Industrial Medicine

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Edward Jenner

Smallpox killed more children than any other disease in the 1700s. Survivors were often severely disfigured by scars from the scabs that formed on the skin.

To stop people catching smallpox the technique of inoculation was used in China and other parts of Asia and Africa. This involved spreading pus from a smallpox pustule into a cut in the skin of a healthy person. If the person was lucky they got a mild dose of smallpox and did not catch it again because their body had developed antibodies against smallpox – although they did not know this. If the person was unlucky they got a bad case of smallpox and died.

Lady Mary Wortley Montague watched inoculation carried out in Turkey. During a smallpox epidemic in England she had her daughter inoculated in front of important doctors and the method rapidly became popular.

Inoculation became big business. Robert and Daniel Sutton became very wealthy by carrying out many thousands of inoculations, charging up to £20 per patient. However, there were dangers with inoculation:

- The person inoculated could get a strong dose of smallpox and died.
- The person inoculated could pass smallpox onto someone else.
- Most people could not afford inoculation so were not protected.

Some people thought that the milder disease of cowpox seemed to give protection against smallpox, so deliberately infected themselves with cowpox. However, no doctors had written about or tested this idea scientifically.

Jenner learned a lot from the surgeon John Hunter, who told his students to observe patients carefully and experiment to test their ideas. Jenner's discovery of vaccination followed Hunter's advice exactly. Jenner had long known the story that milkmaids who caught cowpox never seemed to get smallpox and he kept this idea in his mind, thinking how to test it.

In the 1790s Jenner carried out experiments to test the theory, observing and recording all the details carefully. In one of these experiments, Jenner chose a young boy who had not had either cowpox or smallpox. He was called James Phipps. Jenner took pus from a cowpox sore on the hand of Sarah Nelmes, a milkmaid. Jenner made a cut on James' arm and put Sarah's pus into it. James developed

cowpox. Once James had recovered, Jenner took some pus from a smallpox victim and placed it in a cut on James' arm. James did not develop smallpox.

In 1798 Jenner published a book describing vaccination and presenting his evidence, describing 23 different cases. He called this method vaccination because the Latin word for cow is *vacca*.

By the 1800s vaccination was being used in the USA and in 1805 Napoleon had the whole of the French army vaccinated. In 1802 and 1807 Parliament gave Jenner £30,000 to develop his work on vaccination. Fifty years later, in 1852, vaccination was made compulsory in Britain, helping to cause a huge drop in smallpox cases.

However, many people opposed vaccination. An Anti-Vaccine league was formed in 1866. Also, after 1887 parents were allowed to refuse to allow their children to be vaccinated.

There was opposition to vaccination for many reasons, such as:

- Some people believed that smallpox was a punishment for sin, so to prevent people getting the disease would be going against God's will.
- Some people objected to vaccination because it meant that inoculators would lose their jobs.
- The Royal Society said that vaccination was too revolutionary. They refused to publish Jenner's book.
- Some people believed that the government shouldn't interfere in people's lives by making vaccination compulsory.
- Some people argued that they had enough to worry about finding work and food and did not have time to get their children vaccinated.
- Not all vaccinators performed the procedure correctly, so it didn't always work.
- Jenner was just a country doctor, why should anyone listen to him?
- Jenner could not explain how vaccination worked.

Beliefs about causes of disease in the early 1800s

- Two ideas, supernatural explanations and the theory of the Four Humours, had dominated explanations of the causes of disease for thousands of years but in 1800 both were fading fast.
- The idea that miasma (bad air) caused disease had been around for centuries. This made even more sense in the early 1800s when towns were more crowded and filthy than ever before.
- In the 1600s a Dutchman, Anthony van Leeuwenhoek, made a microscope that magnified things by 300 times. He wrote descriptions of what he saw, including tiny living organisms that he found in food, water and human waste. He called them 'animacules' but nobody connected these organisms with disease. In the 1800s Joseph Lister developed a much more powerful microscope, magnifying things 1000 times. Now scientists could study these 'animacules' in detail.
- Spontaneous generation - Scientists used the new microscopes to study the micro-organisms (which we call bacteria or germs) on rotting food and tried to work out when these organisms were coming from. They decided that the organisms were spontaneously generated by the process of decay in, for example, meat and then the organisms spread disease.

Louis Pasteur

Louis Pasteur was born in France on 27 December 1822. In 1847 he earned a doctorate from the École Normale in Paris. After several years of research and teaching in Dijon and Strasbourg, in 1854 Pasteur was appointed professor of chemistry at the University of Lille. Part of the remit of the faculty of sciences was to find solutions to the practical problems of local industries, particularly the manufacture of alcoholic drinks.

One of the main problems for the alcohol industry in Lille was that the alcohol kept going sour. Pasteur studied the liquid under his microscope and saw two differently-shaped micro-organisms: one in the fresh liquid and one in the sour liquid. He concluded that it was the organism that was making the alcohol go sour. Next he was asked by the government to help the wine and milk industries. He suggested that gently heating the liquids (pasteurisation) would kill these organisms or bacteria, making them safe to drink.

As a result of this work Pasteur was convinced that germs in the air were causing the liquids to go sour and perhaps causing disease. His ideas were mocked by scientists who believed in the theory of spontaneous generation, but he had the support of the Emperor of France and the government, who believed that Pasteur's

success was making France respected abroad. They paid for his research assistants and a new laboratory to carry out his experiments with specially designed equipment. Improvements in technology made it possible to have much more precisely designed flasks.

In 1864 Pasteur carried out a series of experiments that convinced scientists that his germ theory was correct and that the theory of spontaneous generation was wrong. He showed that bacteria were causing decay – not being caused by decay.

In 1865 Pasteur was called in to help the silk industry because a disease was killing the silkworms. He proved that the disease was being spread by germs in the air. This was the first time it was proved that germs were causing disease in animals.

In 1865 Pasteur's young daughter's death and a cholera outbreak led him to investigate human diseases. He took samples of air from a cholera ward in a hospital but under his microscope he could only see a mass of bacteria. He could not discover which one was causing cholera.

Louis Pasteur was spurred on by his rivalry with Robert Koch, a German scientist. This rivalry increased during and after the Franco-Prussian War between France and Germany in 1870-71. Pasteur was determined to match Koch's discoveries and so in 1879 he began to build up a research team to make faster progress. The team started work trying to help the farming industry because an epidemic of chicken cholera was killing many thousands of chickens. Pasteur quickly found the bacterium causing chicken cholera.

In the summer of 1880 Pasteur left one of his team, Charles Chamberland, to inoculate a batch of chickens with the germs, but Chamberland forgot and then the laboratory closed for the summer. When Chamberland came back he finally inoculated the chickens, expecting them to die from cholera. However, none of the chickens died. Pasteur instructed Chamberland to inject the chickens with some fresh cholera germs, but again, none of the chickens died. Pasteur surmised that there was something wrong with the fresh germs, and so injected germs from the same batch into different chickens. All of the chickens died. Pasteur worked out that the old germs had been too weak to kill the first group of chickens, but had protected the chickens against the fresh germs, just like Jenner's vaccines.

Now that he knew exactly how Jenner's vaccines had worked, Pasteur could create other vaccines. At first he continued to work on animals, producing a vaccine against anthrax. He tested this successfully in a public experiment and the new spread rapidly round Europe.

After his success with vaccines against animal diseases, Pasteur turned to human diseases. He investigated rabies, testing his vaccine successfully on dogs, but did not know if it would work on people. The chance to find out came in 1885 when he tested his vaccine on Joseph Meister, a boy who had been bitten by a rabid dog. If the vaccine did not work the boy would die. Pasteur gave Joseph thirteen injections over a two-week period. Joseph survived. Now other scientists set to work to follow Pasteur and find vaccines that could prevent other human diseases. Their successes included:

1896 Typhoid
1906 Tuberculosis
1913 Diphtheria
1927 Tetanus

Robert Koch

Robert Koch was born in Germany on 11 December 1843. Koch was a doctor who became interested in Pasteur's work and began to study bacteria himself. He was just as ambitious as Pasteur and just as brilliant at detailed, painstaking work in his laboratory and at working with a team of assistants. They saw each other as rivals, especially after the Franco-Prussian War between France and Germany in 1870-71, which was won by Germany. Both men wanted to be successful to glorify their countries.

In 1866 Koch graduated from the University of Göttingen and he became a District Medical Officer in 1872. In 1873 Koch began to investigate anthrax, a disease affecting animals and people, and discovered the specific bacterium that causes anthrax. This was the first time the specific germ that caused an individual disease had been identified and it was the final proof of Pasteur's germ theory.

In 1878 Koch identified the germ that causes blood poisoning and septicaemia. He also developed new techniques for conducting experiments that influenced the way many other scientists carried out their experiments. He knew that infected blood

contained the septicaemia germ but he could not see these germs under a microscope, and therefore, other scientists were unlikely to believe what he thought to be true without the evidence. He developed ways of staining bacteria so they could be photographed using a new high-quality photographic lens and studied in detail. He also discovered how to grow bacteria on potatoes, which made them easier to study than in a liquid.

By 1880 Koch had developed a method of proving which particular bacterium was causing a disease, which could then be used by other scientists.

Koch was angry when he heard of Pasteur's development of the anthrax vaccine. He thought Pasteur had stolen some of his research on anthrax. He decided to get ahead by becoming the first man to discover the specific germ that causes a human disease. In 1881 he investigated tuberculosis and found a way of staining the bacterium causing the disease that made it stand out from other bacteria and human tissue – it was so small that it had been missed by other scientists.

This was the major breakthrough that Koch had been searching for. His research team was able to use his methods to discover the specific bacterium that causes cholera. Other scientists joined in the hunt, finding the bacteria for the following diseases:

1882 Typhoid
1883 Cholera
1884 Tetanus
1886 Pneumonia
1887 Meningitis
1894 Plague

Surgery

In the early 1800s pain, infection and blood loss were still the three big problems in surgery, just as they had always been. In the 1800s surgeons found answers to two of these problems – pain and infection.

Why was there opposition to anaesthetics?

There were still no effective anaesthetics in the early 1800s. The patient was held down or tied down by the surgeon's assistants while the surgeon operated as quickly as possible.

As speed was the only way of reducing pain, surgeons were used to operating as speedily as possible and speed was considered to be one of the signs of a good surgeon. However, the development of anaesthetics from the 1840s onwards meant that speed was no longer so important and was a huge change for surgeons to get used to.

