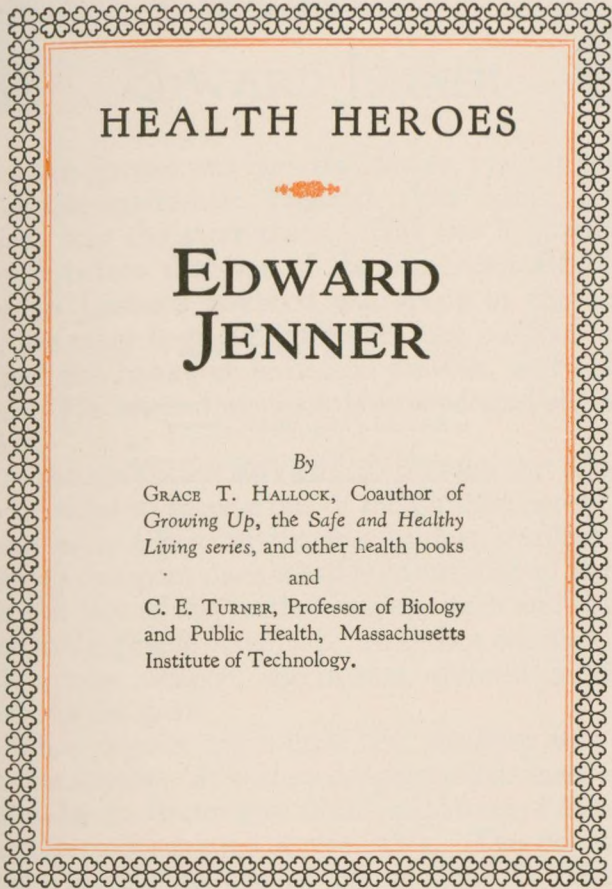
EDWARD JENNER

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EDWARD JENNER

By

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EDWARD JENNER

EDWARD JENNER was born on May 17, 1749, at Berkeley in Gloucestershire, England. His father, STEPHEN JENNER, was the vicar there. This was a quarter of a century before the war of the American Revolution. EDWARD JENNER's boyhood was spent in the country and, like other boys and girls who love outdoor life, he studied the habits of birds and animals, and collected fossils. His interest in natural history lasted all through his life.

Although JENNER was just an everyday sort of boy, he was destined to become one of the greatest heroes of the human race, a hero in the war against smallpox. For centuries this giant disease had been striding up and down over the face of the earth, bringing death and disfigurement to the people in its path. And then one man, armed with a new weapon, vaccination, showed us how to overcome the giant.

When JENNER was a little boy, smallpox was a very common disease. It was so dangerous that many people used to have a doctor give them a mild form of the disease as a protection against a severe attack. This practice was called "inoculation against the smallpox." The usual method of inoculation was to take matter from the sores or pocks of a patient with a mild case of smallpox and place it in three or four scratches on the body of the person to be inoculated. This ordinarily gave a mild form of smallpox to the person treated. Before inoculation the patient usually had to go through a preparatory process.

JENNER'S Inoculation

When EDWARD JENNER was a fine, ruddy-cheeked boy of 8, his family decided to have him inoculated. With many others he was put through the preparatory process. This trying procedure lasted six weeks. He was first bled to find out whether his blood was "fine." Then he was purged until his rosy cheeks became pale and thin. During all this time he was kept on a scanty diet and dosed with some drink which was supposed to sweeten his blood. At the end of this time he was inoculated with smallpox. By good luck his attack of the disease was mild, but it is often said that he could never sleep as well afterward and he sometimes imagined that he heard strange noises. This experience of little EDWARD JENNER is especially interesting, because it was he who was to put an end to the practice of inoculation by the development of the simple and harmless procedure of vaccination. In order to understand what a great service JENNER rendered to humanity, it is necessary to know something of the history of smallpox up to his time.

The History of Smallpox

Today we can scarcely imagine what smallpox meant to people in the days before vaccination. Figures may help us a little. About 150 years ago, 10 out of every 100 deaths were caused by smallpox. Out of every 100 children who died before they were 10 years old 33 died of smallpox. More than half of all the people living were scarred and disfigured by it. It is estimated that 60,000,000 of the inhabitants of Europe died from smallpox in the 18th century. It attacked persons of every rank, from the peasant to the king.



