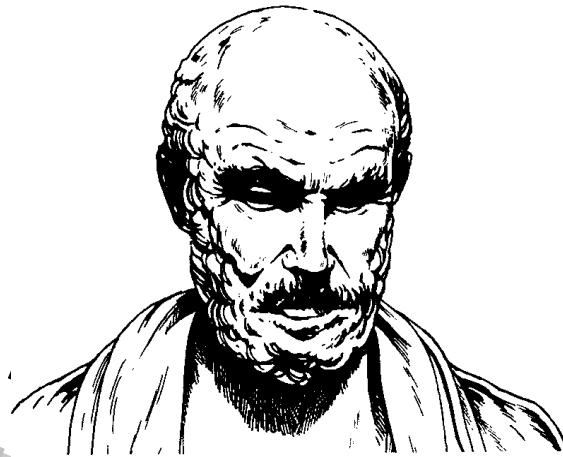
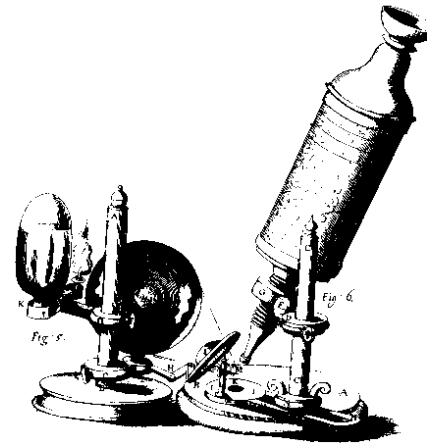
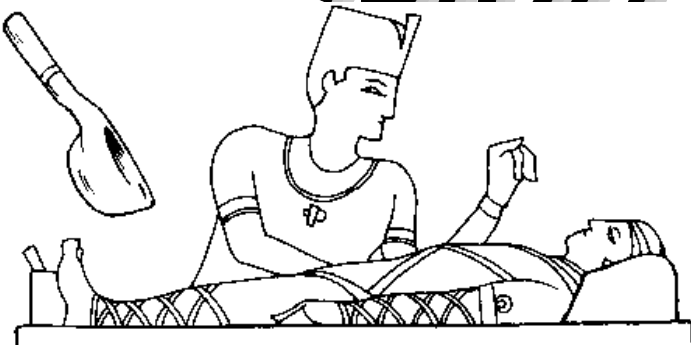
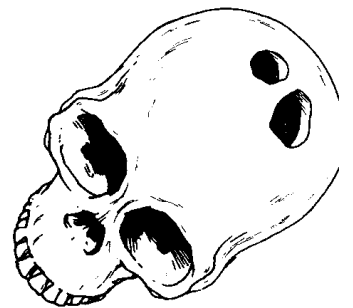


AR

REVISION



REVISION BOOKS



PREHISTORY

Before 3000BC

SUMMARY

- ❖ Very little evidence remains. Some skulls and cave paintings have survived
- ❖ Comparisons can be made with present day primitive societies e.g. aboriginal life
- ❖ Lived as nomads - hunter gatherers
- ❖ No written language
- ❖ Supernatural causes for unexplained events would have discouraged investigation or experimentation so **medical development would have been slow**

CAUSE & CURE

‘A mixture of supernatural & natural’

- ❖ Supernatural belief that spirits caused disease meant supernatural cures were often used. Also simple remedies from herbs.

Causes

- ❖ Belief that illness was caused by evil spirits
- ❖ Broken bones and cuts



Cures

- ❖ Plants, roots and berries used to make medicines
- ❖ Possible that rough mud and clay casts were used to set broken bones
- ❖ People believed that evil spirits had to be driven out by magic, chants and charms
- ❖ Trephining was used to release evil spirits

ANATOMY & SURGERY

- ❖ Trephining / trepanning to let out evil spirits. Re-growth of bones suggests that some survived the operation.
- ❖ Simple surgery such as encasing arms or legs in clay to repair broken bones.
- ❖ Possible that trances were used as an anaesthetic.



PUBLIC HEALTH & WELFARE

- ❖ We know very little about public health in prehistoric medicine.
- ❖ Not needed as there were no towns or large groups.
- ❖ Fear of curses may have led them to bury human waste.

SUPERSTITION & RELIGION

- ❖ Very strong influence - believed spirits caused/cured illnesses.
- ❖ Used prayers, charms, spells etc.

COMMUNICATION

- ❖ No written language so ideas only passed on slowly by word of mouth.
- ❖ Lack of communication hindered development of medicine

TECHNOLOGY

- ❖ Used stone or bone tools e.g. to do trepanning of skulls.

CHANCE

- ❖ Most remedies were probably discovered by luck or instinct.

INDIVIDUALS

- ❖ Medicine men were powerful and important members of the tribe. They would deal with the "evil spirits"
- ❖ Women had learned from their mothers how to take care of the family.



