

# Science Sleuths - A SCI-FI Science Adventure

Lost In London!

Episode 3

*The flash of light fades away and you find yourself in a doctors office. "Dr. John Snow, Physician and Surgeon" the door reads. Right below is a sticky note, a message from Professor Evan!*

*"Welcome to 19th century London! I need to jump to the next period in time, but I need you to help my good friend Dr. Snow. He's working on trying to find where the cholera bacteria making people sick are coming from. Inside his office you'll find all of the clues we' have found. Tracking a disease is a lot like solving a crime. Can you figure out the source of the disease using Dr. Snow's research?"*

## **Instructions:**

- Use the clue cards, town map, and case studies to piece together where the bacteria are coming from.
- Circle areas on the map where the outbreak is occurring to help narrow down the source.
- When you discover the source mark it with a large X.

**The source of the outbreak is the \_\_\_\_\_.**

*Congratulations! You have solved the mystery and found where the disease is coming from! Now the people of London will have access to safe and clean drinking water. As you and Dr. Snow celebrate, with one of the famous kidney pies from Butchers Lane he exclaims "Oh silly me, I forgot! Professor Evan left this for you!" You open the envelope and find another set of time coordinantes and a strange metal disk. Maybe this is one of the keys to Atlantis you've been searching for!*

*As you enter the new coordinates into the time machine a flash of light appears to carry you off on your next adventure.*

*To be continued next week...*

## Additional Learning:

Cholera is a disease caused by the *Vibrio cholerae* bacterium. The bacterium travels through untreated water contaminated by human or animal feces (poop). Cholera is spread by sharing contaminated water or by eating contaminated food. Since the body does not produce a lasting immunity against the bacterium, the disease can be contracted more than once. People who contract the illness are known to become very dehydrated since water leaves the body quickly for those who are ill.

In 1854, hundreds of people living in London became sick during a cholera epidemic. The disease spread from India to London on ships that carried contaminated drinking water. If a ship was known to carry the disease, the London port authorities refused to grant docking privileges. Rather than lose money on their cargo, some ship captains deceived the authorities by dumping contaminated water overboard into the Thames River, London's water source.

London was served by competing water companies in 1854. At least one, in an effort to cut costs, failed to adequately filter the river water being pumped into the city. While upper- and most middle-class citizens had indoor plumbing, the poor of London relied on public pumps for their water needs. Dr. John Snow, considered the father of epidemiology, is credited with tracking and identifying the source and transmission agent of the 1854 cholera epidemic.

Even though many people doubted and disapproved of Snow's contaminated water theory, Dr. Snow persuaded the authorities to remove the source of the contamination. This simple act saved the lives of many people and marked the beginning of the end of a tragic situation.

Modern medicine has produced a vaccine against cholera, but it must be repeated every six to twelve months because the antibodies are short lived. Too often though, citizens in impoverished nations do not have the funds to get the vaccine. Used for centuries in India, the most effective treatment is to provide the victim with large amounts of liquids and rehydration salts.

\*adapted from "Poison Pump" Project Wet Foundation, 2011.

**Answer Key: the bacteria was coming from the water pump, contaminated by the nearby shops and sewage.**

# Clue Cards (K-4)

**#1**

The people living around Broad Street all get their water from outdoor pumps.

**#4**

Matilda Wright only drinks water from the Broad Street pump.

**#2**

Thomas Sutterfield fell ill after visiting his great-aunt, Matilda Wright. He drank a glass of water at her house.

**#5**

Ausley and Marthy Brown are the only people on Ely Street who did not get sick. The Browns get their water from the Soho pump.

**#3**

Shortly after cutting his lip, Tolly Martin washed his mouth off at the Broad Street pump.

## Case Study Cards Grades K-4:

Use the info below with the map to find common places where people have visited or gone to and see which places most people who are sick have been!

<p>Thomas Sutterfield, Lawyer:</p> <ul style="list-style-type: none"> <li>• Lives in <b>Hyde Park</b> with wife and two children</li> <li>• Worked for a butcher who has a shop on <b>Broad Street</b>.</li> </ul>	<p>Slye Children, ages 7, 8 and 10:</p> <ul style="list-style-type: none"> <li>• Father is a <b>Broad Street</b> Butcher.</li> <li>• Slye family recently moved to <b>Kings Cross</b> from <b>Broad Street</b> and now have indoor plumbing.</li> <li>• When not in school, the Slye children went with their father to work and played on <b>Broad Street Square</b>.</li> </ul>
<p>Matilda Wright, Wealthy, 90-year-old:</p> <ul style="list-style-type: none"> <li>• Lived alone (with her three servants) in the family mansion on <b>Marston Court</b>.</li> <li>• Great-aunt of <b>Thomas Sutterfield</b>.</li> <li>• Known by family members as “Tilda”</li> </ul>	<p>Mucky Johnson, 18, delivery boy from Coventry Circle:</p> <ul style="list-style-type: none"> <li>• Delivered food from <b>Coventry Market</b> to homes on <b>Marston Court Road</b>.</li> <li>• Often stopped to eat lunch and talk to people on <b>Broad Street Square</b>; said the water from the <b>Broad Street pump</b> was the best in the city.</li> </ul>
<p>Tolly Martin, 10 years old:</p> <ul style="list-style-type: none"> <li>• Occasionally walked far from <b>Soho</b>.</li> <li>• Sick for two days after getting a cut in <b>Broad Street Square</b>.</li> </ul>	<p>John and Mary Canty .</p> <ul style="list-style-type: none"> <li>• From <b>Soho</b></li> <li>• Often stopped to visit John's mother who lived on <b>Butcher Lane</b>.</li> </ul>
<p>Owen and Obedience Turner, and three children</p> <ul style="list-style-type: none"> <li>• Lived on <b>Paddy Lane</b> behind butcher shop on <b>Broad Street</b>.</li> <li>• Owen Turner earned money cleaning up the messes at the butcher shop.</li> </ul>	

