# Medicine in the 1800s

This half term we have covered three areas of medicine in the 1800s.

- Disease and Infection
- Surgery and Anatomy
- Public Health

All the work is in this pack. The text book pages you need are in a separate document.

You need to read the information on each page, highlight the important facts and then answer the questions.

ONLY do the work you have missed out on.

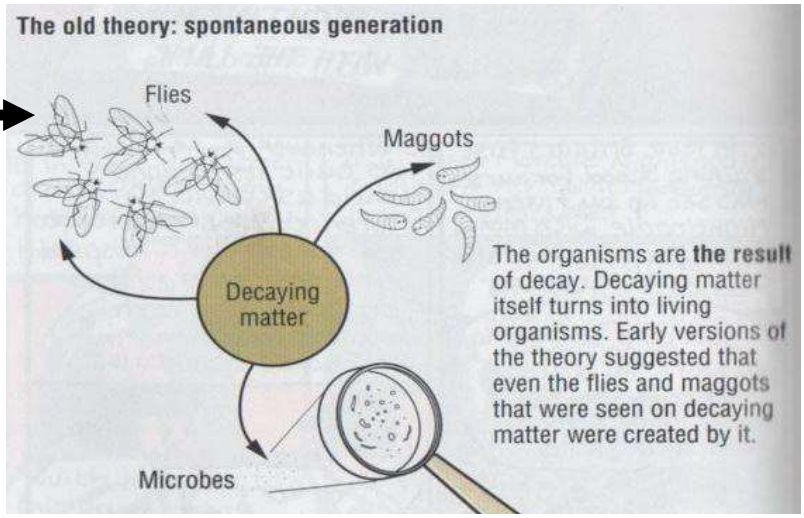
# DISEASE AND INFECTION

## The Greatest Discovery in the history of medicine – GERM THEORY!

In 1796 Jenner discovered the first vaccine yet it was to be another 103 years before the second one. Not really rapid progress. The next 110 years up until today have seen the most amazing story of change in all areas of medicine but especially in understanding ideas about disease and infection. To find out why this occurred we must go back to 1860 and a chemist called Louis Pasteur.

How had ideas developed between Jenner and Pasteur? – SPONTANEOUS GENERATION

Between Jenner and Pasteur ideas about what caused disease were changing. People knew that there were micro-organisms in the air. 'Spontaneous Generation' was the ideas that disease caused these micro-organisms (in reality it is the other way round!)




The NEW idea – GERM THEORY

| THEORY | EXPERIMENT |
|---|---|
| The air contains living micro–organisms | He took sterile flasks out into the streets of Paris, opened them briefly, then sealed them again. Bacteria grew in them. |
| Microbes are not evenly distributed in the air | He repeated the experiment in various places around France including high mountains. The number of bacteria varied. |
| Microbes in the air cause decay | He filled two flasks; one with sterile air and the other with ordinary air. In the first there was no decay; in the second decay proceeded as normal. |
| Microbes can be killed by heating | He heated a material in a flask to make it sterile. He drove the air out, then sealed the flask. It remained sterile even 100 years later. |

SOURCE 2 Pasteur's theories and experiments

Read page 84 of the text book and look at this picture. How did Pasteur discover Germ Theory?

**SUMMARY**

**They used to believe that decay caused micro-organisms (spontaneous generation) they now believed micro-organisms caused decay (germ theory). This was thanks to the brilliance of Pasteur, his swan neck vase and improved microscopes!**

# Was Pasteur a turning Point?

Think about what you decided a 'turning point' really meant. Have a look at the diagram below which shows what happened after Pasteur's discoveries. Would you say he was a turning point?

## The fight against infection: from magic bullets to guided missiles

DURING THE NINETEENTH century doctors and scientists discovered the causes of many illnesses and infectious diseases. They identified the bacteria and started two lines of research in the hope that they would eventually be able to prevent and cure those diseases.

### Line 1 : Prevention

Pasteur began the first line of research with his germ theory

Koch then identified the bacteria which caused specific diseases.


Using Koch's methods the bacteria causing other diseases were quickly discovered.

Pasteur discovered ways of using weakened forms of bacteria to give the body immunity


Following Pasteur other vaccines were developed although very slowly.

In 1906 Calmette and Guerin discovered a vaccine against tuberculosis

In 1913 Behring perfected a diphtheria vaccine.

### Line 2: Cure

Koch set off the line of research by discovering that he could stain certain bacteria


Paul Ehrlich searched for a stain that would also kill the bacteria.


At first this line of research met with little success. It seemed to be hoping for the impossible. But after many patient experiments...


Following Ehrlich, others continued the search for magic bullets.

Watch this clip: https://www.youtube.com/watch?v=CE2InMorIqo

# Why was Louis Pasteur's discovery of Germ Theory a turning point in ideas about disease and infection?

You only have 250 words to complete this question. To do it properly your answer must contain three things. You must explain what understanding was like about disease and infection before Germ Theory, what Germ Theory was and lastly the impact it had on medicine in the future.

# Who Was Robert Koch and what did he do?

By 1870 Pasteur had shown the connection between germs and decay and disease. The next step, linking a particular germ or microbe to a particular disease was made by Robert Koch. He was a German doctor who had the medical knowledge that Pasteur (a chemist) did not have. What can you infer about Koch from this image?