Step 1: 'laughing gas' (nitrous oxide)

Anaesthetics developed partly because of improved knowledge of chemistry. Scientists were finding that certain chemicals could have an effect on the human body. In 1799 Sir Humphrey Davy discovered that 'laughing gas' (properly called nitrous oxide) reduced the sensation of pain. He suggested that it might be used in surgical operations and by dentists.

However, nitrous oxide did not make patients completely unconscious, so it was not a complete answer to the problem of pain. Also, when an American dentist, Horace Wells, used nitrous oxide in a public demonstration his patient was in agony. This killed confidence in nitrous oxide as an anaesthetic.

Step 2: ether

Some successful operations were performed using ether from 1846. However, ether had severe drawbacks as an anaesthetic. It irritated the eyes and lungs, causing coughing and sickness. It could catch fire if close to a flame and had a vile, clinging smell that took ages to go away. Finally, ether came in a large, heavy bottle that was difficult to carry around.

Step 3: chloroform

James Simpson was Professor of Midwifery at Edinburgh University. He had used ether but was searching for a better anaesthetic. One evening in 1847 he and several colleagues sat around a table experimenting with different chemicals to see what anaesthetic effects they had. Simpson wrote later, 'I poured some of the Chloroform fluid into tumblers in front of my assistants, Dr Keith and Dr Duncan, and myself. Before sitting down to supper we all inhaled the fluid, and were all "under the table" in a minute or two, to my wife's consternation and alarm.'

Simpson realised that in chloroform he had discovered a very effective anaesthetic. Within days he started using it to help women in childbirth and other operations. He wrote articles about his discovery and other surgeons started to use it in their operations.

Chloroform was the most effective anaesthetic yet discovered, but that didn't mean it was problem free. Some patients took a long time to regain consciousness and vomited for a long time afterwards.

<u>Opposition to chloroform</u>

Chloroform was a new and untested gas. No one knew for sure if there would be long-term side effects on the bodies or minds of patients. They did not know what dose to give to different patients.

In 1848 Hannah Greener died while being given chloroform during an operation to remove her toenail. This first death from the use of chloroform scared surgeons and gave opponents of anaesthetics powerful evidence of their danger.

Anaesthetics did not necessarily make surgery safer. With a patient asleep, doctors attempted more complex operations, thus carrying infections deeper into the body and causing more loss of blood. The number of people dying from surgery may have increased after the discovery of anaesthetics. In the 1870s some surgeons stopped using chloroform as they were concerned about the high death rate (1 in 2500 operations) and returned to using ether mixed with nitrous oxide.

Letter to the medical journal *The Lancet* in 1849:
'The infliction [of pain] has been invented by the Almighty God. Pain may even be considered a blessing of the Gospel, and being blessed admits to being made either well or ill.'

Some people were particularly opposed to the idea of easing the pain of childbirth – believing that this would be unnatural. Letter to the medical journal *The Lancet* in 1853:

'It is a most unnatural practice. The pain and sorrow of labour exert a most powerful and useful influence upon the religious and moral character of women and upon all their future relations in life.'

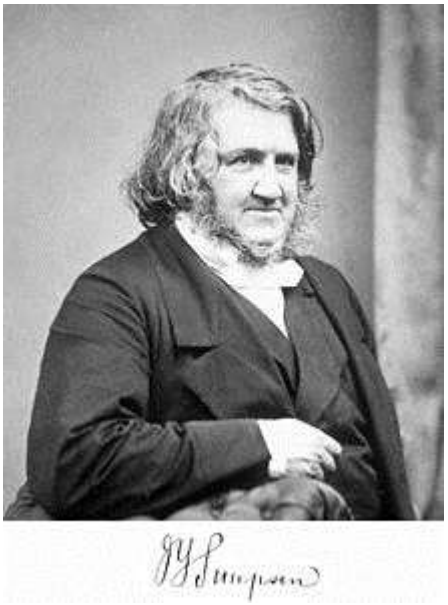
A quotation from Army Chief of Medical Staff, 1854:
'... the smart use of the knife is a powerful stimulant and it is much better to hear a man bawl lustily than to see him sink silently into the grave.'

Why was opposition to chloroform overcome?

The struggle continued for ten years, with anaesthetics gradually winning wider acceptance. James Simpson continued to play a leading role, presenting a powerful case for the use of chloroform as an anaesthetic. He brought the example of Ambroise Paré to his defence.

The final breakthrough came when Queen Victoria accepted the use of chloroform during the delivery of her eighth child in 1857. She publicly praised 'that blessed chloroform'. The support of the queen meant opposition to anaesthetics was doomed.

However, all problems were not solved. Over time the use of anaesthetics improved. Other chemicals were used which relaxed muscles as well as simply putting patients to sleep. New chemicals also had fewer side-effects than chloroform. Local anaesthetics were developed as well as general anaesthetics. This took time – but Simpson's use of chloroform had been the key turning point.



Why was there opposition to antiseptics?

The idea of operations without anaesthetics is dramatic and horrible. Such operations did kill patients because the shock of the incision could kill. However, many more patients survived the operation but then died from something much less dramatic – infection. Doctors had used liquids such as wine and vinegar to keep wounds clean for centuries but, before Pasteur's germ theory, no-one knew what was causing infection in open wounds. That was why surgeons did things that seem obviously dangerous today. They reused bandages, spreading gangrene and skin infections from patient to patient. They did not wash their hands before an operation, nor did they sterilise their equipment, and some operated wearing old pus-stained clothes. This was how they had carried out operations for years. It was what they were used to.

Ignaz Semmelweiss

In 1847 Dr Ignaz Semmelweiss introduced hand washing on the maternity ward in the General Hospital in Vienna. Semmelweiss was worried by the deaths of healthy women after childbirth. Most doctors regarded this as inevitable, but Semmelweiss realised that women whose babies were delivered by midwives were much less likely to die from infection than women whose babies were delivered by medical students. He believed the reason was that medical students came straight to the delivery rooms from dissecting dead bodies. If they simply washed their hands, he though, they would reduce the risk of infection to women. Semmelweiss pursued his crusade with great passion, calling doctors who did not wash their hands 'murderers'. Unfortunately he had little support and nobody built on his ideas.

Joseph Lister

Joseph Lister's use of carbolic acid to prevent infection was as important a turning point as Simpson's use of chloroform. Lister was one of the outstanding surgeons of the nineteenth century. He had researched gangrene and infection, and had a keen interest in the application of science to medicine. That was why he knew all about Pasteur's work on germ theory, which helped to spark the idea for his own discovery. The answer is sewage. Lister had heard about how carbolic acid had been used to destroy parasites in the sewage of Carlisle. He experimented with using carbolic in treating people who had compound fractures where the bone breaks through the skin. Infection often developed in these open wounds. Lister applied carbolic acid to the wound and used bandages soaked in carbolic. He found that the wounds healed and did not develop gangrene.

Opposition to Lister's use of carbolic

Lister's carbolic spray, which soaked the operating theatre, seemed very extreme. It cracked the surgeon's skin and made everything smell. The new precautions caused extra work, and made operations more expensive and less pleasant for the surgeons. One doctor wrote:
'The whole scene of an operation was covered in carbolic spray which dispersed its globules into every nook and cranny of the wound. Our faces and coat-sleeves often dripped with it. It was a relief to us all when the spray was abandoned. It was costly and cumbersome and often broke down.'

Despite anaesthetics, surgeons were still convinced that speed was essential in an operation – often because of the problem of bleeding. It seemed that Lister's antiseptic methods just slowed down operations.

When some surgeons did try copying Lister's methods they did not achieve the same results. This was usually because they were less systematic, but that didn't stop them criticising Lister. Others argued that antiseptics actually prevented the body's own defence mechanisms from operating effectively.

Pasteur's ideas had spread very slowly. Even trained surgeons found it difficult to accept that there were tiny micro-organisms all around which could cause disease. One surgeon regularly joked with his assistants that they should shut the door of the operating theatre in case one of Mr Lister's microbes flew in.

For many centuries surgeons had lived with the idea that many of their patients would die. When Lister said he achieved good results, their first reaction was disbelief. For many the next reaction was to feel defensive, that Lister was criticising them for letting patients down.

Lister was not a showman like Pasteur. He did not give impressive public displays. Indeed, he appeared to be cold, arrogant and aloof and was sometimes critical of other surgeons. Many surgeons regarded him as a fanatic.

Lister was always changing his techniques. He did this because he wanted to find a substance that would work equally as well as carbolic spray, but without the corrosion that it caused. His critics simply said he was changing his methods because they did not work.

How did Lister help to change surgery?

Despite opposition, Lister's methods marked a turning point in surgery. In 1877 he moved to London to train young surgeons. Then came a link to another great name in medical history. In 1878 Robert Koch discovered the bacterium which caused septicaemia (blood poisoning). This gave a great boost to Lister's ideas.

By the late 1890s Lister's antiseptic methods (which killed germs on the wound) developed into aseptic surgery, which meant removing all possible germs from the operating theatre. To ensure absolute cleanliness:

- Operating theatres and hospitals were rigorously cleaned.
- From 1887 all instruments were steam-sterilised.
- Surgeons abandoned operating in their ordinary clothes and wore surgical gowns and face masks.
- In 1894, sterilised rubber gloves were used for the first time. For however well surgeons' hands were scrubbed, the y could still hold bacteria in the folds of skin and under the nails.

With two of the basic problems of surgery now solved, surgeons attempted more ambitious operations.

- The first successful operation to remove an infected appendix came in the 1880s.
- The first heart operation was carried out in 1896 when surgeons repaired a heart damaged by a stab wound.

Female doctors

Women had always provided the bulk of medical care and were often very knowledgeable about, for example, herbal remedies but a new law in 1852 required all doctors to belong to one of the Colleges of Surgeons, Physicians or Apothecaries. All were closed to women. Despite this, a handful of women fought to become doctors. Elizabeth Blackwell, the first woman to qualify as a doctor in the USA in 1849, was an inspiration, travelling to England in 1859 when she met Elizabeth Garrett. Garrett was the first woman to qualify as a doctor in Britain, but she had to overcome huge obstacles to do so.

During the 1860s Elizabeth Garrett worked as a nurse and then attended lectures at the Middlesex Hospital. Male students at the Middlesex Hospital protested that Elizabeth Garrett should not be allowed to attend lectures.