ANCIENT EGYPT



3000BC-400BC

SUMMARY

- ❖ Settled to live around the river Nile, they grew crops and reared animals rather than live as hunter-gatherers. This had a big impact on medicine.
- ❖ They still believed in the power of spirits and gods but they also started to try to understand and to control the world.
- ❖ They developed a form of writing this meant they could pass knowledge on.
- ❖ Dried remains of drugs, wall paintings & inscriptions in and on clay tablets and papyrus provide an insight into medicine during this time.
- ❖ Successful agriculture provided spare food so that more people could be doctors & priests etc.
- ❖ By trading widely they found new spices that could be used to treat disease.
- ❖ Some progress during this time
 - specialist doctors
 - writing
 - new plants

CAUSE & CURE.

‘A mixture of supernatural & natural’

Causes

- ❖ Believed the Gods controlled all aspects of life e.g. Imphotep was the god of healing.
- ❖ Believed that illness was caused by evil spirits entering the body.
- ❖ A study of the river Nile led to the theory of blocked channels.

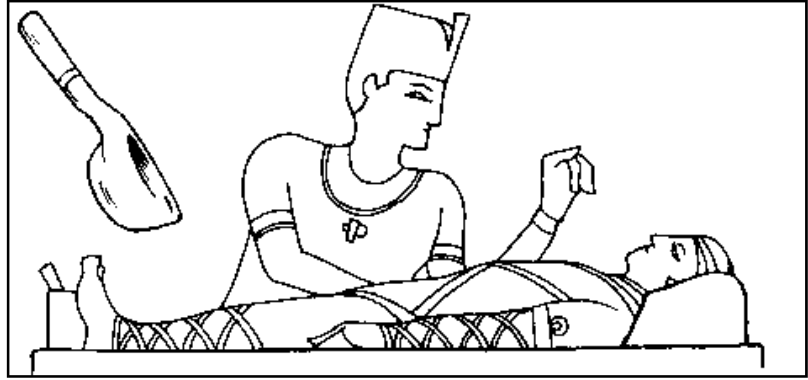
Cures

- ❖ Believed in the need to drive out evil spirits.
- ❖ Amulets, charms & rituals were used.
- ❖ Remedies were based on herbs, plants, minerals and animal parts.
- ❖ Unblock the channels of the body
 - vomiting
 - purging (laxatives)
 - bleeding

- ❖ Personal hygiene was important, they bathed, changed their clothes regularly and some shaved their heads.

ANATOMY & SURGERY

- ❖ Belief in an afterlife led to embalming. This provided them with some knowledge of the anatomy as soft internal organs were taken out of the body. However these organs were not examined as they believed disease was caused by spirits.
- ❖ Minor operations, e.g. the cutting away of tumours and eye surgery.
- ❖ Willow bark was used as an antiseptic



WAR

- ❖ Sekhmet was the goddess of war. They believed she caused and cured epidemics.
- ❖ War led to new treatments for wounds.

PUBLIC HEALTH & WELFARE

- ❖ No 'Public Health' systems were provided by the government.
- ❖ Rich people were keen on personal hygiene.
- ❖ Toilets have been found but no sewer system meant that they had to be emptied manually. Evidence of wells being built to provide fresh water for the pharaohs.
- ❖ Mosquito nets provided some protection from malaria

SUPERSTITION & RELIGION

- ❖ Believed Gods controlled all aspects of life.
- ❖ Belief in an afterlife led to embalming bodies this helped the development of medical knowledge **but.....**
- ❖ Belief in an afterlife meant dissection was forbidden.

COMMUNICATION

- ❖ They began to write their ideas down.
- ❖ Barges on the Nile helped ideas to be communicated to lots of people.
- ❖ Trade brought new plants and ideas.

TECHNOLOGY

- ❖ Specialist metal workers produced metal tools which could be used for embalming & simple surgery.

DOCTORS AND NURSING

- ❖ Records show there were trained doctors who were also priests.
- ❖ Imhotep was a doctor who was later worshipped as a god of healing.
- ❖ People could specialise and do particular jobs. Iry became a famous doctor.
- ❖ Rich people, e.g. Pharaoh and his court, had the best medicine.
- ❖ Women had learned from their mothers how to take care of the family.

ANCIENT GREECE

800BC-400BC

SUMMARY

- ❖ The Ancient Greeks were seafarers and travelled around the Mediterranean. They learnt from other cultures, especially the Egyptians.
- ❖ Like the Egyptians they had many gods. They believed these controlled the world.
- ❖ Greeks were rich enough for some people to have the leisure to think some were able to devote their lives to science or religion.
- ❖ Later Greeks began philosophy, 'philosophers' were people who loved to think about the world and try to explain it with their minds.
- ❖ They made discoveries in science, mathematics and astronomy, looking for **natural explanations** not just supernatural ones.
- ❖ Ancient Greece was important for
 - advances in anatomy
 - the beginnings of a scientific approach to medicine
 - doctors trained in Alexandria practised all around the Mediterranean, spreading Greek ideas