**ROBERT KOCH**
**(1843–1910)**

Robert Koch was born near Hanover. He graduated in medicine from Gottingen University and went to work in Hamburg in 1866. He joined the Prussian army in the war against France in 1870. The French were beaten within six months. After that he became the medical officer in Wollstein, a town near the border with Poland. His wife bought him a microscope for his 29th birthday. It was to affect his life greatly. He went on to be a pioneer of the new science of bacteriology, proving that one specific germ could cause a particular disease in animals and humans. He identified the microbes which caused TB (1882) and cholera (1883). His work caused the German government to set up the Institute for Infectious Diseases in Berlin in 1891. Koch won the Nobel prize in 1905 for his work.

Based in Pasteur's work, Koch identified individual germs. Read page 85 of your text book and make notes here on how Koch identified the first germs…

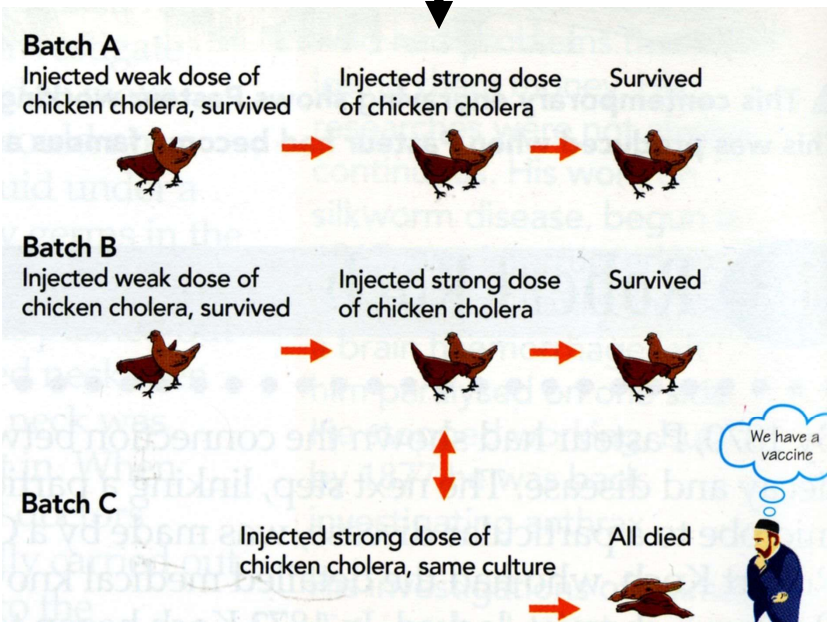
WHAT FACTORS HELPED ROBERT KOCH?

# Pasteur Strikes Back – The 2nd Vaccine in History is found…

Watch this clip : https://www.youtube.com/watch?v=Bodv-_3oH-w

By now fierce rivalry which existed between Louis Pasteur and Robert Koch. This was largely due to a war between their two countries which France lost. Pasteur was determined to win prestige and fame fro France so he set about trying to find a vaccine to cure the disease they could now identify thanks to Koch.

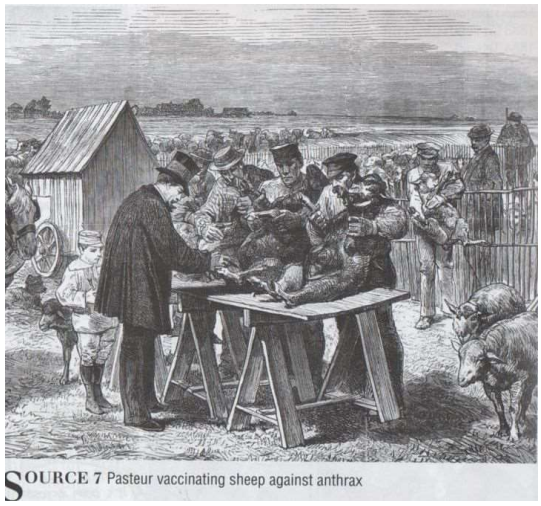
Both men set up research teams who tested possible vaccines. One of Pasteur's research team (Charles Chamberland) was working on Chicken Cholera but forgot to inject the chickens with the liquid germ culture that they were testing. He returned days later from holiday and remembered his mistake. He injected them with the culture that had been left out and the chickens didn't die like normal. Chamberland told Pasteur who tried this experiment.




The same chickens didn't die when given the full strength culture of chicken cholera later on.

Now Pasteur tried an experiment on two more batches, one given a weak then strong dose of the disease and the other just given a strong dose. The first set survived, the second died. They had found a vaccine through Chamberland's 'chance' error. Pasteur then used his individual genius to work out what had happened. The original culture had become weaker in the air when it was left out and was strong enough to immunise the chickens but not kill them. The idea of giving a weaker version of a germ to immunise against the full disease is called **attenuation.**

## Finally – the experiment at Pouilly Le Fort



SOURCE 7 Pasteur vaccinating sheep against anthrax

Read page 87 and this source and look at the picture. Why was this experiment in 1881 so important?

*"On 5th May, M. Rossignol's farm and 60 sheep were placed at M. Pasteur's disposal. Ten of the sheep were left untouched in order that they might later serve for a comparison. Of the remaining 50, 25 were marked with a hole in their ear and were inoculated on 5th May with weak virus and on 17th May with stronger virus. On 31st May none of them had lost fat or gaiety or appetite.*

*On 31 May the 50 sheep were taken and all inoculated with the strongest virus. M. Pasteur predicted that today, 2nd June, the 25 sheep not inoculated would be dead and that the inoculated animals would show no symptoms of sickness. Today at half past one a number of spectators came together to witness the results. At 2 o'clock, 23 of the sheep which had not been inoculated were dead. The 24th died at 3 o'clock and the 25th an hour later.*

*The 25 inoculated animals were sound and frolicked and gave signs of perfect health.*

# What next?

## Microbe Hunters

The work of Pasteur and Koch meant that the real cause of disease was known at last. Pasteur advised people to 'seek the microbe'. A new science of 'bacteriology' was developed with scientists all over the world trying to link specific germs to specific diseases. These scientists were called 'microbe hunters' and they became the new heroes of scientific research.