Elizabeth Garrett passed all the exams to qualify as a doctor. The final step before she could work as a doctor was to become a member of one of the Colleges of Surgeons, Physicians or Apothecaries. The Colleges of Surgeons and Physicians refused to allow women members, which therefore stopped Garrett working as a doctor. She had to take the College of Apothecaries to court before it accepted her as a member. After that it too changed its rules so that women could not become members.

In 1874 six women, led by Sophia Jex-Blake, completed the medical course at Edinburgh University. Edinburgh University said it could only give medical degrees to men. The women had to complete their degrees in Dublin or Switzerland.

In 1876 a law was passed opening all medical qualifications to women. For five years after 1876 the Royal College of Surgeons refused to allow anyone to take exams in midwifery as a way of preventing women from learning alongside men.

Hospitals in the early 1800s

Conditions in hospitals in the early 1800s:

- Cramped, stuffy wards helped infections to spread quickly.
- Death rates from infection were high because wards were not cleaned often enough or effectively enough.
- There were few toilets and the sewerage system was poor, so infections spread easily.
- Nursing staff were not trained.
- Nurses were often criticised for being dirty or drunk.

For many people, hospitals were places where they went to die – if not from the disease they had when they went in, then from another disease they caught on the wards. Anyone who had the money paid for nurses and doctors to visit them at home. Even operations were carried out at home because it seemed a healthier place than a hospital ward.

Florence Nightingale

Born into a wealthy family, Nightingale horrified them by wanting to be a nurse. She trained in Germany, returning to work as a nurse and becoming Superintendent of Nurses in a London hospital.

When she heard reports of the terrible conditions in the Crimea she talked to the Minister for war, Sidney Herbert, who was a family friend. He arranged for her to take 38 nurses to the Crimea.

Arriving at the army hospital at Scutari, Nightingale was appalled by the dirty conditions. She concentrated on cleaning the hospital and patients. She wrote back to the British government:

'It appears that in these [army] hospitals the washing of linen and of the men are considered a minor detail. No washing has been performed for the men or the beds – except by ourselves. When we came here there was neither basin, towel nor soap in the wards. The consequences of this are fever, cholera, gangrene, lice, bugs, fleas.'

The death-rate in the hospital fell from 40 per cent of wounded to 2 per cent. Nightingale and her nurses worked at the hospital rather than visiting the frontline of fighting.

Nightingale returned to Britain a national heroine and this helped her raise money to set up her first nursing school. Training focused on hygiene and cleanliness to prevent infections and diseases spreading in hospitals.

In 1859 she wrote her book *Notes on Nursing* and in 1863 *Notes on Hospitals*. Both books were very influential all over the world, providing the basis for training nurses and hospital design. As in the Crimea, her work concentrated on cleanliness and providing fresh air.

Mary Seacole

Born in Jamaica, the daughter of a local healer, Seacole became a very knowledgeable healer and midwife. She gained more experience in Panama where she showed people how to deal with an outbreak of cholera, isolating patients and cleaning out dirt. She also treated gunshot wounds.

In 1854 she travelled to Britain and volunteered her services to the army, but nobody would see her. She paid her own way to the Crimea.
Seacole set up her 'British Hotel' providing food and drinks to the soldiers. She also treated sickness and tended the wounded on the battlefield. Her bravery in helping the wounded while fighting continued made her hugely popular and highly respected among the soldiers.

Seacole returned to Britain without money. Ex-soldiers and *The Times* newspaper tried to raise funds to helped her, but this failed when the organising company went bankrupt. After publishing her memoirs she was better off, but nobody in Britain tried to use or learn from her medical skills.

An extract from a poem published about Mary Seacole in *Punch* magazine, 1856, after Seacole returned to Britain:
She gave her aid to all in need
To hungry, sick and cold
Open hand and heart, ready to give
King words, and acts, and gold
And now the good soul is 'in a hole
What soldier in all – the land
To set her on her feet again
Won't give a helping hand?

Public Health, 1800-1914 – The Paper 2 Topic

Timeline of 19th century public health developments

1830s	Great improvements are made in microscope technology, allowing people to see microorganisms in water.
1831-1832	Cholera epidemic in British towns. This kills both the rich and the poor.
1842	**Edwin Chadwick** publishes his 'Report into the Sanitary Conditions of the Labouring Population of Great Britain.' He writes that poor people are living in dirty conditions which cause a huge amount of illness, so people are too sick to work. He suggests that, by improving drainage and sewers, removing waste from streets, providing clean water supplies and appointing medical officers, fewer workers would fall ill.
1848	Chadwick's recommendations led to the first **Public Health Act**. Towns are told to clean up, but there is no punishment from the government if they do not. There was opposition as people did not want to pay taxes for improvements to the towns, especially the rich people who were living quite well, and had a laissez-faire attitude to the poor. Some people did not like the interference of the government. It set up the General Board of Health.
1849	Another outbreak of **cholera**. John Snow publishes *On the Mode of Communication of Cholera*. He **proves that cholera is spread through water**, not bad air.
1853	**Compulsory vaccination** against smallpox.
1854	John Snow continues to publish proof that **cholera is spread through water** by testing deaths around the Broad Street pump. Clean water is essential to prevent cholera. General Board of Health is disbanded.
1855	**Nuisance Removal Act** makes overcrowding illegal.
1856	London Board of Works established to supervise public works around the city. **Joseph Bazalgette** elected its chief engineer.
1858	The **Great Stink** in London – the summer is very hot and the smell from the River Thames grows worse and worse – the worst smells were at the Houses of Parliament.
1861	Pasteur publishes his **germ theory**, proving bacteria causes disease.
1864	Pasteur proves that his **germ theory** is correct.
1864	Unhealthy conditions in factories are made illegal in the **Factory Act**.

1866	Towns must had a **clean water** and **sewage system** as soon as possible – **inspectors** will check. London sets the standard as **Bazalgette's** sewer system means that most of London is connected to a sewer.
1867	Poor working men get **the vote**.
1868	A law is passed to improve or demolish slum housing.
1875	**Artisans Dwelling Act** makes it law that landlords keep their houses in good condition and allows councils to demolish homes that are not.
1875	**Food and Drugs Act** makes it illegal to sell food or drugs that are 'not of the proper nature'.
1875	**Public Health Act:** towns must keep streets clean, sewers must be cleaned. Towns can charge taxes to do this. The Act made it **compulsory** on local councils.
1876	**River Pollution Prevention Act** makes it illegal for factories to dump their waste, including chemicals, into rivers.

Why wasn't anything done to protect people's health in the early 1800s?

Pasteur's germ theory was not published and accepted by scientists and doctors until the 1860s. Pasteur's discovery of the value of boiling milk (pasteurisation) did not become common until the 1880s because many people believed that boiling killed the goodness.

Towns had grown very fast. Landlords made profits from renting out houses, so wanted them built quickly.

The towns of the medieval period were not densely packed with rows and rows of buildings as we see them today. Within a town there were gardens for growing vegetables and keeping pigs and chickens. There were also orchards of fruit trees. Industry and changes in agriculture brought more people into the towns.

The spaces filled up with factories and poor quality housing. Anyone who owned land could build on it without planning permissions – and there were no building standards regulations. People did not believe the government had the right to tell people what to do with their land. They expected 'no intervention' policies from the government. The term used for this is 'laissez-faire'.

Governments were still not expected to play a major part in improving the living and working conditions of the people. There were no pensions or help for the sick and unemployed from governments. The first income tax was collected in 1798 and stayed low in the 1800s.

There was a strong belief that people should help themselves to live better, healthier and more comfortable lives. People objected to local and national governments 'interfering' in their lives. The protests against compulsory smallpox vaccinations are a good example.

Railways were not built to take people in and out of town centres in large numbers until the 1850s and later. Workers therefore had to live close to their places of work.

Attempts at providing fresh water and removing sewage and rubbish were often inadequate. Sewage was discharged into rivers, overflowing cesspits or even into the street. Smoke from houses and factories filled the air. Diseases like smallpox, influenza, typhus and typhoid fever were common. Doctors were not paid by the government, so had to charge fees to their patients. Therefore the poor could not afford to go to a doctor.

Fresh food was difficult to get in many towns because it had to be brought in by horse and cart and was expensive. Food was often adulterated – mixed with other things (chalk in bread, sand in sugar, sawdust in flour) – by shopkeepers to increase its weight and so make more money from sales.

Working conditions were at least as bad as home conditions. Workers in mines, workshops and factories had long hours and only very short breaks. Their toilet and washing facilities were very poor, with many people sharing one privy and only a pipe to wash at. Many people also fell ill from the work itself, swallowing coal and textile dust, which caused lung diseases.

Many rich people did not want to have to spend money on improving public health and many did not see the need for it even if they would be willing to pay.

The impact of cholera epidemics

Cholera was extremely prevalent in London in the 19th century due to the manner in which it was spread. Cholera is a water-borne disease that emerges from a bacterium called Vibrio cholerae. Once someone contracts the disease, they can experience symptoms ranging from extreme dehydration, to diarrhoea, to vomiting. If not treated immediately, cholera can lead its victim into a prolonged and painful death. Though cholera had flourished in parts of Asia for centuries, it flourished in London due to the city's lack of an efficient sewage system. The city's waste poured directly into the Thames, which in essence became a giant sewer. Had the

misuse of the Thames been the only issue facing Londoners at the time, the problem of cholera would not have been as widespread. Yet in 19th century London, the entire city's drinking supply was taken from the Thames. People were literally drinking and bathing in each other's waste.

When cholera first emerged, no one thought to identify the poisoned drinking water as the source of the contagion. In fact, the idea that cholera was water-based would not be introduced until nearly two decades after its initial outbreak. The most commonly held theory was that cholera was spread via the air through a cloud-like miasma. Others firmly believed that, since the disease spread more rapidly through the poorer districts, that the wealthy were purposely poisoning the poor. Still more believed that cholera was a visitation from God and that He was exacting a punishment on the community for their sins. Such beliefs might seem far-fetched today, but at the time were not wholly unusual. Knowledge of microbes and bacteria was just beginning to emerge and only a scientific elite were aware of their existence.

The 1831 cholera epidemic

The disease that we now know as cholera originated in India, probably in the Ganges delta. The first cholera pandemic began in 1817 when the disease spread by trade routes from India to other countries in Asia, including China and Japan, and to southern Russia. From Russia it spread through Europe, and in 1827 another pandemic broke out.