Smallpox is no respecter of persons

So common was smallpox before 1796 that an adult person who had not had smallpox was scarcely met or heard of in the United Kingdom. "If a fugitive from justice had happened never to have had an attack of smallpox, and, therefore, was not pock-marked, this fact was mentioned as a means of identification. Imagine the laughter that such a means of identification would excite today. Today, on the contrary, if he happened to be pock-marked, that fact would be advertised as a means of identification."*

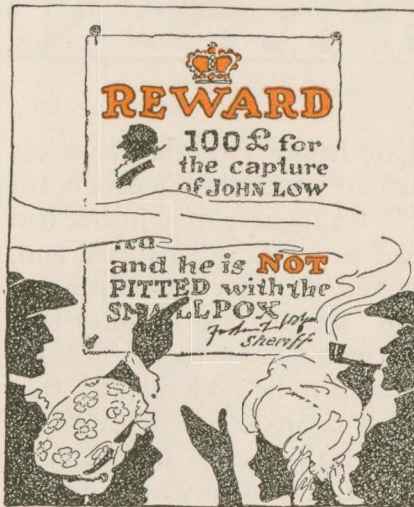
According to tradition, smallpox had its origin in India. It was also known in China at a very early period. The disease traveled west through Arabia, Ethiopia, and neighboring countries, and was brought to Alexandria in Egypt by the Arabs in A. D. 640. The first epidemic of smallpox in Europe took place about the latter part of the 16th century.

Smallpox is very contagious, and a severe attack means either death or disfigurement. A person who has had it usually cannot take it again. Is it any wonder that many people preferred to have a doctor deliberately give them a mild form of the disease as a protection against a severe attack?

*W. W. KEEN, M.D., *Personal Experience in Three Epidemics of Smallpox.* Saturday Evening Post, February 28, 1925.

The History of Inoculation

Inoculation is said to have been practiced first in India over 1,000 years before Christ, and we know that it was an old custom in China. From Asia and Africa the



An advertisement for a fugitive from justice who was not pock-marked, in the days before vaccination

practice of smallpox inoculation passed into Europe by way of Constantinople where it was known in the latter part of the 17th century. Among the Arabs the custom was called "buying the smallpox." Dr. PATRICK RUSSELL, a physician at Aleppo, wrote a letter to his brother in 1726 in which he explained why this expression was used.

This method of procuring the disease is termed the buying of smallpox on the following account. The child to be inoculated carries

a few raisins, dates, sugar-plums or suchlike, and showing them to the child from whom the matter is to be taken, asks how many pocks he will give in exchange. The bargain being made, they proceed to the operation. When the parties are too young to speak for themselves the bargain is made by the mothers.

Inoculation was introduced into England by Lady MARY WORTLEY MONTAGU. Lady MONTAGU was the wife of the British Ambassador at the Ottoman (Turkish) Court. She saw inoculation practiced in Turkey

and was very enthusiastic about the results. In 1717 she wrote to a friend:

I am going to tell you a thing that I imagine will make you wish yourself here. The smallpox, so fatal and general amongst us, is here entirely harmless by the invention of engrafting, which is the term they give it. There is a set of old women who make it their business to perform the operation every autumn in the month of September, when the great heat has abated. People send to one another to know if any of their families has a mind to have the smallpox. They make parties for this purpose, and when they are met (commonly 15 or 16 together), the old woman comes with a nutshell full of the matter of the best sort of smallpox, and asks what veins you please to have opened. She immediately rips open that which you offer to her with a large needle (which gives you no more pain than a common scratch), and puts into the vein as much venom as can lie upon the end of her needle, and after binds up the little wound with a hollow bit of shell; and in this manner opens four or five veins. The children or young patients play together all the rest of the day and are in perfect health until the eighth day, then fever seizes them and they keep their beds two days, very seldom three. They have rarely about 20 or 30 (pocks) on their faces, which never mark, and in eight days' time they are as well as before their illness. Everywhere thousands undergo this operation, and the French Ambassador says pleasantly that they take the smallpox here by way of a diversion, as they take the waters in other countries. There is no example of anyone that had died in it, and you may well believe I am satisfied of the safety of the experiment, since I intend to try it upon my dear little son. I am patriot enough to take pains to bring this useful invention into fashion in England.