## Further developments

In the 1850s Louis Pasteur, a French chemist, investigated the problem of liquids turning sour in the brewing and vinegar industries.

More powerful microscopes had recently become available, which meant Pasteur could observe the growth of unwanted small organisms in the liquids.

He discovered heating the liquid killed the bacteria and stopped the liquid going sour.

In 1861 Pasteur published his germ theory, showing that there were microbes in the air and that they caused decay. His work proved the idea of spontaneous generation was wrong because no decay happened if matter was placed in a sealed container. This showed that the microbes causing decay were not produced from the matter itself but were in the air around it.

In 1875, Robert Koch, a German doctor who had read Pasteur's work, decided to investigate whether bacteria were linked to disease. Working with a team of scientists, and funded by the German government, Koch identified the specific microbes that caused the disease anthrax in sheep.

In 1879 Pasteur's team was studying chicken cholera microbes and injecting chickens with the disease. A culture of the bacteria was accidentally left on one side and when it was used, a couple of weeks later, it had become a weakened version, which didn't harm the chickens. Pasteur realised that this could be used as a vaccine to create immunity from that disease for chickens. He called this process 'vaccination' in tribute to the importance of Jenner's work.

Koch identified the microbes causing TB in 1882 and those causing cholera in 1883.

Koch found that chemical dyes could be used to stain specific bacteria so they could be studied more easily under the microscope.

## Does Koch deserve equal credit for the breakthrough in the fight against infectious diseases?

YES –

NO -

After the work of these remarkable men other vaccines were found. However it wasn't possible to prevent some diseases by immunising against them. The search for prevention had developed but the search for cures had only just started…

Read page 89 of your textbook and use it to help you complete this chart -

Science and Technology

Communications

Research Techniques

**FACTORS WHICH ENABLED PASTEUR AND KOCH TO SUCCED!**

Personal Qualities

Chance

War

HW – Can you annotate this diagram to answer the questions? You will need to use this booklet. To answer the question on 'Pasteur's work 1881-85' you will need to read the top of page 88 of the green book !

**Pasteur's work 1857-1865**

HINT - GERM THEORY

1 What did Pasteur conclude from his work with liquids?
2 How did he prove he was correct?
3 What was important about his work with silkworms?
4 What examples can you find of the impact of: technology, government, attitudes – enquiry?

5 What problem did Pasteur fail to solve?

**Koch's work 1873-1880**

HINT - ANTHRAX

6 What did Koch achieve that Pasteur had failed to do?
7 What examples can you find of the impact of: war, technology?

8 Which of Koch's discoveries did Pasteur use when investigating chicken cholera?

**Pasteur's work 1879-1881**

HINT - CHICKENS

9 Which discovery did Pasteur make that would really be important in the future?
10 What did he mean when he said 'Chance only favours prepared minds'?
11 Which factors helped Pasteur at this time?

12 How did Koch react to Pasteur's discovery of vaccines?

**Koch's work 1881-1882**

HINT - TB

13 What was important about Koch's discovery?
14 What is Koch holding in the cartoon on page 131 and why has it been included?

**Pasteur's work 1881-1885**

HINT - RABIES

15 How was Pasteur's key discovery in this period a step forward?

# SURGERY AND ANATOMY

## The problems of surgery in the early 1800s

Surgery in the early 1800s was dangerous and painful. Surgeons had to work quickly. At the Battle of Borodino in 1812 Napoleon's surgeon, Dubois, amputated 200 limbs in 24 hours. There was no way of completely relieving the pain suffered by the patient, nor was it possible to replace blood by transfusion although blood vessels could be tied with ligatures to stop the bleeding. Sometimes operations went dreadfully wrong. Robert Liston was a famous London surgeon who once amputated a leg in two-and-a-half minutes but worked so fast that he accidentally cut off his patient's testicles as well. During another high speed amputation Liston amputated the fingers of his assistant and slashed the coat of a spectator who, fearing that he had been stabbed, dropped dead with fright. Worse was to follow. Both the assistant and the patient died of infection caught during the operation or in the hospital ward. Infection was the greatest danger to patients after an operation. Germs might enter the wound and cause blood poisoning. Almost half of all patients who had leg amputations died from blood poisoning. One famous surgeon, James Simpson, said that 'the man laid out on the operating tables of our hospitals has more chances of death than the English soldier on the fields of Waterloo'.

**SOURCE 2** The novelist Fanny Burney's account of her mastectomy operation in 1811. She survived and lived for many years afterwards

*" … when the dreadful steel was plunged into the breast – cutting through veins – arteries – flesh – nerves – I needed no injunctions not to restrain my cries. I began a scream that lasted unintermittingly during the whole time of the incision – I almost marvel that it does not ring in my ears still! so excruciating was the agony. When the wound was made, & the instrument was withdrawn, the pain seemed undiminished, for the air that suddenly rushed into those delicate parts felt like a mass of minute but sharp & forked poignards [daggers], that were tearing at the edges of the wound, but when I felt again the instrument … I thought I must have expired, I attempted no more to open my eyes – they felt so firmly closed, that the eyelids seemed indented to the cheeks … "*

**SOURCE 3** An account by Professor James Syme of his amputation of a leg at the hip joint. Syme was Clinical Surgeon at Edinburgh Royal Infirmary 1833–69