# Clue Cards (5-8)

**#1**

The people living around Broad Street are poor. Large families are crowded into small homes. No one has indoor plumbing; residents use outdoor toilets and get their water from outdoor pumps.

**#4**

Matilda Wright refused to drink water from her home. She would only drink the water that her workers got from the Broad Street pump.

**#2**

Thomas Sutterfield fell ill two hours after stopping off to visit his great-aunt, Matilda Wright. He had tea, biscuits, and sausages with his great-aunt. It was a hot day and he took a drink of cold water before leaving.

**#5**

Ausley and Marthy Brown and their two children are the only people on Ely Street who did not get sick. Marthy's family lives in Soho. The Browns get their water from the Soho pump, which allows them to visit their other family

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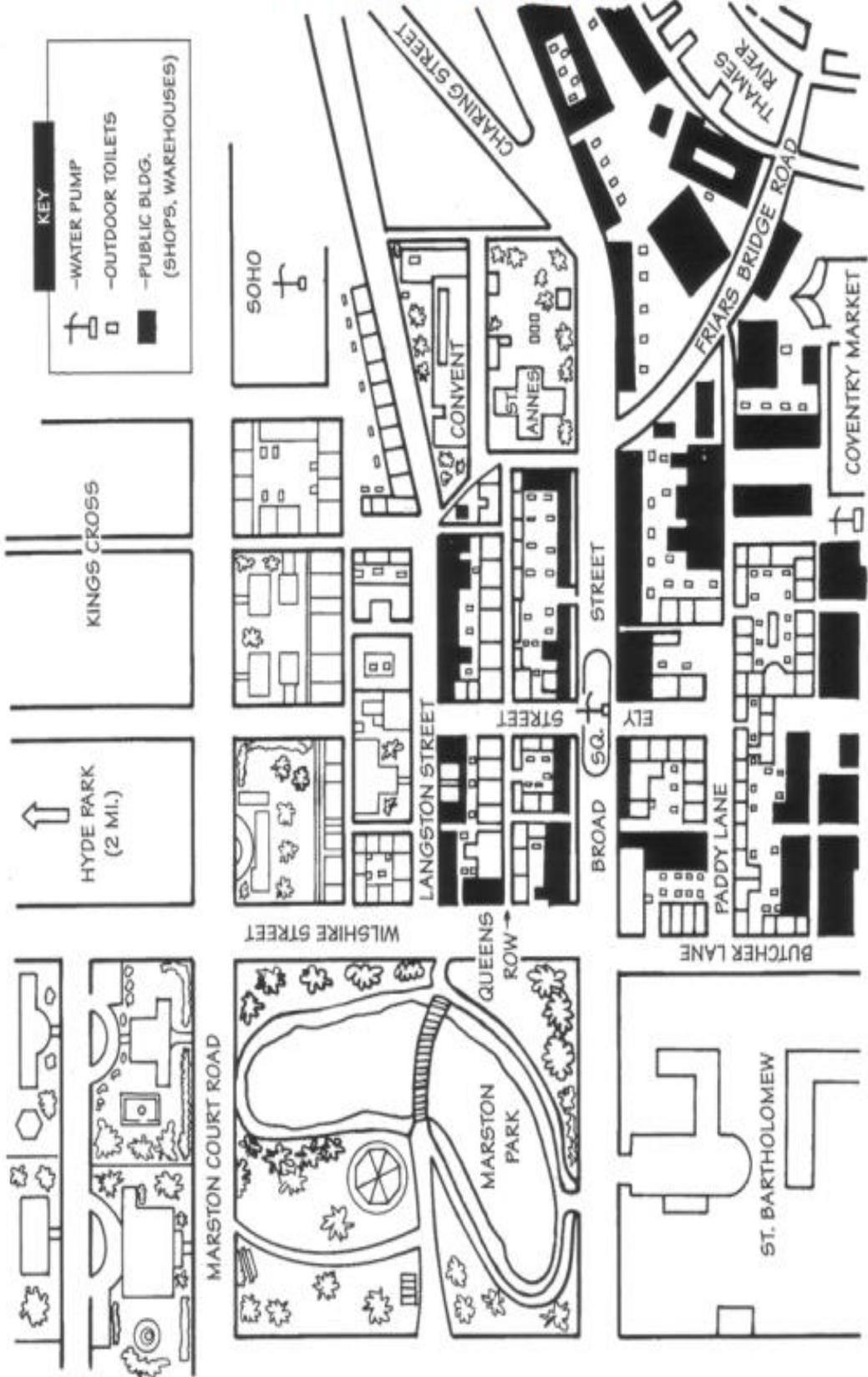
### **#3**