Inoculation in England

Lady MONTAGU had her little son inoculated in March 1717. This was the first time that the Eastern method of inoculation was performed on a British subject. When Lady MONTAGU returned to England she continued her crusade for inoculation. Most people, however, were afraid to try it until they had seen its results.

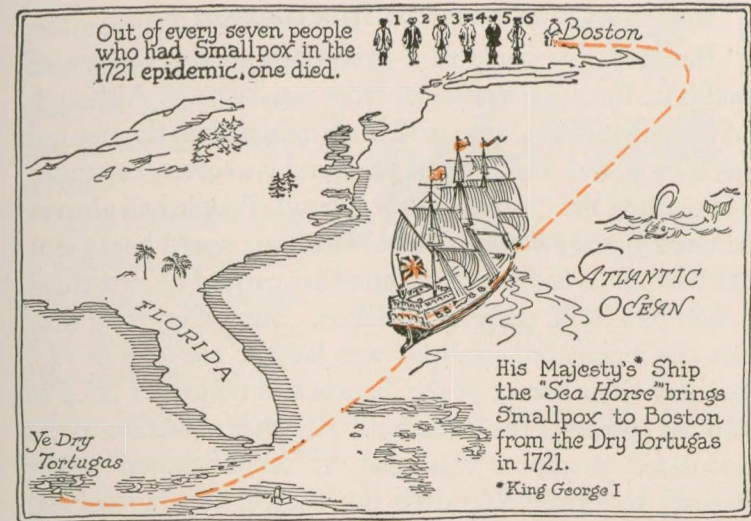
In August 1722 six criminals in Newgate Prison were offered their freedom if they would submit to the operation of inoculation. They agreed, the inoculation was successful, and the criminals were set free. CAROLINE, Princess of Wales, ordered the operation to be performed on some charity children, and as the results satisfied her, she had two of the young princesses inoculated. With this royal approval the practice gained steadily in England, and many English physicians became skillful inoculators.

Inoculation in America

The inoculation of smallpox was introduced into America during the smallpox epidemic in Boston in 1721. This was Boston's sixth epidemic. The city then had a population of 11,000. There were 5,989 smallpox victims during the epidemic and 894 died, a proportion of about one in seven. COTTON MATHER became interested in inoculation through reading accounts of it as practiced in Turkey and neighboring countries. He wrote a letter to the physicians of Boston on June 6, 1721, urging them to call a meeting for the consideration of inoculation. He said in his letter:

I will only say that inasmuch as the practice of suffering and preventing the *Small-pox* in the way of inoculation has never yet (as far as I have heard) been introduced into our Nation; where there are so many that would give *great sums* to have their lives insured from the *dangers* of this dreadful *Distemper*, nor has ever anyone in all *America* ever yet made the trial of it (tho' we have several *Africans* among us, as I now find, who have tried it in their own *Country*) I cannot but move that it be *warily* proceeded in.

Dr. ZABDIAL BOYLSTON was the only physician who listened to COTTON MATHER. On June 26, 1721, he inoculated his son THOMAS, six years of age, and two of his negro slaves. Dr. BOYLSTON and COTTON MATHER



both became very unpopular because of their championship of inoculation. Against Dr. BOYLSTON people were so enraged that his family was hardly safe in his house and he often met with insults in the streets. Many people were struck with horror and thought that if any of his patients should die, he ought to be treated as a murderer. An entry in COTTON MATHER's diary on July 16th tells of the behavior of the people:

At this time I enjoy an *unspeakable consolation*. I have instructed one physician in the new method used by the *Africans* and *Asiatics* to prevent and abate the Dangers of Small-pox, and infallibly to save the lives of those that have it wisely managed upon them. The Destroyer, being enraged at the proposal of anything that may rescue the lives of our poor people from him, has taken a strange possession of the people on this occasion. They rave, they blaspheme, they talk not only like idiots but also like *Franticks*, and not only the physician who began the experiment but I also am an object of their Fury; their furious *Obloquies* and *Invectives*.