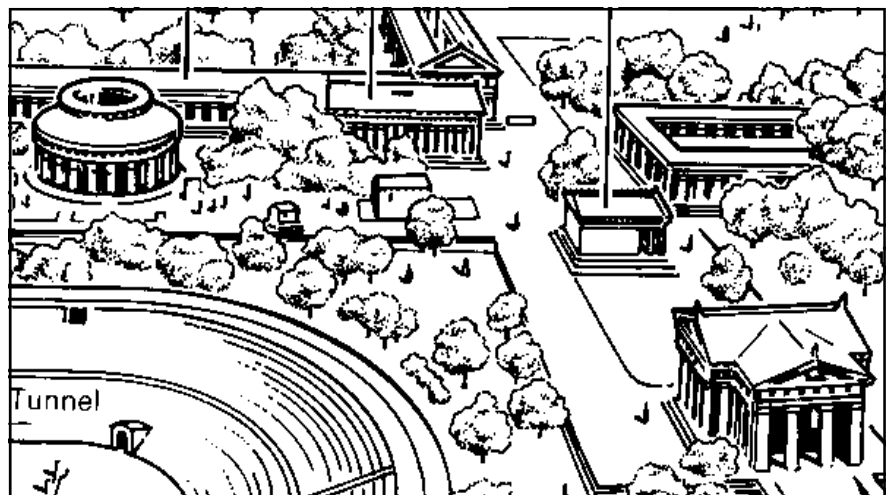
CAUSE & CURE

'A mixture of supernatural & natural'

- ❖ At first Greeks still said that gods caused illness. Honouring Asclepius, the god of healing, the Greeks built healing centres, called Asklepia, including a temple to the god and places for patients to sleep.
- ❖ They believed patients would be cured through visitations by Asclepius and his daughters, Panacea and Hygieia. He would come bearing a snake entwined around his staff.
- ❖ During these visits natural treatments would also be applied e.g. rest, herbal remedies & exercise.

Asklepia were important because:

- ◆ They were the first places that were specially built for treatment of the sick.
- ◆ They provide us with a lot of evidence of cures used during this time.



CAUSE & CURE

- ❖ Inspired by Hippocrates of Cos some Greeks began to look for natural explanations for illness and began to practise clinical observation, followed by diagnosis and treatment.
- ❖ Greek thinkers emphasised the idea of **balance** in all things including medicine.
- ❖ They believed it was important to lead a balanced lifestyle; to eat in moderation, to take exercise, to sleep regularly and to keep clean.
- ❖ Their belief in the **four humours** (blood, phlegm, black bile, yellow bile) was a reflection of this idea of balance.
- ❖ They believed that imbalance in any of the 'four humours' caused illness and doctors could restore the balance by, for example, blood-letting.
- ❖ Balancing the 'Four Humours' was the first real attempt to explain illness naturally. It was wrong but it lasted c.2000 years and set medical development in the right direction.
- ❖ **Natural ideas did not suddenly replace supernatural ones. Both could be used at the same time.**

ANATOMY & SURGERY

- ❖ Dissection was not encouraged but it was allowed in Alexandria.
- ❖ Simple surgery for soldiers and athletes who were injured. E.g. mending broken bones.
- ❖ Used blood letting

WAR

- ❖ Alexander the Great conquered Middle East and Egypt. He took ideas back to Greece.
- ❖ Movement of armies in war also helped to spread disease around, this caused loss of life because people came across diseases they had no resistance to.

PUBLIC HEALTH & WELFARE

- ❖ In Crete there was an advanced system of drainage and water supply at the royal palace.
- ❖ Greeks did emphasise the importance of cleanliness and washing.

SUPERSTITION & RELIGION

- ❖ Religion was closely linked with medicine throughout this period.
- ❖ The healer was usually a holy man and the centres of healing were usually religious places.
- ❖ Prayers were said, spells were chanted and charms held when a medicine had to be taken or an operation carried out.
- ❖ People in ancient societies wore lucky charms, which suggests a belief in powerful spirits.

COMMUNICATION

- ❖ The Greeks traded across the Mediterranean, this enabled them to spread their ideas and pick up new ones.
- ❖ A huge library at the city of Alexandria in Egypt stored ideas on medicine.

CHANCE

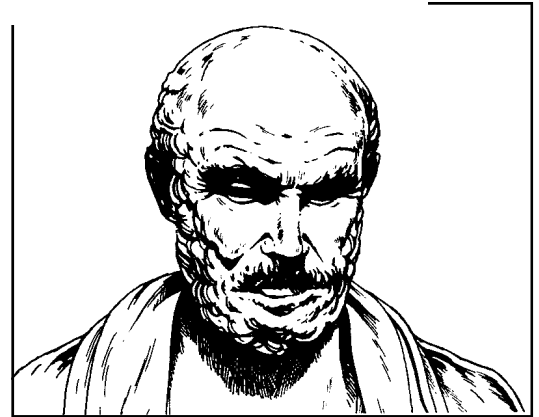
- ❖ Early public health systems were destroyed by earthquake & therefore could not be copied.

DOCTORS & NURSING

- ❖ Practical cures in Asklepia were carried out by the doctor/ priest.
- ❖ Hippocrates was a very influential doctor at this time.
- ❖ Doctors who followed the teachings of Hippocrates were recognised as doctors not priests. This was the beginning of the medical profession.
- ❖ Women could be trained as doctors.