Shortly after cutting his lip, Tolly Martin washed his mouth off at the Broad Street pump and ran off with a sausage stolen from the butcher shop.

## Case Study Cards Grades 5-8:

<p>Thomas Sutterfield, Lawyer:</p> <ul style="list-style-type: none"> <li>● Lives in Hyde Park with wife and two children</li> <li>● The only member of his family to get sick</li> <li>● Won most recent case, defending a Broad Street butcher accused of selling expired meat.</li> <li>● Recovering.</li> </ul>	<p>Slye Children, ages 7, 8 and 10:</p> <ul style="list-style-type: none"> <li>● Three of the eight children of Gideon and Lucy Slye</li> <li>● Gideon Slye is a Broad Street Butcher accused of selling expired meat.</li> <li>● Slye family recently moved to Kings Cross from Broad Street and now have indoor plumbing.</li> <li>● When not in school, three of the Slye children went with their father to work and played on Broad Street Square.</li> <li>● These three children are the only family members to contract cholera</li> <li>● 2 sick; 1 recovering.</li> </ul>
<p>Matilda Wright, Wealthy, 90-year-old:</p> <ul style="list-style-type: none"> <li>● Lived alone (with her three servants) in the family mansion on Marston Court.</li> <li>● Great-aunt of Thomas Sutterfield.</li> <li>● The only person in the house to get sick.</li> <li>● Sick in a matter of hours.</li> </ul>	<p>Mucky Johnson, 18, delivery boy from Coventry Circle:</p> <ul style="list-style-type: none"> <li>● Delivered seafood from Coventry Market to homes on Marston Court Road.</li> <li>● Often stopped to eat lunch and talk to people on Broad Street Square; said the water from the Broad Street pump was the best in the city.</li> <li>● Sick.</li> </ul>
<p>Tolly Martin, 10 years old, professional pickpocket:</p> <ul style="list-style-type: none"> <li>● Occasionally walked far from Soho looking for rich citizens to rob.</li> <li>● Sick for two days after getting a cut in Broad Street Square.</li> </ul>	<p>John and Mary Canty</p> <ul style="list-style-type: none"> <li>● Pulled their cart through neighborhoods, fixing pots and pans.</li> <li>● From Soho</li> <li>● Often stopped to visit John's mother who lived on Butcher Lane.</li> <li>● Both sick with cholera.</li> </ul>
<p>Owen and Obedience Turner, and three children</p> <ul style="list-style-type: none"> <li>● Lived on Paddy Lane behind butcher shop on Broad Street.</li> <li>● Owen Turner earned money cleaning up the messes at the butcher shop.</li> <li>● Entire family sick.</li> </ul>	<p>Twenty-five families on Queens Row:</p> <ul style="list-style-type: none"> <li>● 89 people sick;</li> <li>● 31 recovering.</li> </ul>
<p>9 Families on Butcher Lane:</p> <ul style="list-style-type: none"> <li>● 37 people sick;</li> <li>● 8 recovering</li> </ul>	<p>18 Families on Paddy Lane:</p> <ul style="list-style-type: none"> <li>● 83 people sick;</li> <li>● 7 recovering</li> </ul>
<p>12 families on Ely Street:</p> <ul style="list-style-type: none"> <li>● 60 people sick;</li> <li>● 10 recovering</li> </ul>	

# Broad Street Area Map



**KEY**

- WATER PUMP (represented by a cross symbol)
- OUTDOOR TOILETS (represented by a square symbol)
- PUBLIC BLDG. (SHOPS, WAREHOUSES) (represented by a solid black rectangle)

**KINGS CROSS**

Diagram showing a cross-section of a street with a cross symbol in the center, representing a water pump.

**HYDE PARK (2 MI.)**

Diagram showing a street layout with an arrow pointing to the left, indicating the direction to Hyde Park.

**MARSTON PARK**

Diagram showing a street layout with a large circular feature, representing Marston Park.

**MARSTON PARK**

Diagram showing a street layout with a large circular feature, representing Marston Park.

**ST. BARTHOLOMEW**

Diagram showing a street layout with a large rectangular feature, representing St. Bartholomew.