Objections to Inoculation

But now we come to a new stage in the history of smallpox. Inoculation was far from satisfactory. Although the inoculated smallpox was much milder than the natural smallpox it was just as contagious and was often the cause of spreading the disease widely around. People had always shunned houses where natural smallpox raged because it was natural to flee from a plague that carried off one third or one fourth of those it attacked. But when they saw that the inoculated smallpox was fatal to *one only in 150*, they lost their horror of the disease and no longer tried to stop the spread of the infection. Another objection to the inoculated smallpox was that it often caused other diseases to break out after the attack, just as natural



Riots in Boston, directed against the champions of smallpox inoculation

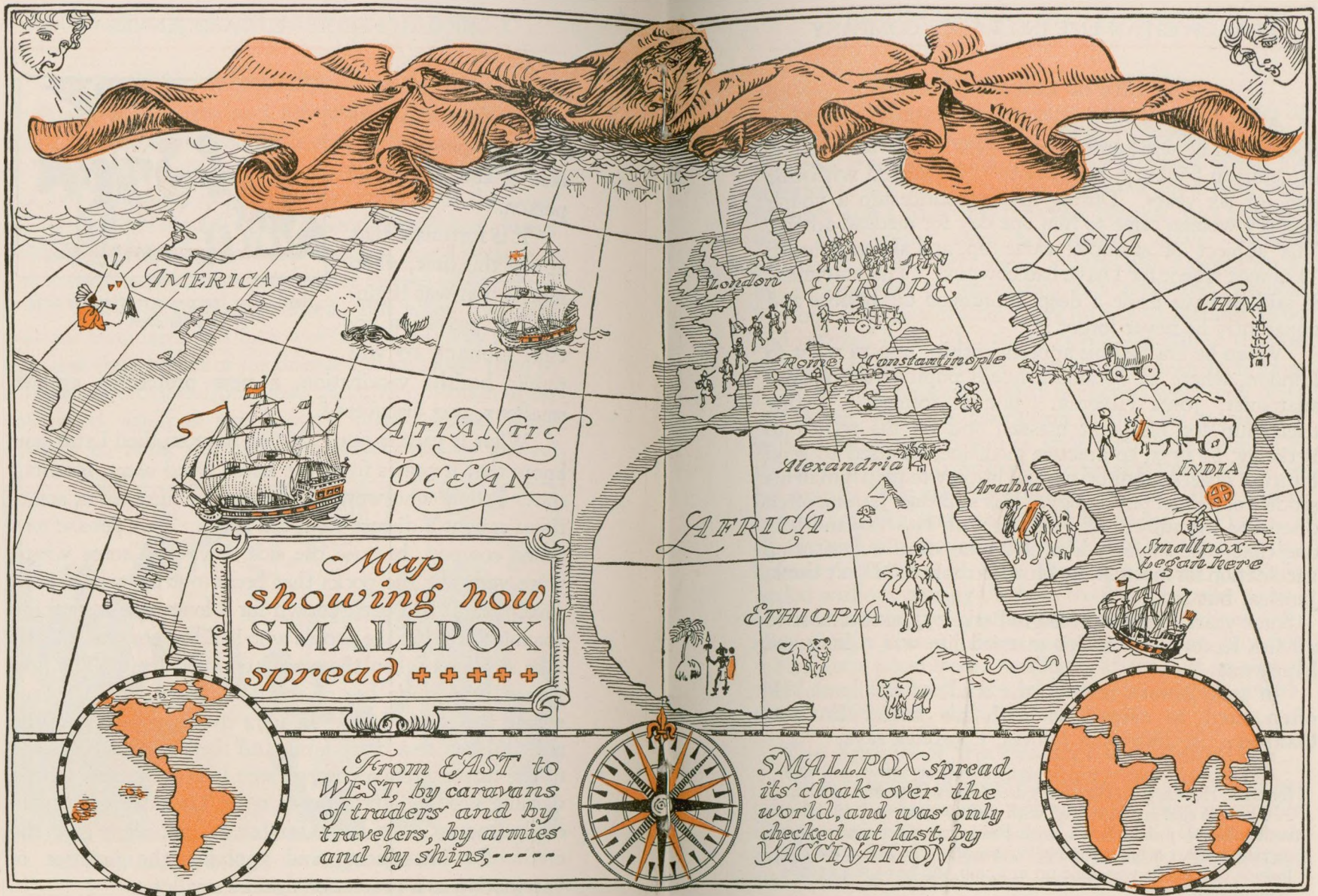
smallpox did. Moreover, it frequently left scars or pits on the face of the inoculated person.

It is fortunate that at just this time, when inoculation was beginning to prove an actual menace to the public health, vaccination, a new protection against smallpox, was discovered.