The disease was referred to as Cholera Morbus in order to distinguish it from common or English cholera, dysentery and food poisoning that were already common in the UK, particularly during warm weather. These diseases are now more commonly referred to as gastroenteritis. In the early years there was considerable confusion between the two diseases.

The slow but steady progress of the disease across mainland Europe was watched with great concern in the UK, and attempts were made to prevent its arrival. In 1831, the Privy Council put all ships arriving in England from Russia under quarantine. It also reconstituted the Central Board of Health, initially set up in 1805 due to concern about yellow fever, which met daily from June 1831 to May 1832. Its powers were limited, and parochial Vestry Committees were those responsible for actually taking measures within their own localities. They were often ineffective and slow to act.

As the disease spread to Hamburg, the quarantine was extended to all ships arriving from the Baltic ports. The first incidence of cholera in England occurred in Sunderland in October 1831 when a ship carrying sailors who had the disease

docked at the port. The ship was allowed to dock because the port authorities objected to, and therefore ignored, instructions from the government to quarantine all ships coming from the Baltic states.

The first confirmed case was that of William Sproat, a keelman who lived near the quayside. He fell ill on 23 October and died after three days. The authorities were not notified until four days later, when James Butler Kell, a local army surgeon who had gained experience of cholera during an epidemic in Mauritius, went over the head of Dr Clanny, the head of the local Board of Health. In early November the Board finally admitted that cholera has struck in the town, but when the resulting quarantine on ships from Sunderland severely affected local trade, some of the businessmen of the town formed an 'anti-cholera' party. Under pressure, many of the local doctors retracted their opinion that the victims were suffering from cholera. This was widely reported nationally, causing a scandal and a boycott of Sunderland.

The disease ran its course in Sunderland, resulting in 215 reported deaths. By late December it appeared to have been contained, but the infection had already spread to Gateshead, where it broke out suddenly and violently on 25 December, resulting in 115 cases and 50 deaths by the following day.

Cholera went on to spread throughout the country. In February 1832, Parliament's Cholera Morbus Prevention Act became law and allowed some powers to local Boards of Health. By this time the country was already in the grip of the epidemic however, and it was too late for the Act to have much impact. In Britain, 32,000 people died of cholera in 1831 and 1832.

Despite the fear and panic that the disease inspired, once the epidemic ceased, very little was done to prevent its recurrence. When the next pandemic reached the UK in 1848, the issues that had made the epidemic so deadly had not been addressed: living conditions for the poor were still cramped and unhygienic, sewerage was unsatisfactory in most towns and water supplies were still vulnerable to contamination. 62,000 people died in a two-year outbreak.

The 1848 cholera epidemic

By 1847 the government was well aware that cholera was likely to appear again in Britain. Diarrhoea, dysentery and English cholera were common in the summer, but a full-blown epidemic was a frightening prospect with the memory of the 1832 outbreak still vivid in the population's memory. In his role as Metropolitan Commissioner of Sewers, and fearful of an epidemic, Edwin Chadwick demanded that Assistant Surveyor Lovick instigate the flushing out of the River Thames

every two to three months to eradicate the bad smells emanating from the sewers, which for the many of those who supported the theory that disease was transmitted by miasma was essential to avoiding a cholera epidemic. From March to May 1848, 29,000 cubic yards of effluent were flushed into the river, and between September 1848 and February 1849 another 80,000 cubic yards were flushed. Not only was this an unpopular move, as the Thames became more polluted, but it is evident from the Lambeth District Sanitary Reports that this cannot have been particularly effective, as in Lambeth, for example, the smells from the sewers continued to be particularly offensive.

The second major epidemic of cholera began in Scotland in October 1848, but did not establish itself in London until February 1849. In relation to the number of fatalities, this was the most serious of all 19th century epidemics and around 53 000 deaths were registered for England and Wales compared to around 20 000 for the 1831–1832 epidemic. Between 1845 and 1856 over 700 individual works were published in London on the subject of cholera. The majority were concerned with explaining both the course of the disease and, most importantly, the way in which it spread through a population.

The 1853 cholera epidemic

See the section below on John Snow.

The 1866 cholera epidemic

In 1866 cholera attacked Britain for the fourth and final time in an epidemic which struck with extreme ferocity in the East End of London, killing very nearly four thousand people there between the end of July and the beginning of November. It is generally agreed that it was the action (or, more accurately, the negligent inaction) of the East London Water Company which decisively determined the spread and scale of the outbreak. This failure was largely due to disagreements about the cause of the outbreak. Whilst John Snow had proved that cholera was transmitted through water, many doctors and scientists subscribed to the view that Snow had not proved that it could be transmitted **solely** through water. These views made it easier for the East London Water Company to claim that it was not responsible for the cholera outbreak.

Edwin Chadwick

Edwin Chadwick was a civil servant who worked for the poor law commission in the 1830s and 1840s. In 1842 he wrote his 'Report on the Sanitary Conditions of the Labouring Population.' Chadwick's report drew the following conclusion:
1. The poor live in dirty, overcrowded conditions.
2. This causes a huge amount of illness.
3. Many people are too sick to work and so become poorer still.
4. Therefore other people have to pay higher taxes to help the poor.

Chadwick recommended the following ways to cut taxes and save money in the long run:

- improve drainage and sewers
- remove refuse from streets and houses
- provide clean water supplies
- appoint medical officers in each area to check the reforms.

There was opposition to Chadwick's report. Many local tax-payers did not want to pay for improvements, even though it meant lower taxes in the long run. The government was not happy either: it knew that local councils did not want the national government interfering in local matters. However, another outbreak of cholera in 1848 helped persuade the government to introduce the Public Health Act 1848. In the Act:

- A National Board of Health was set up.
- In towns where the death rate was very high, the government could force the local council to make public health improvements to water supplies and sewerage and appoint a Medical Officer of Health.
- Local councils were encouraged to collect taxes (called rates) for public health improvements if they had the support of local rate-payers.
- Councils were allowed to appoint Medical Officers of Health to oversee public health.

Whilst some towns did make changes as a result of the Act, most councils did nothing. The National Board of Health had been disbanded in 1854 because it was unpopular. More outbreaks of cholera in 1853 and 1865 showed that the first Public Health Act had not gone far enough.

Chadwick had been a member of the National Board of Health, but he retired when it was disbanded in 1854. Chadwick's main weakness was that he did not know how to get other people on his side. He was argumentative, arrogant and rude as well as extremely hard-working. Until his death, Chadwick continued to believe that disease was caused by miasma. He did not accept Pasteur's germ theory.

William Farr

William Farr was a pioneer in the field of medical statistics. He was a qualified doctor who in 1838 was appointed to the General Register Office – the government department responsible for recording births, marriages and deaths.

Here his most important contribution to public health was in setting up a system that routinely recorded the cause of death. Such detailed statistics provided the raw data which allowed a far more detailed analysis of death within the general population. For example, the mortality rates of different professions or of those living in different locations could be compared.

Like most of his medical contemporaries, Farr subscribed to the miasma theory of disease. As such he took particular interest in environmental conditions. For example, he suggested that in low-lying ground along the banks of the River Thames the concentrations of deadly miasmas would be greater than on higher land situated further away from the river. This seemed to be confirmed in his report on the 1849 cholera epidemic, published in 1852, where Farr's statistical calculations suggested a link between deaths and land elevation. This was promoted as further evidence of miasma theory.

Although they disagreed over the cause of cholera transmission, John Snow used the detailed statistics produced by Farr when developing his own alternative theory. However, William Farr remained unconvinced by Snow's work, and when Farr's committee reported on the next cholera outbreak - centred on the Broad Street pump - they made a point of dismissing Snow's proposal of a waterborne mode of transmission.

Farr was finally converted to Snow's theory in the wake of the final London cholera epidemic of 1866. Snow's report showed a clear link between victims of the epidemic and one particular water source, which in his opinion suggested that water, rather than air, was the likely cause of disease transmission.

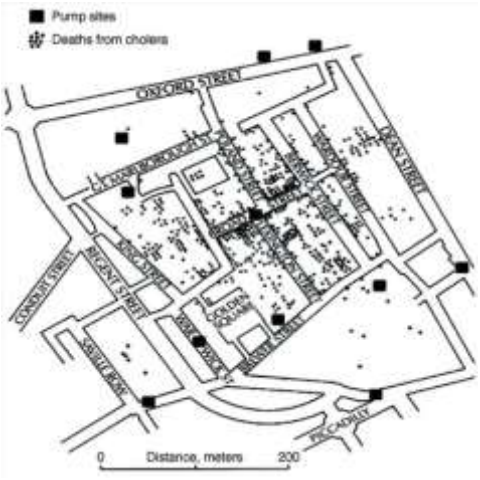
John Snow

John Snow was a pioneer in surgery as well as in public health, improving medical methods and using detailed evidence to challenge old theories. In 1849 he published a book saying that cholera spread through water, not in 'bad air', but his suggestion was mocked by many doctors. In 1854 another cholera outbreak gave him the chance to prove his theory that people caught cholera from water they used for washing and drinking.

Cholera killed over 500 people around Broad Street, near Snow's surgery, in just ten days. This led Snow to map out the deaths in detail and write a report detailing his evidence: 'On the Mode of Communication of Cholera'.

Snow's evidence was so strong that the handle of the Broad Street water pump was taken away, stopping people getting water from the pump. There were no more deaths. It was later discovered that a cesspool, only a metre away from the pump, was leaking into the drinking water.

Snow had proved that clean water was essential for preventing the spread of cholera but even this did not lead to a new Public Health Act enforcing change. Many scientists still clung to the 'bad air' theory (Pasteur had not yet published his germ theory).



The Great Stink

By 1858, thousands of new WCs all over London were flushing waste into the River Thames. The summer of 1858 was hot, very hot. There was no rain to fill the rivers, and river levels fell, especially the Thames in London. As a result the smell from the river grew worse and worse.

"Gentility of speech is at an end - it stinks; and whoso once inhales the stink can never forget it and can count himself lucky if he lives to remember it". *City Press* newspaper.

One of the very worst places was at the Houses of Parliament, which are right on the river bank. Sheets soaked in chloride of lime were hung from windows to try to blot out the smell, and plans were made to move the House out of London.