*" I introduced a narrow knife about a foot long … I cut along the bone, which started, with a loud report, from its socket. Finally I passed the knife around the head of the bone, cutting the remaining portion of the LIGAMENT, and this completed the operation, which certainly did not occupy at the most more than one minute.*

*[My assistant] relaxed [the torniquet so] that we might estimate the size and number of the bleeding vessels. It seemed at first sight as if the vessels which supplied so many jets of arterial blood could never all be closed … a single instant was sufficient to convince us that the patient's safety required all our [speed], and in the course of a few minutes HAEMORRHAGE was effectually restrained by the application of ten or twelve ligatures. "*

# The BIG 3 Problems in Surgery before 1840

Use common sense and general knowledge to complete:

1.Pain. was a problem because _____

_____

_____

_____

The solution would come through the use of _____

Because_____

_____

_____

2.Infection was a problem because _____

_____

_____

_____

The solution would come through _____

Because_____

_____

_____

3. Blood Loss was a problem because _____

_____

_____

_____

The solution came through

_____

Because_____

_____

_____

___

# The development of Anaesthetics

**In the first place if surgery was to advance, surgeons needed some way of easing a patient's pain in order to give the surgeon more time to operate. This is known as an anaesthetic. In the 1840s a number of surgeons experimented with different forms of anaesthetics.**

## *The pioneers of anaesthetics*

**Before 1800**

- **Humphry Davy**, in 1799, in England, accidentally discovered that **nitrous oxide (laughing gas)** eased pain but kept a person conscious.

**1840s**

- **Crawford Long**, in America, noticed that people breathing **ether** - which was sometimes used for fun at parties in the nineteenth century - did not suffer pain. In 1842 he was the first surgeon to use ether in an operation that took place at Jefferson, Georgia. But he did not publish a report on his discovery until 1849.
- **Horace Wells**, a dentist in the USA, used nitrous oxide in 1844-45 to extract a tooth.
- **William Morton**, another American dentist, experimented with ether in 1846 to remove a tooth. **It had a longer lasting effect than nitrous oxide.**
- **John Warren**, in 1846, used ether to help remove a growth from a patient's neck in an operation at Massachusetts Hospital, USA.
- **Robert Liston**, another American, used ether in 1846 when amputating a patient's leg.

Fortunately you don't need to know the names of these doctors who experimented with early anaesthetics- just that the first two attempts were with:

- Nitrous Oxide (Laughing Gas) which had limited use as some people were not affected by it
- Ether which had a stronger effect but was disliked by many because it was inflammable (could ignite/blow up) had a strong smell and irritated the lungs.

Both anaesthetics were steps on the way to finding a suitable solution to the problem of pain. In 1847 a new anaesthetic was discovered by a man named **JAMES SIMPSON** which became more widely used until the early 1900s. This anaesthetic was called **CHLOROFORM**

# James Simpson and the discovery of Chloroform.

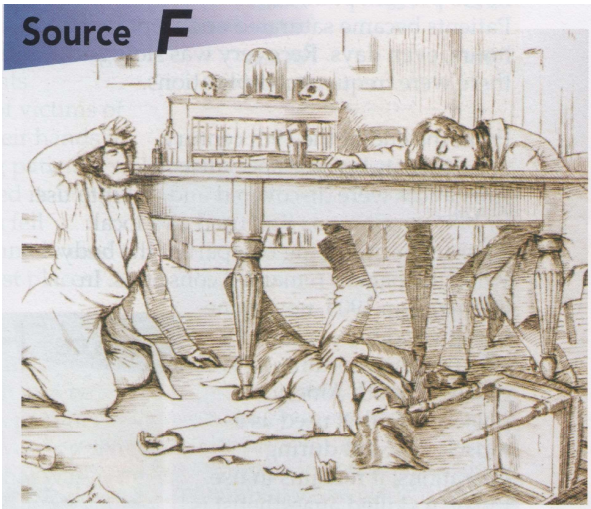
## Simpson's Discovery (Read page 105)

**Source E**

Late one evening Dr Simpson with his two friends and assistants, sat down to their somewhat hazardous work in Dr Simpson's dining room. Having sniffed several substances, but without much effect, it occurred to Dr Simpson to try a material which he had regarded as likely to be of no use whatever; that happened to be a small bottle of chloroform. It was searched for and recovered from beneath a heap of waste paper. [They inhaled the chloroform and passed out.] On awakening Dr Simpson's first thought was, 'This is far stronger and better than ether.'

▲ From H. L. Gordon, *Sir James Young Simpson and Chloroform*, 1897.

**Source F**



▲ A 19th century drawing showing the effect of inhaling chloroform on Simpson and his assistants.

James Simpson found chloroform to be far better than other anaesthetics as it:

- Was easy to administer to patients
- Less was needed
- It took affect more quickly than ether.

Simpson tested chloroform on more than 50 patients before informing the world about it once he was sure it was effective and safe. His main use was for removing pain during child birth. You might be surprised but there was massive opposition to chloroform looking at the boxes below can you guess in pairs why different groups were so opposed? (Answers on page 105)

**Surgeons**

**Patients**

Opposition to anaesthetics

**The Church**

**The army**

## The Queen comes to the rescue! (Read page 106)

The opposition you have just seen continued for 10 years until Queen Victoria used chloroform in giving birth to her child in 1857. After this chloroform quickly overtook the use of ether as an anaesthetic. Problems continued though as some patients never woke up after being given to much chloroform.