BENJAMIN JESTY vaccinating his wife and children

What is vaccination? If you have studied Latin you know that it comes from the Latin word *vacca*, meaning *cow*. People who worked in dairies milking cows, sometimes caught a disease from the cows. This disease was called cowpox, because the sick cows had sores which were very like the pocks that broke out on people with smallpox. It had been known for a long time in farming communities that the people who had had cowpox did not take smallpox when they were exposed to it. The first person who made use of this knowledge was a farmer named BENJAMIN JESTY. In 1774 this man took his wife and children to a dairy farm, and there introduced some of the matter from a cowpox sore into their arms with a darning needle. JESTY never made his experiment generally known. To EDWARD JENNER we must give the credit for introducing and applying the practice of vaccination as a protection against smallpox.



The Life of EDWARD JENNER

At the age of 13 EDWARD JENNER decided to be a doctor and he was apprenticed by his family to a firm of surgeons in Sodbury, near Bristol. He stayed with this firm for six years. During his apprenticeship a young country woman came to him one day for medical advice. The subject of smallpox came up, and she exclaimed: "I cannot take it for I have had cowpox." This statement is said to have made a deep impression on JENNER and apparently he never forgot it.

When he finished his apprenticeship, JENNER went to London, where he became a house pupil of the famous anatomist, JOHN HUNTER. JENNER formed a lasting friendship for his great master, and on his return to Berkeley, in 1773, to practice medicine, he used to send HUNTER observations on natural history to help him in his studies of animal physiology. It is said that JENNER often discussed the subject of smallpox with HUNTER and that one time when telling him of his hopes of substituting vaccination for inoculation, HUNTER replied: "Don't think, JENNER, but try."

Some years after his return to Berkeley, JENNER married a Miss KINGSCOTE and his married life was a long and happy one.

In 1780 JENNER took up the study of smallpox. He often used to discuss it with his friend EDWARD GARDNER. In describing JENNER, GARDNER says:

He was rather under middle-size, but robust, active, and well formed. He was particular in his dress, and when I first met him . . . he was clad in a blue coat with yellow buttons, buckskins, well-polished jockey boots with handsome silver spurs, and carried a smart whip with a silver handle. His hair after the fashion of the time was done up in a club, and he wore a broad-brimmed hat.

The History of Vaccination

JENNER collected a great many descriptions of cases of people who had had cowpox and had afterward resisted smallpox contagion. He finally had a chance to put his theories to the test. Cowpox broke out on a farm near Berkeley and a dairy maid, SARAH NEMES, was infected with the cowpox from her master's cows. JENNER selected a healthy boy about 8 years old, JAMES PHIPPS, for the purpose of inoculating him with the cowpox. He took some matter from a sore on SARAH NEMES' hand and inserted it, on May 14, 1796, into the arm of the boy by means of two scratches, each about half an inch long.

If you can remember what happened when you were vaccinated, JENNER's description of the first vaccination will probably remind you of your own experience. On the seventh day JAMES PHIPPS complained of soreness in his armpits. On the ninth day he became a little chilly, lost his appetite, and had a slight headache. He felt sick all day and was restless that night, but on the next day he was perfectly well. The sores on his arms gradually healed without causing the least trouble. In order to find out whether the boy was protected against smallpox after such a slight illness, JENNER inoculated him on July first with matter taken from a smallpox patient, but no sign of the disease followed. He was again inoculated, several months afterward, with the same result.

The Spread of the Practice of Vaccination

Today vaccine is never taken from the arm of another person. It is taken from a calf which has been vaccinated along a clean, shaved surface of its body. Great care is exercised to be sure that the calf is healthy. The quality and purity of the vaccine is assured.