INDIVIDUALS

Hippocrates (c.460-377 BC)



- ❖ His ideas were followed by Galen.
- ❖ He had many followers and a number of medical books were written around his work. These books emphasised:
 - **Natural explanations**
Hippocratic doctors looked for natural causes for diseases rather than blaming gods or spirits. They thought that the proportions of the four humours inside each human being affected a person's health. This theory, was a turning point because it said that illness was caused by natural factors inside the patient.
 - **Clinical Observation**
Hippocratic doctors observed the whole patient, noting all symptoms. They carefully recorded everything that happened and wrote it down. Only then would they diagnose the illness, describe what would happen and perhaps treat it. This is still the core of modern methods of medical treatment.
 - **Code of Behaviour**
Doctors had to treat their patients with respect, not take advantage of them. To this day, doctors take the "Hippocratic Oath" to behave properly.

ANCIENT ROME

500BC- 500AD

SUMMARY

- ❖ After 500 BC the Romans began to build a large empire in Europe.
- ❖ They used many Greek ideas about medicine and took some of them a step further.
- ❖ The best doctors in Roman times came from Greece, the most famous was Galen.
- ❖ The Romans were very practical.
- ❖ They developed new technology and the government had the money and power to enforce efficient public health systems.

CAUSE & CURE

‘A mixture of supernatural & natural’

- ❖ The Romans still believed in gods and goddesses but their doctors continued to work on natural ideas.
- ❖ Many early treatments used by the Romans were of little value. It was only after their conquest of Greece that their medical knowledge started to improve.
- ❖ They worshipped the same god of healing as the Greeks – Asclepius – and continued to build temples where medicine could be practised.
- ❖ They were more concerned with preventing disease than curing it.
- ❖ Believed disease could be caused by several things. These included sewage, bad air and dirty water.
- ❖ The Romans preferred prevention as opposed to treatment
- ❖ Illness was often treated with herbal medicines.
- ❖ Galen developed the ideas of Hippocrates and introduced many treatments based on the theory of ‘opposites’: treating imbalance in the four humours by giving something opposite to the humour that was in excess.

ANATOMY & SURGERY

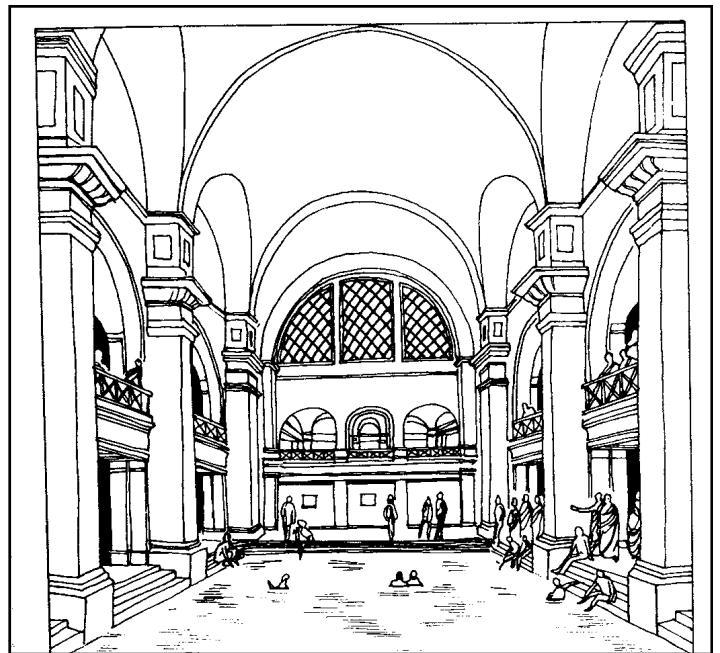
- ❖ Galen was extremely important in improving knowledge of the anatomy and surgery.
- ❖ Operations on gladiators.
- ❖ Surgeons carried out operations on the battlefield. In field hospitals wounds would be cauterised and anything more serious would lead to amputation.
- ❖ Remains of military hospitals and surgical tools have been found.
- ❖ Religion allowed some dissection but mainly on animals.
- ❖ Some human dissection was allowed at Alexandria but this was limited.

WAR

- ❖ Romans were quick to adopt the ideas of their conquered peoples. E.g. the Greeks had a big impact on Roman medicine.
- ❖ A healthy army was needed to defend the empire this encouraged the government to take action to try and prevent illness. Each army camp had doctors and surgeons. Through experience they learnt not to build a settlement near a swamp.
- ❖ Army doctors, 'Medici', developed their skills on the battlefield.
- ❖ Army spread Roman ideas and way of life.

PUBLIC HEALTH & WELFARE

- ❖ Romans were the first civilisation to develop a comprehensive public health system. Key area of progress. This was a time of progression in Public Health.
- ❖ The government built public baths, latrines, sewers, water fountains and aqueducts all over the empire.
- ❖ Cities were built on healthy sites.
- ❖ All military camps and many private houses had baths.
- ❖ Romans educated people to think the public health was important.



SUPERSTITION & RELIGION

- ❖ In early centuries Romans believed in supernatural causes of disease ~ Romans worshipped Gods.
- ❖ From 200BC—300AD they came into contact with ideas of Hippocrates and some looked to more rational explanations and natural treatments.
- ❖ Religion hindered progress as religious ideas forbade human dissection.
- ❖ Galen's ideas fitted with both Christian and Muslim beliefs. This made people less likely to challenge Galen.

TECHNOLOGY

- ❖ Romans' ability to design and make aqueducts, baths, drains etc lifted health standards.