The Thames was also used for drinking water and thousands died from cholera, typhoid and other water-borne diseases, although it was thought these came from the foul air in what was called a "miasma".

Years before the Great Stink, the Commons had passed legislation to build a new sewerage system to clean up the Thames, but this had just led to endless wrangles and infighting. Some 137 schemes were proposed and all were turned down.

The Great Stink changed all that. "Parliament was all but compelled to legislate upon the great London nuisance by the force of sheer stench," *The Times* thundered. A new law was passed in 18 days to get a new sewerage system, a phenomenal undertaking costed at £3million. Reassuringly, even then it ended up over budget, at

£20 million - around £1.5 billion in today's money - dwarfing Brunel's Great Western Railway, which cost only £8 million.

However, these improvements were confined to London and there was no new Public Health Act to enforce improvements throughout the country.

So why was conservatism finally defeated?

In 1861 Pasteur published his germ theory. In 1864 he conducted a series of public experiments that convinced most scientists that diseases were caused by bacteria. This finally provided the clear proof that was needed of the link between dirt and disease and showed that Chadwick, Farr and Snow had all been correct in their arguments.

For years governments had been unwilling to make public health reform compulsory. The only voters in general elections were wealthy land-owners and the well-off middle classes, the very people who would have to pay more if the public health reforms became compulsory. Governments did not want to offend these men and risk losing their votes in an election.

All was changed by the 1867 Reform Act. The 1867 Reform Act was the second major attempt to reform Britain's electoral process – the first being the 1832 Reform Act. The 1867 Reform Act is properly titled the Representation of the People Act 1867.

There had been moves towards electoral reform in the early 1860s via Lord John Russell. However, his attempts were thwarted by Britain's most powerful politician of the time – Lord Palmerston who was against any form of change.

The death of Palmerston in 1865 gave Russell the opportunity he needed, as he became Prime Minister. Russell wanted to give the vote to "respectable working men" but would have excluded unskilled workers and the poor. To this end, the middle classes would still have had the major clout in an election.
Russell's bill split the Liberal Party. There were those who favoured his bill as the right move ahead. But there were some Liberals – the Adullamites – who were more conservative and sided with the Conservative Party to defeat the bill. Parliament's lack of enthusiasm for change led to Russell's resignation in June 1866.

Russell was replaced as the leader of the Liberal Party by William Gladstone, who made it clear that he favoured extending the franchise.

The new Prime Minister was Lord Derby, a Conservative. His Chancellor of the Exchequer was Benjamin Disraeli. Ironically Gladstone was supported by Disraeli in his desire to extend the franchise. Disraeli was concerned that the Conservative Party might be seen as a party that did not favour reform. He feared that the accolade that would be associated with reform might go to the Liberal Party. If the Conservative Party introduced said reform, they would get the credit for it, so Disraeli believed.

In an effort to out-Gladstone Gladstone, the Conservatives introduced a bill that was more far-reaching that many politicians had expected. Russell's desire to enfranchise the "respectable working men" was expanded to effectively include most men who lived in urban areas. Disraeli believed that the newly enfranchised men would thank the Conservatives for their new found political status and would vote for the party. In this he was correct, as the Conservatives won the 1874 election – though whether this was solely due to the new voters expressing their thanks to the Conservatives is doubtful.

The 1867 Reform Act enfranchised 1,500,000 men. All male urban householders and male lodgers paying £10 rent a year for unfurnished accommodation got the right to vote. The Act all but doubled the electorate. 52 seats were redistributed from small towns (less than a population of 10,000 such as Chichester, Harwich and Windsor) to the growing industrial towns or counties. Birmingham, Leeds, Liverpool and Manchester saw their representation increase from 2 MPs to 3 MPs. The University of London was also given a seat. The counties of Cheshire, Kent, Norfolk, Somerset, Staffordshire and Surrey were all given 6 MPs instead of 4.

In 1868, Scotland was given seven new MPs, as some new constituencies were created or existing constituencies were expanded. The representation in Ireland remained the same.

The Public Health Act 1875

The Public Health Act 1875 was passed for a number of reasons, not least the 1867 Reform Act. Now that so many working men had the vote, politicians had to ensure that their policies appealed to these new voters. What working men wanted were better living and working conditions, and a big part of that involved improving public health. It was not just the increased working class vote that led to the move away

from the government's previous laissez-faire attitude towards the issue of public health. Yet another cholera outbreak in 1866, along with the clear failure of the Public Health Act 1848 to noticeably improve conditions, both led the government to take greater control over public health. Also, Louis Pasteur's discovery that germs cause disease meant that there was now proof that it was unhygienic living conditions that led to the bad health of the poor.

The Public Health Act 1875 brought together a range of Acts covering sewerage and drains, water supply, housing and disease. Local authorities had to appoint Medical Officers in charge of public health. Local sanitary inspectors were appointed to look after slaughterhouses and prevent contaminated food being sold. Local authorities were ordered to cover sewers, keep them in good condition, supply fresh water to their citizens, collect rubbish and provide street lighting.

The major difference between the Public Health Acts of 1848 and 1875 was that the Public Health Act 1875 was **compulsory**. This meant that it was much more effective than the 1848 Act at improving public health. The government's powers to improve the towns and cities had grown since the last Act and now the government had unbelievable power over what went on in these areas health-wise. With these powers the government laid sewers and drains, built reservoirs, parks, swimming pools and other public conveniences. The larger cities had to look far away to get their fresh water supplies, so Manchester set up a reservoir in the Lake District. Liverpool created a reservoir in Wales and by 1881 almost everywhere had a fresh water supply.

<u>Sewers</u>

Passing a law saying public health reform was compulsory was only the beginning. After that came the hard engineering work, building the new systems. This used engineering knowledge that had not been available a hundred years earlier, but there had been great improvements in technology during the Industrial Revolution and the building of the railways. This knowledge was essential to make the laws effective.

Joseph Bazalgette was the engineer who designed and built London's sewer system after the Great Stink of 1858. He spent his early career in the railway industry, gaining experience of large engineering projects. After 1858 he planned and organised the building of London's sewer system, the same system that is still used today. This system included:

- 83 miles of main sewers, built underground from brick
- 1100 miles of sewers for each street and connecting to the main sewers

- a series of major pumping stations to drive the flow of sewage along the pipes.

The core of the work was completed by 1865 but it was such a huge project it took another ten years to complete. Fortunately, Bazalgette looked ahead and forecast the growth of population so made sure the system had a much higher capacity than was needed in the 1860s.

Lavatories

An invention that also made a difference was the flushing lavatory. Instead of privies needing to be emptied by hand and spade (and left rotting for days or weeks) the flushing system sent the waste instantly down into the sewer network. Of course at first such lavatories were only available to the rich but it was the beginning of a very important change.

Soap

Today a bar of soap is a very ordinary thing, but it was much rarer in the mid-1800s, partly because it was taxed and so it was too expensive for many people to buy. In 1853 the tax was taken off soap so many more people could afford it and so washing did more to kill germs, even if they did not know it then.

The Artisans' and Labourers' Dwellings Improvement Act 1875

The Artisans' and Labourers' Dwellings Improvement Act 1875 was designed by Richard Cross, Home Secretary during Prime Minister Benjamin Disraeli's second Conservative government, which involved allowing local councils to buy up areas of slum dwellings in order to clear and then rebuild them. It formed part of Disraeli's social reform initiative aimed at the 'elevation of the people' (the working class). Also, key individuals, such as the philanthropist Octavia Hill, helped pressurise the government into passing the Act.

The key terms of the Act were:

1. Compel owners of slum dwelling to sell to councils, who must provide compensation.
2. Take advantage of lower than normal interest rates from the Government.
3. Demolish the areas of slum housing to be redeveloped by commercial builders.

However, councils were not compelled to take action and, due to the obvious cost involved, few did. In fact, by 1881 only 10 out of 87 towns in England and Wales used their permitted powers. The most notable major redevelopment occurred in Birmingham under the prominent Radical Liberal Member of Parliament, Joseph Chamberlain. There, it led to the creation of Corporation Street, a main shopping street in the centre of Birmingham. Overall however, the Act proved ineffective.

The Rivers (Pollution Prevention) Act 1876

The first Act of Parliament to attempt to control water pollution was the Rivers (Pollution Prevention) Act 1876. Although there had been previous Acts which had dealt with water pollution, they were primarily aimed at improving public health or the productivity of fishing. The Rivers (Pollution Prevention) Act 1876 created several offences in relation to the discharge and dumping of sewage or industrial waste into rivers. The Act also stated that a company would have to prove that they had used the 'best practicable means' to render any possible pollutants harmless. Despite the creation of these offences, the Act was considered ineffective.

The Sale of Food and Drugs Act 1875

In the 1850s, there was increasing concern on the issues of food purity and food adulteration based on the identification of such issues by analysts and medical doctors. This led to the adoption of three separate pieces of legislation addressing food adulteration; one such was the Adulteration of Food and Drugs Act 1860. However, this was ineffective, but it paved the way for the enactment of the Sale of Food and Drugs Act 1875. The main requirements of the 1875 Act were:

- that nothing should be added to food for sale that would be injurious to health
- that sale of food that was not of the proper nature, substance or quality was prohibited
- that [public] analysts be appointed
- that purchasers of a food were entitled to have it analysed
- that the officers entitled to obtain samples for submission to an analyst were specified.

Although it was not without its critics, this Act remained in force in various forms for the next 60 years.

Joseph Chamberlain

Joseph Chamberlain (8 July 1836 – 2 July 1914) was a British politician and statesman. He was best known as the leading imperialist of the day in Britain, first in the radical wing of the Liberal Party, then in the Liberal Unionist alliance partner of the Conservative Party.

In November 1873, the Liberal Party swept the municipal elections and Chamberlain was elected mayor of Birmingham. As mayor, Chamberlain promoted many civic improvements, leaving the town 'parked, paved, assized, marketed, gas & watered and *improved*'. Prior to his tenure in office, the city's municipal administration was notably lax with regards to public works, and many urban dwellers lived in conditions of great poverty.

The Birmingham Gas Company and the Birmingham and Staffordshire Gas Company were locked in constant competition, in which the city's streets were continually dug up to lay mains. Chamberlain forcibly purchased the two companies on behalf of the borough for £1,953,050, even offering to purchase the companies himself if the ratepayers refused. In its first year of operations the new municipal gas scheme made a profit of £34,000.