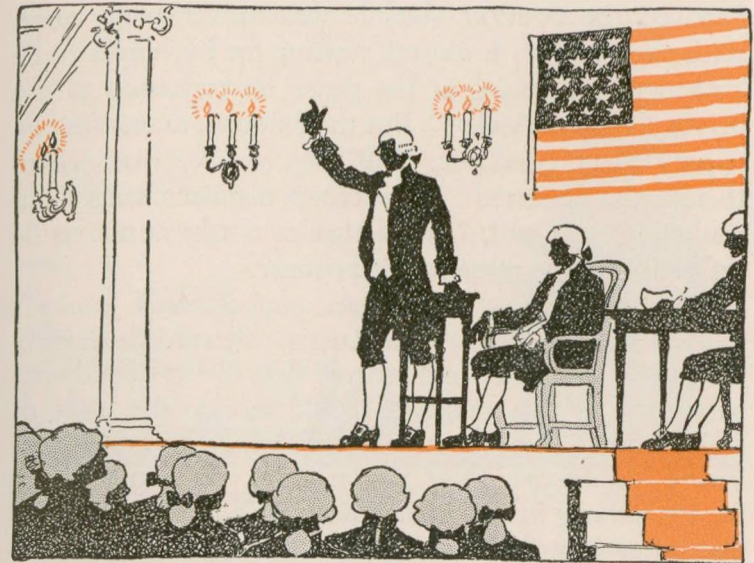
After making his first experiments JENNER published, in June 1798, his famous pamphlet entitled *An Inquiry into the Cause and Effects of the Variolae Vaccine or Cowpox*. This pamphlet caused a great deal of discussion and most people treated JENNER's discovery with scorn. However, some physicians gave it a trial. Mr. CLINE, of London, vaccinated a child successfully in July 1798, and on August 2d he wrote:

I think the substitution of cowpox poison for smallpox promises to be one of the greatest improvements that has ever been made in medicine. The more I think on this subject the more I am impressed with its importance.

JENNER was, however, opposed by many influential physicians. In 1799 he went to London and gathered around him a small band of enthusiastic supporters. He was encouraged by gaining the interest of the King, the Queen, and the Prince of Wales. Royal approval aided in the spread of vaccination throughout England.

Vaccination in America

Vaccination was first made known in America by Dr. WATERHOUSE, of Cambridge, Mass. At a meeting of the American Academy of Arts and Sciences presided over by JOHN ADAMS, President of the United States, the subject was considered and no time was lost in procuring a supply of vaccine matter. It was received in June 1800, and on July 8th Dr. WATERHOUSE vaccinated one of his sons, 5 years old, the first person to be vaccinated in America. He afterward vaccinated other members of his family. The children resisted smallpox infection and WATERHOUSE exclaimed: "One fact in such cases is worth a thousand arguments." Later THOMAS JEFFERSON



The subject of vaccination discussed before a meeting of the American Academy of Arts and Sciences

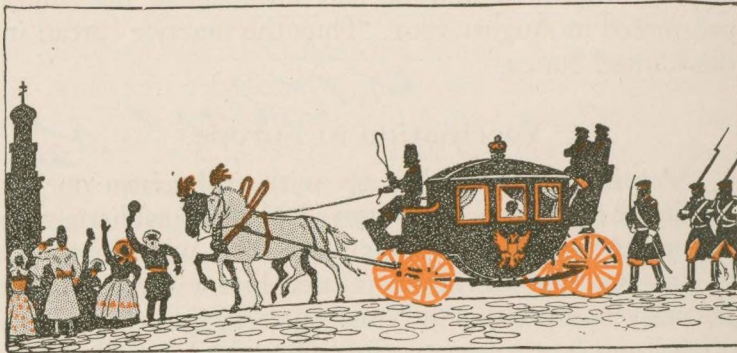
became interested and he had members of his family vaccinated in August 1801. Thus the practice spread in the United States.

Vaccination in Europe

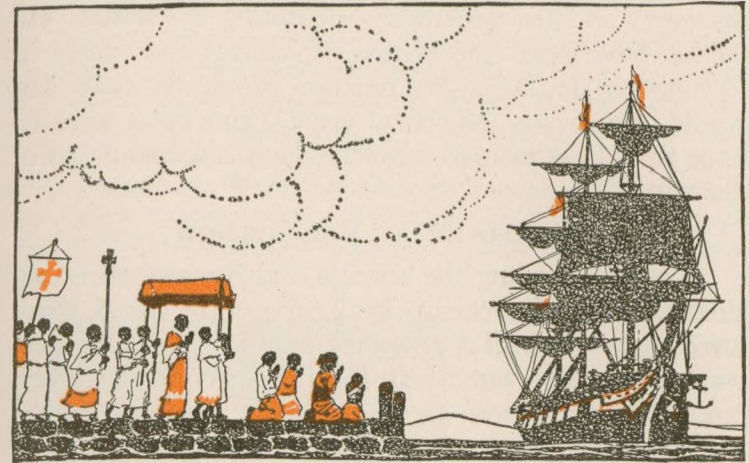
Vaccination was taken up with enthusiasm on the continent of Europe. NAPOLEON had all his soldiers, who had never had smallpox, vaccinated. He was so grateful to JENNER that he never refused him a favor. Once JENNER sent a petition to NAPOLEON asking for the release of an English prisoner at a time when the Little Corporal was feeling very bitter against England. NAPOLEON