DOCTORS & NURSING

- ❖ Many doctors in the Roman Empire, most of whom were Greeks.
- ❖ Doctors treated soldiers and gladiators and gained a great deal of experience in treating wounds.
- ❖ Most doctors were men but wives and mothers would still have provided most care.
- ❖ There were some female midwives.

COMMUNICATION

- ❖ Ideas could be spread easily around the empire as it was so stable.
- ❖ A huge library at the city of Alexandria in Egypt stored ideas on medicine.
- ❖ Galen trained at Alexandria.
- ❖ Galen wrote over 100 books, many of which survived the fall of Rome.



INDIVIDUALS

Claudius Galen 120 AD

- ❖ He was Greek and trained as a doctor at the Asclepion in Pergamum.
- ❖ His medicine was based on the ideas of the Greeks and Romans.
- ❖ He carried on the work of Hippocrates by teaching that doctors should study the symptoms of a disease before they treated it.
- ❖ He followed Hippocrates' observation methods and believed in the theory of the four humours. He developed many treatments, based on the theory of opposites.
- ❖ Galen stressed the importance of understanding the skeleton and the functions of parts of the body.
- ❖ He gained some knowledge of anatomy and physiology from treating wounded gladiators.
- ❖ He discovered that the brain controls the body through the nerves and proved his theory by dissecting a piggy!
- ❖ He realised the need to carry out experiments, but human dissection was not acceptable. He had to base his ideas on the anatomy of animals but this often led to mistakes in his descriptions (e.g. about the jaw bone and heart).
- ❖ Galen was very important. He gave lectures and wrote over 60 books, drawing together the ideas of all the great doctors of the ancient world in the 500 years since Hippocrates.
- ❖ Galen talked about 'the creator' in his books. This made his work acceptable to both Christian and Islamic cultures as it fitted in with their teachings.
- ❖ His theories, even his mistakes, formed the basis of doctors' training during the Middle Ages and the Renaissance.

THE MIDDLE AGES

500AD - 1500

SUMMARY

- ❖ Following the collapse of the Roman Empire, Western Europe was in chaos.
- ❖ There was instability and war.
- ❖ Learning was lost as libraries and universities collapsed.
- ❖ The ideas of Hippocrates and Galen were kept alive in the Middle East.
- ❖ In the West, the Christian Church grew in power. The church cared for the sick but it also taught that God allowed and cured illness.
- ❖ In the Middle East a new religion, Islam, spread rapidly.
- ❖ Muslim doctors of the Islamic Empire were much better at treating disease than Europeans.
- ❖ By about 1300 new ideas were being put forward but acceptance of such ideas was slow. This was a time of little change in medicine.

CAUSE & CURE

- ❖ The Christian Church dominated people's lives.
- ❖ This is a period of regress in that many beliefs about the cause and treatment of disease were based on the supernatural.
- ❖ **However...**
- ❖ Natural remedies based on the theory of the four humours was also used.
- ❖ Doctors used a handbook called a vademecum containing various charts, for example to compare the colour of a patient's urine, which helped them to diagnose illness.
- ❖ Monasteries provided treatment for the sick. Monks experimented with herbs and natural cures. They built up a great deal of practical knowledge.



Superstition

- ❖ It was thought God caused disease and therefore only he could cure you. Treatments consisted of prayer, a specially blessed potion, pilgrimage, or even flagellate (whip) yourself as punishment for your sins.
- ❖ Charms and spells could cure illness
- ❖ Doctors believed that the position of the planets affected people's lives and health. Some people would consult zodiac charts to choose the best treatments or the best time for an operation
- ❖ Going on a pilgrimage would cure an illness
- ❖ Being touched by a king or queen could cure scrofula



Natural or Rational ideas (a scientific approach)

- ❖ The balance of the four humours e.g. blood letting
- ❖ The use of herbs and plants to make medicines
- ❖ Urine analysis was a useful indication of the way the body was working.
- ❖ There were some hospitals, but they offered food, a bed and prayers rather than a cure

- ❖ **The Black Death** killed off one-third of the population of Europe in the 1300s.
- ❖ People did not know what caused it and blamed many things including:
 - Sinners
 - The planets
 - Foreigners
 - Dirty water
 - Bad air

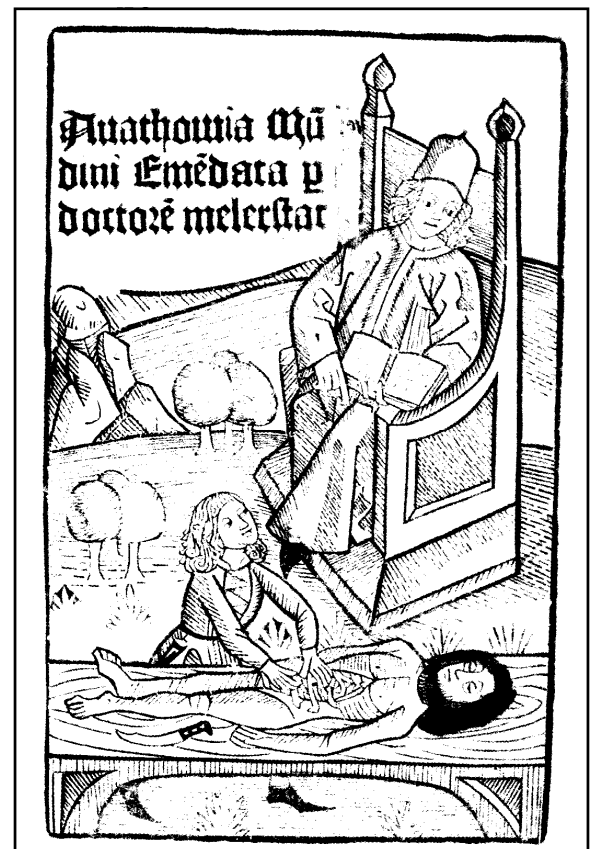
Emergency measures were introduced to deal with the problem. King Edward III and King Richard II ordered the streets of London to be cleaned and the river Thames to be dredged.