The city's water supply was considered a danger to public health – approximately half of the city's population was dependent on well water, much of which was polluted by sewage. Piped water was only supplied three days per week, compelling the use of well water and water carts for the rest of the week. Deploring the rising death rate from contagious diseases in the poorest parts of the city, in January 1876 Chamberlain forcibly purchased Birmingham's waterworks for a combined sum of £1,350,000, creating Birmingham Corporation Water Department, having declared to a House of Commons Committee that 'We have not the slightest intention of making profit...We shall get our profit indirectly in the comfort of the town and in the health of the inhabitants'. Despite this noticeable executive action, Chamberlain was mistrustful of central authority and bureaucracy, preferring to give local communities the responsibility to act on their own initiative.

In July 1875, Chamberlain tabled an improvement plan involving slum clearance in Birmingham's city centre. Chamberlain had been consulted by the Home Secretary, Richard Assheton Cross during the preparation of the Artisan's and Labourers' Dwellings Improvement Act 1875, during Disraeli's social improvement programme. Chamberlain bought 50 acres (200,000 m^2) of property to build a new

road, (Corporation Street), through Birmingham's overcrowded slums. Over-riding the protests of local landlords and the Commissioner of the Local Government Board's inquiry into the scheme, Chamberlain gained the endorsement of the President of the Local Government Board, George Sclater-Booth. Chamberlain raised the funds for the programme, contributing £10,000 himself. However, the Improvement Committee concluded that it would be too expensive to transfer slum-dwellers to municipally built accommodation, and so the land was leased as a business proposition on a 75-year lease. Slum dwellers were eventually rehoused in the suburbs and the scheme cost local government £300,000. The death-rate in Corporation Street decreased dramatically – from approximately 53 per 1,000 between 1873 and 1875 to 21 per 1,000 between 1879 and 1881.

During Chamberlain's tenure of office public and private money was used to construct libraries, municipal swimming pools and schools. The Birmingham Museum & Art Gallery was enlarged and a number of new parks were opened. Construction of the Council House was begun while the Victoria Law Courts were built on Corporation Street.

Model villages

During the 19th and early 20th centuries, villages were constructed by English industrialists and landowners to provide housing close to factories or estates for the workers and their families. One of the most well known is Saltaire in West Yorkshire, which was built in the early 1850s and named after mill owner Sir Titus Salt and the river Aire which flows through the area.

Most of those who built model villages are credited with being philanthropists who were genuinely concerned for the welfare of their workers, moving them from generally grim living conditions to affordable modern cottages in planned communities with shops, schools, recreation and other amenities.

Detractors counter this with the belief that industrialists were only looking to maximize profits, with happy workers generally being more productive. Improving their housing could therefore be seen as an essential contribution to increasing the success of the business. In some cases the creators of model villages were also looking to impose a significant amount of control over their employees, dictating what they could and couldn't do in these new communities designed to strictly follow their own beliefs.

Salt moved his five woollen mills out of Bradford in order to be able to provide better housing than was available in the city. Around 850 small stone houses line

the narrow streets, which were named after Salt's family, the royal family and architects who helped plan the town. Saltaire also had a number of almshouses – residences for those too poor to be able to afford their own house.

The town had a hospital, a school, allotments and other civic services. The Saltaire Institute (now Victoria Hall) provided a library, meeting rooms, a gym and other recreational facilities. The iconic stone lions at the corner of the property represent War and Peace.

There was also a dining room where hundreds of mill workers ate affordable meals every day. However, because Salt was a Quaker who believed in temperance, he would not allow pubs to be built in his town.

A friend of Titus Salt, Edward Akroyd, built two other nearby model villages for his mills – Akroydon and Copley. He also added a financing scheme which allowed workers to eventually own their houses, rather than just renting them.

Members of the Cadbury chocolate-maker family were also Quakers; they built the model village of Bournville near Birmingham after they had moved the business out of the city to allow for growth. Eventually, a dark chocolate bar was named after the village.

From the late 19th century onwards, the Cadburys built almshouses, a meeting house and hundreds of cottages. The new community also included spacious parkland and sports and leisure facilities, and like Saltaire, there were no pubs. The Cadburys were also known for paying good wages, starting pension plans and providing medical services to their workers.

Grateful residents built the Bournville Rest House to mark George Cadbury's silver wedding anniversary. Today the village – now numbering thousands of households – is controlled by a trust independent from Cadbury, but which tries to maintain the historic goals of the community.

Port Sunlight was built in the early 20th century by the Lever Brothers, and named after their most popular detergent. It remained exclusively populated by employees until the 1980s. The 800 houses were designed by many different architects, with wildly varying styles placed next to each other. The community had many of the same facilities as the villages above – parks, schools, a hospital and sports facilities. William Lever was a noted collector of art and built the Lady Lever Art Gallery to show off his collection.

Charles Booth

Charles Booth, the son of a wealthy businessman, was born in Liverpool on 30th March, 1840. Booth's father was a Unitarian and head of the Lamport & Holt Steamship Company. When Booth was twenty two his father died and Booth took over the running of the company. Booth was an energetic leader and soon added a successful glove manufacturing concern to his expanding shipping interests.

In 1885 Charles Booth became angry about the claim made by H. H. Hyndman, the leader of the Social Democratic Federation, that 25% of the population of London lived in abject poverty. Bored with running his successful business, Booth decided to investigate the incidence of pauperism in the East End of the city. To this end, he recruited a team of researchers.

The result of Booth's investigations, *Labour and Life of the People*, was published in 1889. Booth's book revealed that the situation was even worse than that suggested by H. H. Hyndman. Booth's research suggested that 35%, rather than 25%, were living in abject poverty. Booth now decided to expand his research to cover the rest of London. He continued to run his business during the day and confined his writing to evenings and weekends. In an effort to obtain a comprehensive and reliable survey, Booth and his small team of researchers made at least two visits to every street in the city.

Over a twelve year period (1891 to 1903) Booth published 17 volumes of *Life and Labour of the People of London*. In these books, Booth argued that the government should assume responsibility for those living in poverty. One of the proposals he made was for the introduction of old age pensions, a measure that he described as 'limited socialism'. Booth believed that if the government failed to take action, Britain was in danger of experiencing a socialist revolution.

Seebohm Rowntree

Benjamin Seebohm Rowntree was born in York on 7th July, 1871. He was the third child of Joseph Rowntree and Emma Seebohm. He was educated at the York Quaker Boarding School and Owen College, Manchester.

In 1897 Rowntree was appointed as a director of his father's successful business in York. Like his father, Seebohm believed it was his duty to help the poor and disadvantaged. On Sundays he taught at the York Adult School. He also visited the homes of his students and obtained first-hand knowledge of their problems.

In the 1860s, Joseph Rowntree had carried out two major surveys into poverty in Britain. Inspired by his father's work and the study by Charles Booth, *Life and Labour of the People in London* (1889), Seebohm Rowntree decided to carry out his own investigations into poverty in York. Rowntree spent two years on the project and the results of his study, *Poverty, A Study of Town Life*, was published in 1901.

In his study, Rowntree distinguished between families suffering from primary and secondary poverty. Primary poverty, he argued, was where the family lacked the earnings sufficient to obtain even the minimum necessities, whereas families suffering from secondary poverty, had earnings that were sufficient, but were spending some of that money on other things. Whereas some of these were 'useful', others, like spending on alcohol, were 'wasteful'.

Rowntree's study provided a wealth of statistical data on wages, hours of work, nutritional needs, food consumed, health and housing. The book illustrated the failings of the capitalist system and argued that new measures were needed to overcome the problems of unemployment, old age and ill health.

Rowntree, a strong supporter of the Liberal Party, hoped that the conclusions that he had drawn from his study would be adopted as party policy. David Lloyd George, President of the Board of Trade, met Rowntree in 1907 and the two became close friends. The following year Lloyd George became Chancellor of the Exchequer and introduced a series of reforms influenced by Rowntree, including the Old Age Pensions Act (1908) and the National Insurance Act (1911).

David Lloyd George asked Rowntree to carry out a study of rural conditions in Britain. His report, *The Land*, published in 1913, argued that an increase in small landholdings would make agriculture more efficient and productive. In 1913 Rowntree also published *How the Labourer Lives*, a detailed study of fifty two farming families.

Seebohm Rowntree believed that healthy and well-fed workers were also efficient workers. Working closely with his father, Joseph Rowntree, Seebohm introduced a

series of reforms at his own company. One change was an increase in wages for the 4,000 people the company employed. Seebohm argued that employers who refused to pay decent wages should be put out of business, as their existence was bad for the "nation's economy and humanity".

Workhouses

Conditions during the early 19th century meant the government was forced to reassess the way it helped the most impoverished members of society. The return of unemployed or injured servicemen from the Napoleonic Wars saw the national poor relief bill quadruple between 1795 and 1815, rising from £2 million to £8 million. To make matters worse, new Corn Laws restricted grain imports and pushed up the cost of bread.

The government's response was to pass a Poor Law Amendment Act in 1834, based on the recommendation of a royal commission. The new system was still funded by rate payers, but was now administered by unions – groupings of parishes – presided over by a locally elected Board of Guardians. Each union was responsible for providing a central workhouse for its member parishes. For the able-bodied poor, it was the workhouse or nothing.

Entering the workhouse was not simply a matter of turning up at the gate. The poor would first meet with a relieving officer, who toured the union on a regular basis. In most cases they would be 'offered the house' and given a ticket of admission. The family would then make its way to the workhouse, where their clothes were put into storage, and they would be issued with a uniform, given a bath and be subjected to a medical examination.

Men and women were separated, as were the able-bodied and infirm. Those who were able to work did so for their bed and board. Women took on domestic chores such as cooking, laundry and sewing, while men performed physical labour, usually stone breaking, oakum picking or bone crushing. Conditions were basic: parents and children were permitted to meet briefly on a daily basis, or on Sundays. Inmates ate simple fare in a large communal dining hall, and were compelled to take regular, supervised baths.

Until 1860, medical provision in the workhouses was often dire, with nursing duties generally performed by elderly female inmates, many of whom could not read, were hard of hearing, visually impaired, and fond of a drink. Medical wards were frequently cramped and poorly ventilated but, following a sustained campaign led by the medical profession during the 1860s, the government passed the Metropolitan Poor Act, forcing London's workhouses to run separate infirmaries, preferably on separate sites. Meanwhile, the Metropolitan Asylums Board (established in 1867)

provided care for fever cases that would ordinarily have ended up in the infirmaries. By the 1880s, the unions widely employed trained nurses, and the poor could increasingly visit workhouse infirmaries for treatment without having to formally enter the institution.