received the petition when he was seated in his coach with the Empress JOSEPHINE waiting for his horses to be exchanged. Glancing at the paper he exclaimed to the driver: "Away! Away!" But the Empress, examining the paper closely, cried out: "But stay, you see from whom this comes—JENNER!" NAPOLEON's manner changed immediately. He said, "What that man asks is not to be refused," and he released the prisoner.

Among the most enthusiastic supporters of JENNER's vaccine was the Empress of Russia. She urged her subjects to be vaccinated and ordered that the first child who submitted to the operation should receive the name of VACCINOFF, and be educated at the public expense. The young VACCINOFF, after vaccination, was conveyed to St. Petersburg in one of her Majesty's imperial coaches and, after being educated at the public expense in the Foundling Hospital, received a pension for life. The Empress in commemoration afterward presented JENNER with a diamond ring.



VACCINOFF rides to St. Petersburg in an imperial coach



Religious processions receive the "blessed vaccine" in Sicily

The government of Spain dispatched an expedition in 1803 for the purpose of introducing vaccination throughout Spanish possessions in the old and new world. The vessel in which the expedition sailed carried 22 unvaccinated children who were to be vaccinated on the voyage in order to preserve the vaccine by passing it from arm to arm.

In Sicily and Naples, where smallpox was raging, vaccination was received with great enthusiasm. Religious processions were formed for receiving the "blessed vaccine." The practice of vaccination was introduced into Italy by Dr. SACCO, who wrote to JENNER in January 1808: "During eight years I reckon more than 600,000 vaccinated by my own hand."

In June 1802 JENNER was given a grant of £10,000 by Parliament as a reward for his labors in perfecting his

discovery and his generosity in making it public. He might have kept vaccination a secret and made a fortune by practicing it, because people in that day would, as COTTON MATHER wrote, "give great sums to have their lives insured from the danger of this dreadful distemper."

Opposition to Vaccination

Notwithstanding the success and support that vaccination was now receiving in all parts of the world, there were many who still opposed the practice, and pamphlets were constantly published by the antivaccinationists. Some people went so far as to assert that vaccination would cause a person to grow horns like a cow.

In spite of this unreasonable opposition, vaccination made steady progress. JENNER had many warm friends, and they rallied to his support with unanswerable arguments in favor of the practice. It was shown "that vaccination is not infectious and, in the opinion of the most experienced practitioners, has never proved fatal, that it causes no other disease, and that it leaves behind it one of the greatest blessings ever bestowed on man, that of a perfect protection against smallpox."

Honors Heaped on JENNER

In 1812, at Berlin, the discovery of vaccination was celebrated by a JENNERIAN feast. Diplomas poured in upon the discoverer from all parts of the world. One was received from the Red Indians of North America, which read:

Brother! Our Father has delivered to us the book you sent to instruct us how to use the discovery which the Great Spirit

made to you whereby the smallpox, the fatal enemy of our tribe, may be driven from the earth. We have deposited your book in the hands of a man of skill whom our Great Father employs to attend us when sick or wounded. We shall not fail to teach our children to speak the name of JENNER and to thank the Great Spirit for bestowing upon him so much wisdom and so much benevolence. We send with this a belt and string of wampum in token of our acceptance of your precious gift, and we beseech the Great Spirit to take care of you in this world, and in the land of spirits.



The Indians of North America send gifts to JENNER

In June 1806 JENNER was given a grant of £20,000 by Parliament. A national vaccination establishment was instituted for the purpose of developing a supply of pure vaccine. In 1811 JENNER visited London for the last time. Here he was presented to the Allied Sovereigns of Europe who were in London for a conference. Emperor ALEXANDER of Russia told him of the astonishing effect of

vaccination in Russia, where it had nearly subdued smallpox throughout that great country.