COMMUNICATION

- ❖ At the start of the Middle Ages wars made communication very difficult and it was hard for doctors to learn or discuss ideas.
- ❖ Towards the end of the Middle Ages medical schools were being established.
- ❖ Arab writers translated books by Galen and Hippocrates. Galen's work was kept alive by Arab doctors.
- ❖ Spread of Arabic ideas to Europe via trade and the Crusades.

ANATOMY & SURGERY

- ❖ Dissection was banned thus limiting the study of the anatomy. Continued to believe in the ideas of Galen.
- ❖ Surgical knowledge from Greek and Roman times had been lost or ignored.
- ❖ Barber surgeons, who had little skill or knowledge, carried out most simple surgery.
- ❖ Surgery was simple and external such as the removal of cataracts.
- ❖ Most operations, though simple, resulted in a high number of deaths due to shock, loss of blood and infection.
- ❖ No anaesthetics although some herbal mixtures were used to deaden the pain but they could prove to be lethal!
- ❖ Hot cauterising irons were used and amputations were performed.
- ❖ Hugh & Theoderic of Lucca used wine to clean wounds but the ideas were not widely adopted as many continued to believe Galen's view that 'pus was good!'



WAR

- ❖ During the Dark Ages there were many wars, some of which led to the destruction of the libraries that held knowledge built up by the Romans.
- ❖ During the Dark Ages wars made travelling more difficult and this slowed down the exchange of ideas.
- ❖ An increased number of wars did however mean more wounds so surgeons gained a lot of practical experience. Methods of treating wounds, however, did not change from Roman times (cauterising and amputation).

PUBLIC HEALTH & WELFARE

- ❖ Knowledge of public health was lost after the Roman Empire fell. This was a time of regression in Public Health.
- ❖ Roman buildings etc were allowed to fall into ruins.
- ❖ Apart from in the monasteries, people forgot about the importance of clean water. Monasteries had washrooms, latrines, clean water and drains but because they were isolated people did not learn from their example.
- ❖ Medieval towns were filthy, little was done to clean them up.
- ❖ Sometimes town councils did take action, during the time of the Black Death in London emergency measures were introduced.

RELIGION (In the West)

- ❖ Christian Church controlled all learning.
- ❖ Human dissections were not allowed so little new knowledge was found. However by about 1300 the Church began to allow some public dissection in universities.
- ❖ Galen's work was still followed as it fitted with the Christian religion. Therefore his ideas were not allowed to be challenged.
- ❖ Monasteries were the centres of learning and knowledge during this time.
- ❖ The Church set up a lot of hospitals but only a few of these treated the sick. Monks and nuns who ran the hospitals were more concerned with patients' minds than their bodies.

RELIGION (In the East)

- ❖ The Islamic religion encouraged personal cleanliness.
- ❖ The Islamic religion encouraged caring for the sick and elderly, hospitals were built. These tended to have separate wards for different diseases. This enabled epidemics to be controlled.
- ❖ In Cairo and other cities there were doctors who held surgeries for the sick and who prescribed medicines.
- ❖ The Islamic religion also forbade human dissection.
- ❖ The distrust that existed between Christians and Muslims hindered progress.

SCIENCE

- ❖ Islamic 'alchemists' made great advances in chemistry. These new methods were then used in the preparing drugs. New drugs were developed.

DOCTORS & NURSING

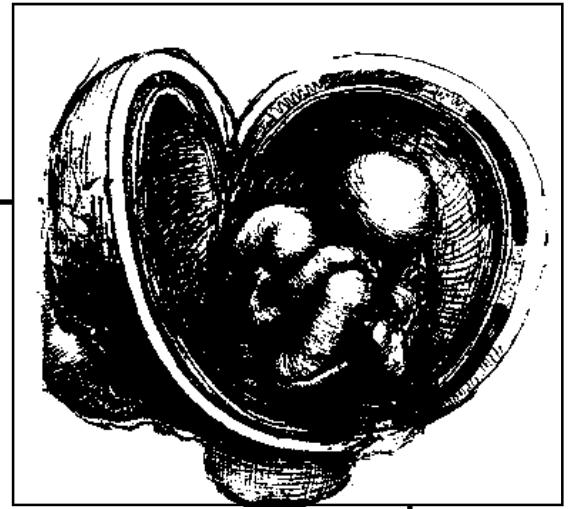
- ❖ Education was controlled by the Church which set up universities where doctors could train. Women were not allowed to go to university and therefore could not become physicians.
- ❖ Physicians had a higher status to surgeons and barber surgeons.
- ❖ It was possible for women to train as surgeons, because surgeons were trained by apprenticeship and not in the universities.
- ❖ In the East doctors were trained in medical schools. Rhazes and Avicenna wrote many books that were used in these schools.
- ❖ In the East nurses were also trained to work in hospitals.