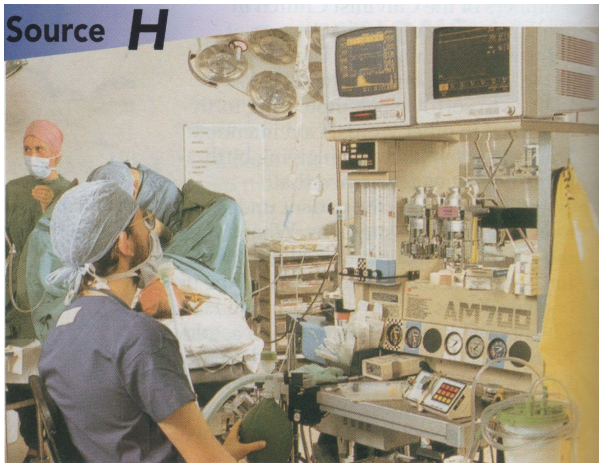
## Was it all progress? The Black Period in surgery

You might think that anaesthetics were only positive in the development of surgery but you would be wrong! The term 'the black period of surgery' refers to the time in the nineteenth century when more people died as a result of infections. These had been caused by operations performed after anaesthetics which allowed the surgeons to operate more deeply inside the body. Surgeons became overconfident as patients felt no pain and tried to perform operations above the skill level of the time.

### Modern Day Anaesthetics

The photo opposite shows how anaesthetics are used in modern day surgery. The anesthetic is a mix of chemicals and TECHNOLOGY is at the centre of the job. The anesthetist is a skilled member of the surgical team who monitors heart beat, blood pressure, breathing and brain waves using the high tech instruments shown opposite. This ensures the patient is safe and pain is effectively removed.

Source H




## What have we learnt so far?

We've gone through quite a lot so give yourself a quick test in silence for the next 5 mins. Can you answer the following questions?

Write down the 3 problems with performing surgery before the late 1800s. As an extention next to them write the 3 correct solutions.

| | Problem | Solution |
|---|---|---|
| 1. | _____ | _____ |
| 2. | _____ | _____ |
| 3. | _____ | _____ |

Name the 3 anaesthetics used in the 1840s (in chronological order)

1. _____
2. _____
3. _____

What was the name of the man who developed anaesthetic number 3?

_____

# Dealing with Infection (Read page 107)

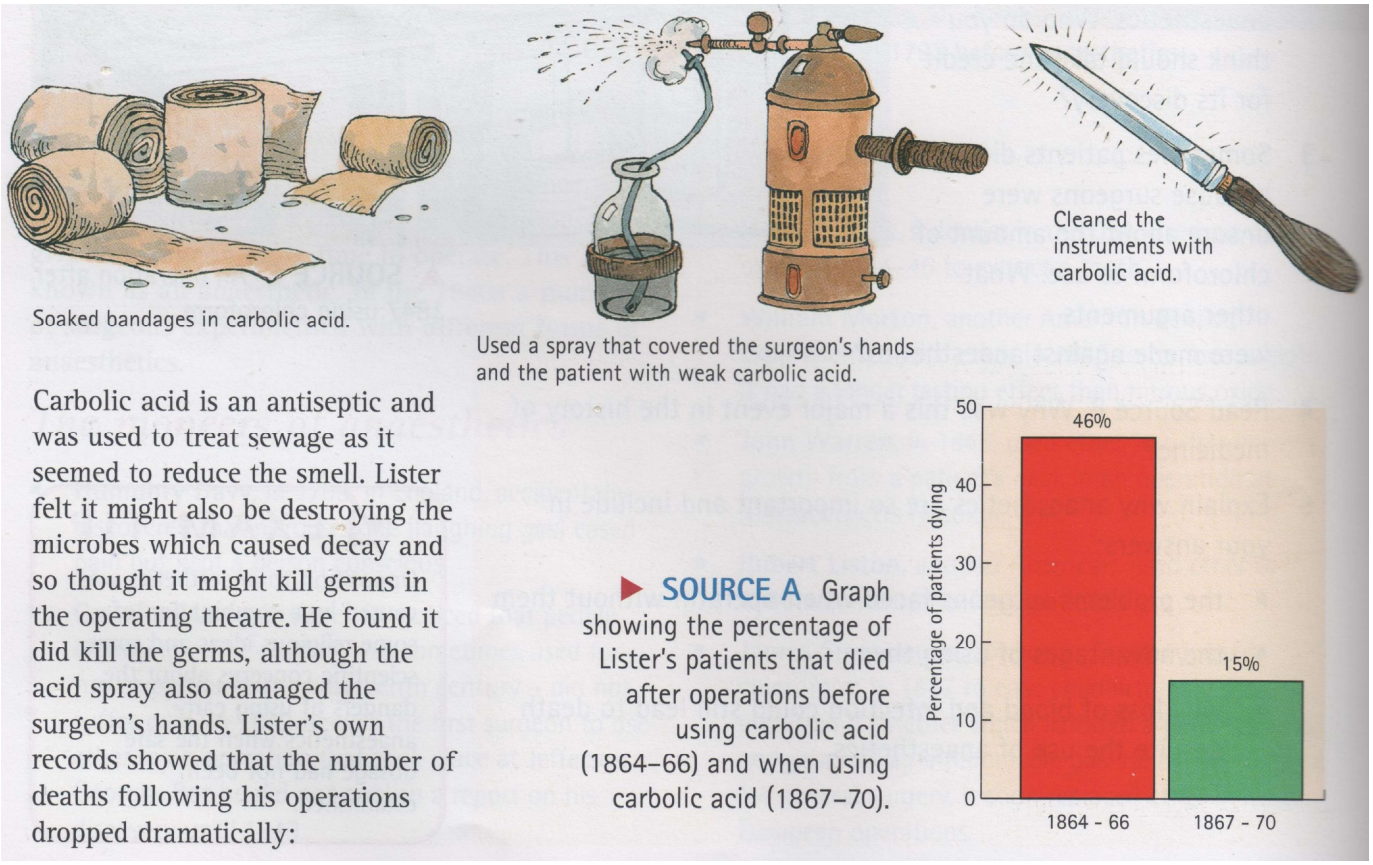
**The Next Big Step: Pasteur's turning point leads to advances in surgery.**