JENNER died on January 26, 1823. He lived long enough to see the complete triumph of his great discovery, and to know that it affords protection against one of the

most dreadful scourges of mankind. The following epitaph is inscribed on his tomb:

Within this tomb hath found a resting place
The great Physician of the human race,
Immortal JENNER! Whose gigantic mind
Brought life and health to more than half mankind.
Let rescued infancy his worth proclaim,
And lisp out blessings on his honored name;
And radiant Beauty drop one grateful tear,
For Beauty's truest friend lies buried here.

The Principle of Vaccination

Cowpox is a greatly modified form of smallpox. Smallpox germs do not find such favorable living conditions in the cow as they do in human beings. Their struggle for existence in the cow weakens them, just as a man might become weakened by having to work very hard for his living, and yet not make enough to buy the necessary food to keep his body well and strong. By overcoming the weakened germs that are drawn from a cow sick with cowpox, the body is enabled to protect itself against virulent smallpox germs.

Suppose a country is attacked by one tribe of a great race. This tribe is not strong enough to overthrow the country, but in fighting it the country develops its defenses. Then, when the main forces of the enemy enter the country, they find it prepared and they are unable to conquer it. In much the same way the body prepares itself, by fighting the weakened smallpox germs, to repel an invasion of the deadly germs of the same disease.

Modern Epidemics of Smallpox

We cannot say that mankind has won a complete victory over smallpox until it has been completely wiped out. One case in a community is enough to start a great

epidemic. Dr. WILLIAM OSLER tells the story of how one case did infect a whole city not so many years ago. In 1885 a sick Pullman porter was taken to a hospital in Montreal. At first the doctors didn't recognize his sickness as smallpox. There was a great unvaccinated population in Montreal because of people's indifference to vaccination. As a result of this one case, 3,164 people in a city of only 185,000 inhabitants died of smallpox. This meant probably that there were over 20,000 cases, as the proportion of deaths to cases is about one in seven.

Another great epidemic happened more recently. When the United States took over the Philippines, about 40,000 deaths occurred there every year from smallpox. Then Dr. VICTOR G. HEISER was made Director of Health for all the Islands and he started vaccination everywhere. In the provinces surrounding Manila there usually had been 6,000 deaths from smallpox every year. After HEISER's vaccinations were completed the death rate was reduced to zero. For the seven years before 1914 not a death from smallpox occurred in the city of Manila.

After 1914 vaccination was not effectively carried out and there grew up a huge unvaccinated population. Then came the epidemic of 1918, when there were 50,000 deaths from smallpox. This meant about 350,000 cases. In 1918-1919 among 5,422 vaccinated troops in the Philippines, though surrounded by smallpox, only one soldier contracted the disease. Then real vaccination was re-established, and smallpox vanished as promptly as before.

There was less smallpox in the United States and Canada in 1934 than ever before. In 1935 and 1936, however, the number of smallpox cases in the United States and Canada jumped to approximately 8,000 cases annually. In 1937, there was a greater increase, as 11,867 cases were reported. Throughout 1938, the disease continued to

spread and even reached epidemic proportions in some sections of the country where many people disregard the danger of catching smallpox and ignore or belittle vaccination as a protection against it.

Vaccination is the *only* way that we can prevent epidemics of smallpox from spreading through our communities. The best time for the first vaccination is in babyhood between the ages of 6 months and 1 year. Revaccination should be performed about the sixth year of a child's life. After this it is, as a rule, unnecessary to vaccinate again unless a person has been exposed to smallpox.

Vaccination is such a simple, harmless means of protection that an outbreak of smallpox is a disgrace to any civilized nation. How many boys and girls in your school wear the little white mark that means personal protection against one of the oldest enemies of the human race? May we not fail to use the life-saving knowledge which JENNER gave us!

REFERENCES

This story, EDWARD JENNER and Vaccination, is based on the following books and articles:

The History of Inoculation and Vaccination, Lecture Memoranda, American Medical Association meeting, Minneapolis, 1913, Burroughs Wellcome and Co., London.

The Three Original Publications on Vaccination Against Smallpox, by EDWARD JENNER, M.D., in the Harvard Classics, Volume 2. P. F. Collier and Son, New York, 1910.

Edward Jenner, in *Eminent Doctors: Their Lives and Their Work*, by G. T. BETTANY, JOHN HOGG, 1885.



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