INDIVIDUALS

- ❖ Best doctors were Arabs such as Rhazes, Avicenna & Ibn an Nafis.
- ❖ Ibn an Nafis discovered some errors in Galen but as the Qur'an forbade dissection he could not prove his theory. Old views continued.
- ❖ Galen's ideas continued to dominate.

THE RENAISSANCE

1500 - 1750



SUMMARY

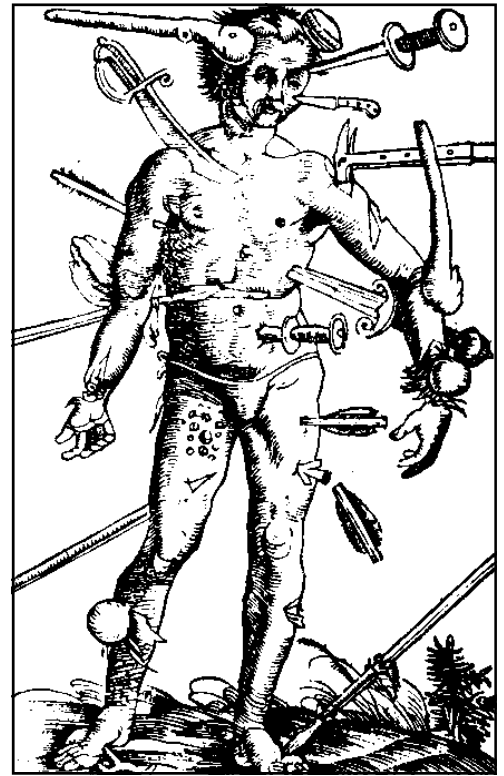
- ❖ Renaissance means 're-birth'. It describes a period of great change.
- ❖ This started in Italy with painters and architects but it spread all over Europe, helped by the printing press which was invented at this time.
- ❖ New ideas flourished when several countries broke away from the Roman Catholic Church in the Reformation. The development of Protestantism meant that more people began to accept that disease had natural causes.
- ❖ A scientific approach to medicine returned with Vesalius, Pare and Harvey.
- ❖ Great discoveries were made especially in anatomy and physiology. Progress was also made in surgery.
- ❖ The 4 main factors for change in the Renaissance were:
 - The revival of classical learning
 - The invention of the printing press
 - The Church was criticised for the first time
 - Voyages of exploration
- ❖ Despite such advances there was little change in how sick people were treated during this time, especially among the poor. Benefits only came later.
- ❖ No new discoveries were made in the causes and treatment of diseases.

CAUSE & CURE

- ❖ Many of the ideas that had dominated the Middle Ages continued.
- ❖ By the time of the Great Plague in London in 1665, many people still believed it was a punishment from God.
- ❖ Treatments were still based on a mixture of supernatural and the four humours.
- ❖ Bleeding was still used. Leeches were used to bleed the wealthy, the poor had blood let from a vein using a special knife called a fleam.
- ❖ Apothecaries supplied medicine from their shops. Although they were not trained, they had practical experience.
- ❖ Women still did most unpaid medicine.
- ❖ Vesalius and Harvey said little about causes of illness or treatments and Pare met a lot of resistance to his ideas.

ANATOMY & SURGERY

- ❖ Progress was slow and techniques were often similar to the ones used in the Middle Ages.
- ❖ The main method of stopping a wound bleeding was to **cauterise** or seal it with a hot iron.
- ❖ Individuals such as Vesalius, Pare and Harvey made significant contributions to anatomy and surgery during this time.
- ❖ Vesalius expanded knowledge of the anatomy.
- ❖ Pare developed surgery by challenging old ideas and methods. He found new treatment for gunshot wounds and amputations.
- ❖ Harvey discovered that the heart pumped blood around the body and showed how the blood circulated around the body.



PUBLIC HEALTH & WELFARE

- ❖ During this time the population of Europe increased significantly, towns and cities grew which created more problems.
- ❖ There was little improvement in public health as people did not view it as important.
- ❖ Towns remained dirty, although rich people did have better hygiene than the poor.
- ❖ Poor conditions was a major factor in the repeated outbreaks of the Plague in London during the 17th century.
- ❖ The stench that arose from the city streets reinforced the belief that disease was caused by bad air.