Anaesthetics made a big advance in surgery in the 1840s but as we have seen this was hindered by the increasing number of people who died from infection as a result of deeper surgery in the body. Operating theatres were often very unclean as there was no knowledge of germs so clothes were dirty and instruments were not clean. When Louis Pasteur discovered Germs cause disease in the 1860s there was a rapid advance in the fight against infectious disease. What is often forgotten is that it also led to one of the biggest changes in surgery.

**Joseph Lister applies Pasteur.**

A professor of surgery in Glasgow, Lister was the first to realise that Pasteur's Germ Theory had implications for surgery. He realised he need to kill the germs in the operating theatre and set about doing this as shown below. He developed **Antiseptic Surgery** and the results were dramatic as shown in source A.

## Antiseptic Surgery




The death rate plunged in Lister's operations and it was clear to surgeons that removing germs from operating theatres was crucial to lowering death rates. Lister's methods did have drawbacks in that the use of carbolic acid sprayed all over the operating room, the patient and the surgeon and his instruments damaged hands and lungs as well as creating an unpleasant environment. By the 1890s a new and more effective way of removing germs had been pioneered- **ASEPTIC SURGERY**.

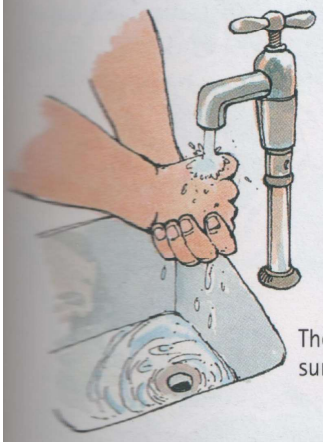
# From Antiseptic to Aseptic Surgery

## *Same idea – different approach*

Carbolic acid created antiseptic conditions because it killed germs, but it was unpleasant to work with and damaged the hands and lungs of surgeons and nurses. In Germany a different but related approach developed. This focused not on killing germs but on keeping them away. This became known as 'aseptic' surgery. The same approach was developed by the US surgeon William S. Halsted, in 1889, after his nurse complained that carbolic acid was ruining her hands. Aseptic surgery led to procedures such as:

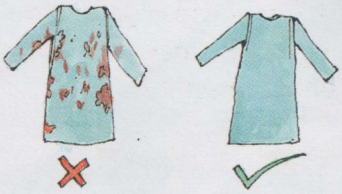
**EXAM TIP**

The relationship between anaesthetics and antiseptics shows that new discoveries do not always lead to immediate progress and can sometimes cause more problems.



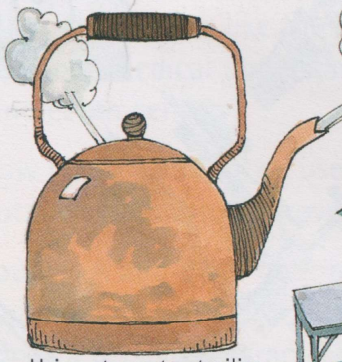
The washing of surgeon's hands

Wearing caps, masks and gowns



Sterlising surgeons' clothes

Wearing rubber gloves



Using steam to sterilise instruments

Keeping operating theatres clean

You have now learnt the two major advances that took place in the 19th Century (1800s) and changed surgery- Anaesthetics and Antiseptics which paved the way for Aseptic Surgery. The dual problems of pain and infection had been removed and surgery could now make great advances. Now you can try an exam question on section B of the Medicine Exam.

# PUBLIC HEALTH

Public health in the 1800's was dreadful. The government didn't care about the health of the individuals at the start of this century. However, over the next 100 years the government began to take an interest. You will study the causes of the First and Second Public Health Acts and their impact. You will also investigate how the role of technology led to developments in the sewers. The final thing we will cover is the development of hospitals.

Read pages 124-5 and make a spider diagram below summing up public health at the start of 1800.

# The First Public Health Act 1848

The actions of Edwin Chadwick + outbreaks of cholera led the government to introduce the First Public Health Act

**Who was Chadwick?**

(Read page 126 and make notes on Chadwick)

**What was the First Public Health Act?**

(Copy the green diagram on page 127)

**Why was change slow to happen?**

(Make notes from page 127)

**What was the impact of the First Public Health Act?**

(Make notes from page 128)

## Story

| Create a title for each paragraph. | The article below examines the causes, symptoms, treatments, and consequences of the Cholera outbreaks. | Summarise each paragraph in 1 or 2 bullet points. |
|---|---|---|

In 1831, cholera arrived in Britain, killing 50,000 people. The main symptoms of the disease was violent sickness, painful diarrhoea, and skin and nails turning black. Finally a victim would fall into a coma and die. So many people were dying that cemeteries were closed because they were too full: bodies that were buried often poked through the surface of the ground, letting off a horrible smell.

Many people still believed in miasma theory and that 'infectious mist' given off by rotting animals, rubbish, and sewage caused infection. People didn't realise the importance of clean water.

In 1837 and 1838 more people died from cholera. In 1839 the government asked Edwin Chadwick to find out what the health and living conditions of poor people was like across Britain. The Chadwick report found that conditions were awful and health was very poor.