Historians are still debating when exactly the workhouse system came to an end. Some date its demise to 1930, when the Board of Guardians system was abolished and many workhouses were redesignated as Public Assistance Institutions, becoming the responsibility of local councils. Others date it to 1948 and the introduction of the National Health Service, when many former workhouse buildings were turned into public hospitals, many of which still survive today.

The Boer War

One motive for reform was the poor physical condition of recruits for the Boer War that brought the scale of poverty unearthed by Booth and Rowntree to the surface, and showed the failure of a laissez-faire non-interventionist state.

The Boer War at the end of the nineteenth century sent warnings that Britain's imperial supremacy could be in danger of disintegrating due to the poor physical condition of a large number of recruits who were deemed unfit for service. Without this, the horrors of poverty that an industrialised non–interventionist state had created, it would have been unlikely that reform would have played such a major role in Liberal politics of the years 1906–1914.

In 1899 war had broken out between the powerful British Empire and the Boer Republics in South Africa. The Boers were descended from Dutch settlers who had become farmers. The British thought that the war would be over quickly, but Boer forces proved to be well trained and well led. The war dragged on for three years. Eventually, Britain used 400,000 troops to defeat Boer forces that never totalled more than 35,000 in the field. The war was a great shock to British confidence. In Britain, people searched for answers as to why it had taken three years for professional soldiers to defeat a force of Boer farmers. Details emerged from army recruiting centres which suggested that a high proportion of volunteers had been rejected as being unfit for service.

When the Boer War started in 1899 the army had needed to expand rapidly and volunteers rushed to join up. Initial ideas suggested that at least 25% of recruits were unfit for service. Hyndeman, the Marxist Social Democrat, claimed that the figure could be as high as 50% in urban areas. The public conscience was shocked by the fact that so many of these recruits failed to meet the army's standards of height, weight and

eyesight, a rejection rate of about 1 in 3. In Manchester 8,000 out of the 11,000 men who volunteered for the army had to be rejected as physically unsuitable at once; only 1200 were eventually accepted. In 1903 Major General Sir Frederick Maurice claimed that only two out of five enlisted men remained fit for service after two years. This, he stressed, was not a reflection on the hardships of army life, but on the level of unfitness within the population.

If men of military age were so unfit for service, the government worried about Britain's future ability to defend itself against a stronger enemy, especially an increasingly militaristic Germany who was after their own 'place in the sun.' Thus, the Boer War statistics caused great concern and prompted many people to support reform out of patriotism. If Britain was to remain a powerful military force in the world, then the health of its children had to be improved.

Importantly, the Boer War was further evidence that Britain was not doing enough to help the poorer in society. The importance of the Boer War is huge according to the historian Eric Evans:
"Arguably, the single most important precondition for the spate of social reforms between 1905 and 1914 was the fear of the consequences of an unfit and debilitated population."

As a result, the government set up the Inter-departmental Committee on Physical Deterioration, which published its findings in 1904. It made several suggestions, including an improvement in the standard of food and drink, regulations on overcrowding and air pollution, training of schoolgirls in cookery and hygiene, attention to infant welfare, the provision of meals for underfed children and the medical inspection of all children.

This implied an unfit workforce as well as an unfit army. No wonder the British Army performed so badly in South Africa and other countries were overtaking Britain in economic growth. Many people at the time blamed the conditions in Britain's towns for producing an unfit population.

Britain vs. Germany

Towards the end of the 19th century, concerns were increasingly expressed regarding the 'efficiency' of the British population. In the middle of the 19th century, Britain was clearly the world's foremost economic power and if it was to remain so, its workforce would have to be at least as fit as its competitors.

Britain had lost its position as the predominant industrial power and was facing serious competition from new industrial nations, such as Germany, leading to a fear that if the workforce was not operating at peak efficiency, Britain would fall further behind. The success of such foreign economies in catching up with Britain, and in some cases overtaking her, suggested that the British workforce was inferior to her rivals. This was reflected in concern at the slower growth of the economy and the relative decline in industrial production compared with Germany and the USA.

Equally, if Britain was not to fall further then the workforce would have to be at least as fit as that of her competitors. Advocates of national efficiency supported state intervention in the field of welfare. The idea of national efficiency became part of the language of the time and many found it reasonable to express their support for social measures in such terms. Social reform would make for a healthy population, which was more efficient as a workforce and as soldiers.

There was widespread concern about the 'physical deficiency'of the country's people and many argued that having so many unhealthy members of society was a waste of the country's resources in a period where it was under pressure from foreign competitors. Because of the higher fertility rates of the poor, it was feared that the 'national stock' would continue to deteriorate. Social action to improve the health and welfare of the disadvantaged was therefore in the national interest, by providing a people who could produce more and fight harder. In 1905 a group of experts reported '*No country can permanently hold its own in the race of international competition if hampered by an increasing load of this dead weight of poverty.'*

This linked in to national security, as Britain was engaged in a naval race with Germany, while France and Russia were also building new Dreadnoughts. If Britain could not build ships as fast as the opposition, the country would soon become vulnerable to attack. Also, the growth of highly mobile European armies was dependent on the transport and armaments industry.

Politicians such as Joseph Chamberlain and Lord Rosebery expressed this concern. It was argued that national efficiency and imperial strength required a better educated and healthier population.

Finally, the ideas of national efficiency came to affect the government itself. There was feeling that it was run by amateurs, who were incompetent in the fields of administration and incapable of generating social policy. The Treasury, where conservative thinking kept a tight rein on the purse strings, also received criticism for not supporting new interventionist ideas. It was suggested that more experts and businessmen become involved in government to streamline the system and make it more efficient. It also suggested military training for all men.

It was believed that if the health and educational standards of Britain's workers got worse, then Britain's position as a strong industrial power would be further threatened. With the mishaps of the Boer War and a decline in the British economy and industry (taken over by Germany and America) it was clear that Britain was weak compared to its European neighbour, Germany.

Germany had emerged as an economic rival to Britain and, increasingly, was also being seen as a military rival. Should Britain have to fight them, it seemed that they might gain a disproportionate advantage through their state interventionist social policy. The alliance system which would bring Britain into the First World War was largely complete, the naval arms race had started and the fear that Germany might have an advantage in the health of its population also spurred the Government to look at a social welfare programme.

Bismarck, the German Chancellor, had introduced limited social reforms in Germany in the 1880s. This network of social insurance, the compulsory sickness and accident insurance, old age pensions and highly organised educational system were far in advance of anything Britain had to offer. If a main competitor could afford to do it, why could Britain not do likewise?

This point was not lost on Churchill when he said in a letter to Asquith in December 1908 *"There is a tremendous policy in social organisation. The need is urgent and the moment ripe. Germany, with a harder climate and far less accumulated wealth, has managed to establish tolerable basic conditions for her people. She is organised not only for war, but for peace. We are organised for nothing except party politics.'*

Therefore, questions had to be asked about how Germany had overtaken Britain economically, industrially and militarily. It became obvious that the Germans were more prosperous due to their commitment to 'national efficiency.' Britain, for all her 'personal liberty', boasted of nothing that could rival Germany's industrial, economic and military dominance and this provided politicians in Britain with evidence that state intervention had great benefits in formulating an efficient nation.

The resentment and fear from British statesmen, the need to secure Britain's imperial position, the need to re-establish a physically fit army for any future conflict, the need to produce young healthy children to breed national efficiency for future generations, the proof that they were being overshadowed by Germany industrially, economically and militarily by 1906 and the clear evidence from the German model to the benefits of adopting Bismarck's social policy were strong motives for the unusual burst of activity by the Liberal Government of 1906 – 1914.

The threat from the Labour Party

Although the Labour Party was still comparatively small in 1906, it did give cause for concern, as the growth of Labour showed that the working men felt that they needed special sectional representation within the political system. The 1906 election provided the Liberals with the chance to show that they were a party of concern and conscience which could legislate in the interest of the poor and that there was no need for a party designated to this one sole interest in society. The threat of Labour as a motive for reform in the early period of government is unimportant. However, the growing threat of Labour began to be felt from 1909 onwards, due to high unemployment caused by Britain entering a recession.

This led to great discontent among the masses, which is clear from the bad run of by-election results in 1907 and 1908, with both the Conservatives and Labour winning seats. A threat was therefore obvious to those politically astute politicians, such as David Lloyd George. It is therefore no coincidence, with growing discontent due to unemployment from the working class and the gain of seats in by-elections by Labour, that the most revolutionary Liberal reforms occurred before the 1910 election and after. The most important pre-election legislation was Winston Churchill's Labour Exchange Act, and Lloyd George's famous, 'Peoples Budget' of 1909, which taxed the rich for the poor.

Many historians believe that the Liberal reforms were passed for very selfish reasons. Since 1884, most working class men had the vote and the Liberals wanted to attract those votes. But by 1906 a new party-the Labour Party-was competing for the same votes. If the Liberals were seen as unsympathetic to the poor, what might happen at elections in the future? It was therefore to the political advantage of the Liberal government to offer social reform, even if they did not fully believe in the principle of government intervention.

Many historians see the Liberal social reforms as a response to the growth of socialism at the start of the twentieth century. In 1906, the Labour Party was founded to represent the working class in Parliament. The Labour Party was committed to a programme of social reforms, such as old age pensions. Twenty nine

Labour MPs were elected to Parliament in 1906. Many Liberals felt that Labour had the potential to replace them as the main alternative to the Conservatives. A Liberal programme of social reform could out-trump Labour and stop the working class defecting to them. There was also a deep concern that a more radical brand of socialism, committed to the destruction of the capitalist system, might arise if action was not taken to improve conditions for the working class.

By 1900, most working men had the vote. Workers now had some real power. They would obviously vote for the party which promised to improve their conditions. The Labour Movement was calling for old age pensions and for action against unemployment.

The Liberals therefore had to keep an eye on the Labour threat and so deal with social questions. Many Liberals regarded social reforms as an antidote to socialism. So the fear of socialism did play an important part in causing the Liberal reforms. One of the reasons Lloyd George and Winston Churchill pushed for limited state intervention was to draw support away from the Labour Party.