Chadwick highlighted the need for cleaner streets and showed people that the public were not to blame for bad housing and living conditions. It put pressure on the government to do something to improve public health but they did not do anything.

The cholera outbreaks changed the minds of the government. When cholera returned again in the 1840s, the **Public Health Act** was signed. This gave local councils the power to spend money on cleaning their towns (but it was not compulsory!). Many towns didn't do anything because they didn't have to!

Cholera returned in 1848 killing 60,000 people. In 1854 another 20,000 died. In 1854, Dr John Snow linked cholera to the dirty water that people were drinking. With government permission, Snow stopped people drinking local water, forcing people to get water elsewhere – there were no more deaths in the street!

Snow proved that cholera was not carried by the air, but was instead caught by coming into direct contact with someone who had cholera, or in this case, drinking some water contaminated by a victim's diarrhoea. John Snow's work pressured the government into changing their policies on public health.

## Source

**A**

**An extract from Chadwick's report published in 1842**

'Disease is caused by bad air and diseases are common all over the country. The bad air is caused by rotting animals and vegetables and filth, when these things are improved, the death rate goes down.

A medical officer should be appointed to take charge of each district. More people are killed by filth and bad ventilation each year than they are by wars. The poor cost us too much…a healthier work force would work harder too…

**B**

**CHOLERA.**

**DUDLEY BOARD OF HEALTH,**

***Church-yards at Dudley***

**Being so full, no one who has died of the CHOLERA will be permitted to be buried after *SUNDAY* next. (To-morrow) in either of the Burial Grounds of *St. Thomas's*, or *St. Edmund's*, in this Town.**

**All Persons who die from CHOLERA, must for the future be buried in the Church-yard at Netherter**

This cartoon entitled "Death's dispensary" was published in a British magazine in 1666. The caption reads 'OPEN TO THE POOR GRATIS [for free] PERMISSION OF THE PARISH'.

**C**


## Scholarship

**Historian Pamela K. Gilbert writing in her essay on Britain's response to Cholera (2007)**

'The progress of sanitary reform was slow. Meanwhile the medical profession increasingly began to see its role in government as protecting the people, but also as disciplining and educating the poor and working classes who were believed not to understand what they needed to do for their own good. Many sanitary reformers assumed that people chose to be dirty. The Government began slowly to move towards a more proactive and interventionist model of care for public health involving prevention, hygiene and education."


**Historian Amanda J. Thomas writing in her book 'Cholera: The Victorian Plague'.**

'Conditions for the labouring poor were not to change for many years, and comprehensive, free health care would only become available to all with the establishment of the National Health Service after WWII…up until the 1960s and beyond, working people continued to live in polluted, densely populated urban environments…had politics not got in the way, perhaps greater progress might have been made…'

**<u>Task 1</u>**

Read through the **Story** of the events of the Cholera epidemic. For each paragraph, you need to create a 'title' on one side, and a short summary (two bullet points maximum) on the other.

**<u>Task 2</u>**

Look at **source** A, B, and C. In your book, write a short description of the message of each source. Then answer the question "What do these sources tell you about impact of Cholera on Britain?"

**<u>Task 3</u>**

Read through Gilbert and Thomas' **scholarship** about the Cholera outbreak. Highlight what you think are the three most important sentences. In your book, answer the question "According to historians, what impact did the government have on the health of the people during the cholera outbreak?"

# The Second Public Health Act 1875

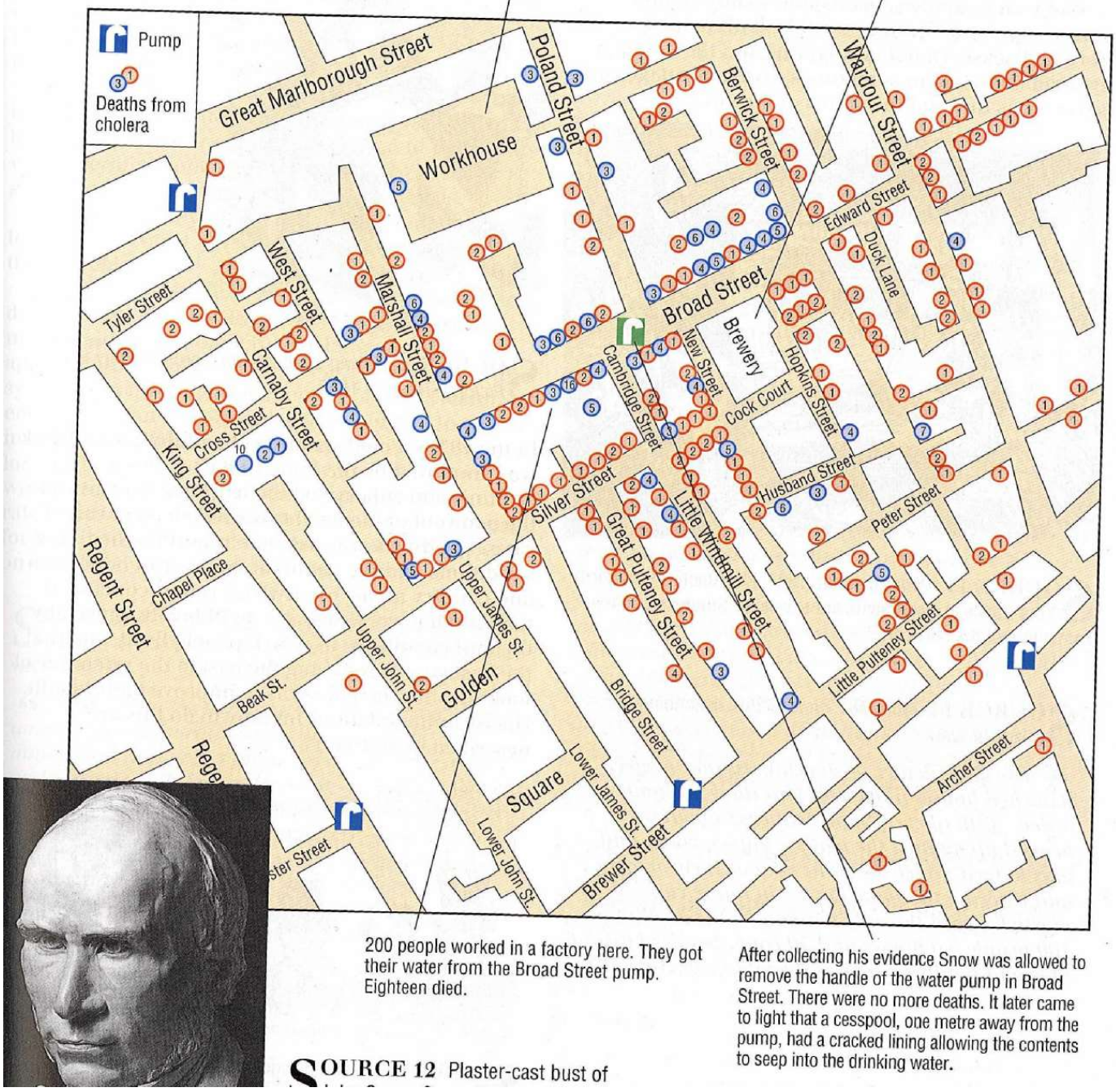
The actions of John Snow + more outbreaks of cholera + the Great Stink + discovery of Germ Theory led the government to introduce the Second Public Health Act

**Who was John Snow? What did he do?**
(Read page 129 and make notes)

A widow living in the suburbs, in an area otherwise clear of cholera, died of the disease. It was later discovered that she had a bottle of water from Broad Street sent to her every day because she liked it.

535 people lived in this workhouse. They got their water from another source. Only five died.

70 people worked at this brewery. It had its own water supply and gave its workers free beer to drink. No one died.






200 people worked in a factory here. They got their water from the Broad Street pump. Eighteen died.

After collecting his evidence Snow was allowed to remove the handle of the water pump in Broad Street. There were no more deaths. It later came to light that a cesspool, one metre away from the pump, had a cracked lining allowing the contents to seep into the drinking water.

SOURCE 12 Plaster-cast bust of

In your own words explain this experiment…

Why do you think many people didn't believe him until Germ Theory was discovered?

## What was the Great Stink?

Part 3: The nineteenth century

### Case Study 1: The Great Stink of 1858

By the 1850s, over 2.5 million people lived in London. It was the largest and wealthiest city in the world, but it was also very unhealthy.

Many Londoners got their drinking water from the River Thames, even though the river was also where they dumped their rubbish – including dead animals and chemicals from factories based by the river. There was no sewage system so human waste ended up in the river as well.

The summer of 1858 was very hot. A thick layer of sewage lay on the water. As temperatures topped 30°C, the smell of the river became unbearable. It became known as the 'Great Stink'. In the Houses of Parliament, MPs found it impossible to use the rooms overlooking the river.

At that time, many people still believed that bad air (miasma) caused disease, so they treated the curtains with chloride of lime. It had little impact and the awful smell remained.

▼ **SOURCE 1** This cartoon was published in *Punch* magazine in June 1858, during the Great Stink. The River Thames is shown as a filthy old man with diseased and deformed offspring

FATHER THAMES INTRODUCING HIS OFFSPRING TO THE FAIR CITY OF LONDON.
*(A Design for a Fresco in the New Houses of Parliament.)*

Can you explain the message in this cartoon?

## What was the Second Public Health Act ?

(Copy the green box on page 128)

Why do you think the second public health act had more impact than the first?

# Bazalgette and the sewers

Watch this

https://www.youtube.com/watch?time_continue=1&v=5k8AnhNkN04&feature=emb_logo

Read This

https://www.museumoflondon.org.uk/discover/how-bazalgette-built-londons-first-super-sewer

Create a mind map on Bazalgette giving background on his character and explaining how he built the sewers.

This is an example of how the factor of TECHNOLOGY has helped in medicine

**1860s Joseph Bazalgette organises the building of London's sewer system**

In the 1850s, many people still believed that bad air (miasma) carried disease, so Londoners were scared by the Great Stink. This chance event forced MPs to take action to clean up the River Thames. They approved money to pay for a new sewage system for London.

It was a major engineering achievement which is still in use today. All London's sewage was pumped out of the city through:

- 83 miles of large sewers, built underground from brick
- 1100 miles of smaller connecting sewers from each street
- pumping stations at regular points to pump the sewage along the pipes.

This project was led by **Joseph Bazalgette**. During the Industrial Revolution, there had been great improvements in technology and engineering. Bazalgette used what he had learned in railway building to design and manage this project.

Most of the work was complete by 1865 and it led to significant improvements in the public health of London. But there was no public health act to enforce improvements throughout the country.

# Hospitals in the 1800s

Read pages 115 – 117 and make detailed notes about how Nursing went from a poor reputation to a professional occupation

Read pages 118-9 and make detailed notes about how women became doctors

# EXTENSION TASK

Create revision cards on the following people
Pasteur, Koch, Lister, Halstead, Simpson, Chadwick, Snow, Nightingale.
These should be laid out in this way…

Name:
Date:
Area of medicine:

Background:

What they are famous for:

Factors that helped:

Importance: ?/10