Between 1906 and 1914, the Liberals launched into one of the biggest programmes of social reform ever. Overall, the Liberals saw social reform as a way of heading off socialism. They hoped that a system that gave people a degree of social and economic independence would be an insurance against the spread of socialism.

'New Liberalism'

With opinion swaying towards state intervention and the emergence of the Labour Party, who were seen as the party of the working class, a change in the direction and ideology of Liberal policy had to be implemented. Thankfully, however, there was a change in direction in Liberal thinking at the beginning of the twentieth century, producing a group of charismatic men who fell under the term **'New Liberalism'**.

It would be far too harsh to argue that the Liberals passed social reforms just to win votes. A new generation of Liberal politicians genuinely believed that the government had a responsibility to help the poor. The 'old Liberal' Prime Minister Henry Campbell Bannerman died and was replaced by Herbert Asquith in 1908. New Liberals with new 'interventionist' ideas, such as David Lloyd-George, were given important government jobs. These appointments are the main reasons why so many reforms happened from 1908 onwards.

This left wing **'New Liberal'** group broke away from traditional Gladstonian (laissez-faire) ideology and included some of the most important politicians in twentieth

century history, such as Asquith, Lloyd George and Churchill. These men had a great awareness of social problems and the obvious failures of the Poor Law and philanthropy. They had personal desires to help those in poverty and to remove the stigma attached to the 1834 Poor Law, as this law only offered a solution to destitution, not to poverty. The personal motives of a group of politicians to relieve poverty cannot be disregarded in explaining the burst of reform from the Liberals between 1906 and 1914. Without a change in thinking, reform would not have played such a major role in Liberal policy, as the old doctrine of self-help would still have been the bedrock for social policy. However, the emergence of politicians who realised the inadequacies of a non-interventionist state and the problems that poverty brought to society, meant that these men with their position and personal motives to relieve poverty could make a difference in the direction of government social policy. Without the emergence of such an intellectual revolution in Britain, it would have been very unlikely that Britain would have had social policy implemented by the outbreak of the First World War in 1914, which helped create a more efficient nation for the onslaught of war.

Liberal Reforms for Children

Provision of School Meals Act 1906

Margaret McMillan and Fred Jowett were members of the School Board that introduced free school meals in Bradford. This was actually illegal and Bradford could have been forced to end this service. McMillan and Jowett tried to persuade Parliament to introduce legislation that encouraged all education authorities to provide meals for children. McMillan argued that if the state insisted on compulsory education, it must take responsibility for the proper nourishment of school children. A report published in 1889 indicated that over 50,000 pupils in London alone were attending school 'in want of food'.

The 1906 General Election elected a Liberal government committed to social reform. Fred Jowett, the Labour MP for Bradford, was elected to the House of Commons for the first time. Jowett's maiden speech was on the subject of school meals and he eventually managed to convince Parliament that hungry children had trouble learning. In 1906 the government passed the Provision of School Meals Act. This Act permitted local authorities to provide school meals. However, many local councils ignored this system, as it was not compulsory for them to provide the free meals and the cost to the council was far greater than was subsidised for. The provision of free school meals was made compulsory in 1914, in which year fourteen million meals per school day were served (compared with nine million per school day

in 1910), most of which were free. In 1912, half of all councils in Britain were offering the scheme.

Medical Inspections Act 1907

The government passed the Medical Inspections Act in 1907. This Act meant every elementary (primary) child was inspected for height, weight, bad teeth, sight and hearing problems, verminous conditions, rickets and so on. A letter would be sent home to parents advising them to obtain necessary treatment.

This Act ultimately improved lives, as the reports produced due to the inspections led to calls for a future welfare state.

However, the first report in Glasgow revealed that there were still problems, it emerged that between 80% and 90% of the children examined had defective teeth; that about 9% suffered from rickets and about 30% were verminous. It was found that 55% of children with defects had not had any form of treatment, while many others had not received the continuing treatment which they required. This meant that diagnosis, and not treatment, was given and since most parents could not afford treatment, problems went untreated, thereby their lives were not improved. However, in 1912 the government introduced school clinics, which provided children with much needed treatment, thereby improving their lives greatly.

School clinics 1912

School clinics were set up to treat children who had been diagnosed as having an illness during a School Medical under the 1907 scheme.

This helped close the gap left by the 1907 scheme, so more children received free medical care. These clinics only covered children of school age. Younger children and adults in the same family could still be suffering from the disease.

Liberal Reforms for the Elderly

The Pensions Act 1908

The Liberals sought to tackle the problem of poverty in old age. Many elderly people were at risk of poverty, as they were too old and frail to work and earn an income. In 1908 the Pensions Act was passed. This provided a state pension to the poorest old people over 70 if they met certain qualifications. If individuals met these qualifications they received up to 5 shillings a year from the government. This was welcomed by many old people, and by 1914, 970,000 people a year were claiming a pension. However, studies by Charles Booth and Seebohm Rowntree had shown that the poverty line was 7 shillings a week, so it is clear that pensions were only meant to supplement previous savings. The problem was that many poor elderly people did not have previous savings, so were still living in poverty. The Act also cost the government a lot of money, which meant a rise in taxes, which was unpopular with the majority of the population. Overall the Pensions Act did improve the lives of some of the poorest elderly people, however it can be argued that the pension was not enough to live on by itself and therefore did not eliminate the problem of poverty in the elderly.

David Lloyd George and the 'People's Budget' of 1909/1910

After the 1906 General Election, the leader of the Liberal Party, Sir Henry Campbell-Bannerman, became the new Prime Minister. David Lloyd George was given the post of President of the Board of Trade. In 1908 the new Prime Minister, Herbert Asquith, promoted him to the post of Chancellor of the Exchequer. Lloyd George now had the opportunity to introduce reforms that he had been campaigning for since he first arrived in the House of Commons.

Lloyd George had been a long opponent of the Poor Law in Britain. He was determined to take action that in his words would "lift the shadow of the workhouse from the homes of the poor". He believed the best way of doing this was to guarantee an income to people who were too old to work. Based on the ideas of Tom Paine that first appeared in his book *Rights of Man* in 1791, Lloyd George's measure, the Old Age Pensions Act, provided between 1s. and 5s. a week to people over seventy.

To pay for these pensions, Lloyd George had to raise government revenues by an additional £16 million a year. In 1909, Lloyd George announced what became known as the 'People's Budget'. This included increases in taxation. Whereas people on

lower incomes were to pay 9d. in the pound, those on annual incomes of over £3,000 had to pay 1s. 2d. in the pound. Lloyd George also introduced a new super tax of 6d. in the pound for those earning £5000 a year. Other measures included an increase in death duties on the estates of the rich and heavy taxes on profits gained from the ownership and sale of property. Other innovations in Lloyd George's budget included labour exchanges and a children's allowance on income tax.

Ramsay MacDonald argued that the Labour Party should fully support the budget. "Mr. Lloyd George's Budget, classified property into individual and social, incomes into earned and unearned, and follows more closely the theoretical contentions of Socialism and sound economics than any previous Budget has done."

The Conservatives, who had a large majority in the House of Lords, objected to this attempt to redistribute wealth, and made it clear that they intended to block these proposals. Lloyd George reacted by touring the country making speeches in working-class areas on behalf of the budget and portraying the nobility as men who were using their privileged position to stop the poor from receiving their old age pensions. After a long struggle with the House of Lords, Lloyd George finally got his budget through parliament.

Liberal Reforms for the Unemployed

Winston Churchill and The Labour Exchanges Act 1906

In the 1900 General Election Winston Churchill was elected as the Conservative MP for Oldham. As a result of reading *Poverty, A Study of Town Life* by Seebohm Rowntree he became a supporter of social reform. In 1904, unconvinced by his party leader's desire for change, Churchill decided to join the Liberal Party.

In the 1906 General Election, Winston Churchill won North West Manchester and immediately became a member of the new Liberal government as Under-Secretary of State for the Colonies. When Herbert Asquith replaced Henry Campbell-Bannerman as Prime Minister in 1908, he promoted Churchill to his cabinet as President of the Board of Trade. While in this post, Churchill carried through important social legislation, including the establishment of labour exchanges.

In 1908 the Labour Exchanges Act was passed. This set up labour exchanges, which advertised vacancies and were similar to the Job Centres of today. They were shown to be a success, as in 1912 they helped over 560,000 workers find work. However, they had some flaws. Employers were not required to inform the centres of vacancies and most of the jobs advertised only offered temporary employment, so the exchanges did little to tackle the problem of long term unemployment.

On 12th September 1908, Winston Churchill married Clementine Ogilvy Spencer and the following year published a book on his political philosophy, *Liberalism and the Social Problem* (1909).

Following the 1910 General Election, Winston Churchill became Home Secretary. Churchill introduced several reforms to the prison system, including the provision of lectures and concerts for prisoners and the setting up of special after-care associations to help convicts after they had served their sentence. However, Churchill was severely criticized for using troops to maintain order during a Welsh miners' strike.

Liberal Reforms for Sick Workers

The National Insurance Act 1911

The Liberals sought to help workers who were at risk of falling into poverty due to sickness. If workers were too ill to work, they were unable to earn a living to support themselves and their families. In 1911, the National Insurance Act (Part 1) was passed. This provided sickness benefits funded by contributions from the employee, the employer and the government. It was successful to an extent, as if a worker was off sick, they received 10 shillings a week for up to 26 weeks. The Act also provided free medical inspections and basic treatment for the worker. However, it did not provide medical care for the worker's family, and it did not provide specialist services, such as dental care and hospital treatment. It did not attempt to establish a national system of healthcare to meet the needs of the wider population. Overall, the National Insurance Act (Part 1) was successful in that it provided financial assistance to help workers who suffered from temporary sickness, but it was limited as it only provided direct help for 'breadwinners' and did nothing to deal with wider health issues among the British people.

The 1911 National Insurance Act (Part 2) tried to tackle the problem of poverty caused by unemployment. Insured workers were entitled to 7 shillings a week for up to 15 weeks. However, only 7 trades which suffered from seasonal unemployment were covered, including shipbuilding, construction and engineering. Therefore, the reforms passed to tackle the problem of poverty due to unemployment did help many workers who found themselves temporarily unemployed, but did not eliminate the problem of poverty, as the Acts failed to prevent long term unemployment.