SUPERSTITION & RELIGION

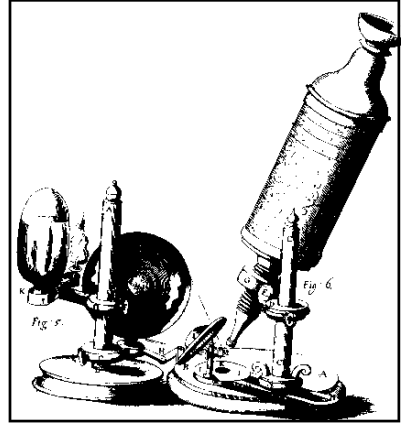
- ❖ In the Reformation the Catholic Church lost its hold over many countries, as well as universities and education.
- ❖ The power of the Church declined, as old ideas were proved wrong.
- ❖ People became less willing to accept the Church's rulings about issues such as dissection.
- ❖ Pare thought God had guided him to discover the use of ligatures when amputating.
- ❖ Many women were accused of and executed for witchcraft.

COMMUNICATION

- ❖ People travelled more and had greater contact with other societies.
- ❖ New drugs were brought back from the New World, such as quinine, which could be used against malaria.
- ❖ The development of the printing press allowed knowledge to be spread more quickly and cheaply than ever before.

TECHNOLOGY

- ❖ The printing press meant ideas could be spread quickly and cheaply.
- ❖ Better ships and navigation equipment led to new discoveries.
- ❖ The microscope encouraged more scientific experiments.
- ❖ Technology also inspired men to understand the human body more. E.g. 'pumps' and the heart.



CHANCE

- ❖ By chance Pare ran out of oil and made up a dressing from a mixture of egg yolks, oil of roses and turpentine. He discovered that simple dressings and bandages were a better way of treating gunshot wounds than cauterising them using boiling oil.

WAR

- ❖ New developments such as the use of gunpowder meant there were new types of wounds which now went deep into the body.
- ❖ Army surgeons showed the highest level of surgical expertise because the large number of injuries suffered by soldiers meant that they gained in depth knowledge about anatomy.
- ❖ Three main challenges facing the surgeon were pain, infection & bleeding which meant the time an operation could take was limited.
- ❖ Ambroise Pare was a French army surgeon. It was his experiences in war that led to his discoveries.

SCIENCE

- ❖ During the Renaissance scientific experiment developed. In 1661, Charles II, who was interested in science, founded the Royal Society. Many great medical scientists became members and shared ideas.
- ❖ Careful and exact experimentation and new approaches were encouraged. E.g. Vesalius observed and compared; Pare tested e.g. Bezoar; Harvey observed, calculated and proved his theories.

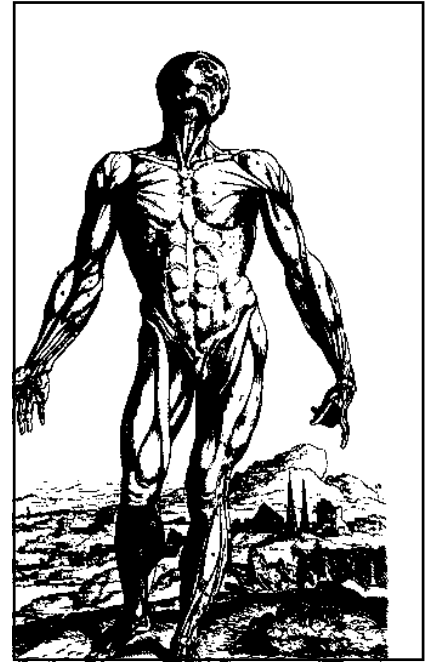
DOCTORS & NURSING

- ❖ More modern training of doctors began at this time. More practical 'hands on' training was given, rather than a reliance on copying the ideas of Galen and Hippocrates.
- ❖ Published works by individuals such as Vesalius, Pare & Harvey improved the training of doctors. However despite such training there was little change in the way doctors treated disease.

INDIVIDUALS

Andreas Vesalius 1514—1564 (Anatomy)

- ❖ Vesalius became Professor of Anatomy at Padua University in Italy, an important centre for medical training during the Renaissance.
- ❖ He said it was vital for doctors to dissect human bodies to find out about the human structure and how it works.
- ❖ He published his great book 'The Fabric of the Human Body' in 1543 it showed the human body in greater detail than ever before. He was able to include detailed anatomical drawings.
- ❖ He was able to prove that some of Galen's theories were wrong e.g. the heart and the jaw.
- ❖ Vesalius is important because
 - He proved Galen had made mistakes; this encouraged others to find out more.
 - He encouraged dissection and careful observation.
 - His work was accurate and printed, therefore available for training doctors.



William Harvey 1578—1657 (Physiology)

- ❖ He studied in Italy at the University of Padua where he became interested in anatomy and in particular, the work of Vesalius.
- ❖ He experimented and used scientific method, measuring the flow of blood through the heart, experimenting of humans and animals.
- ❖ Harvey discovered that blood circulated around the body in a 'one-way' system.
- ❖ He proved that the heart was a pump that forced blood around the body through arteries. Veins then returned the blood to the heart where it was recycled.
- ❖ In 1628, Harvey published details of his work in his book 'An Anatomical Exercise Concerning the Motion of the Heart and Blood in Animals'.
- ❖ Harvey is important because
 - He proved Galen's theory (that blood moved through the heart by passing through walls in the septum and that the body made new blood as its supplies were used up) which had been popular for 1400 years was wrong.
 - He showed the importance of scientific methods, tests and proof.
 - He encouraged others to investigate blood circulation.
- ❖ **However.....**
- ❖ His ideas were considered eccentric and his work made little difference to general

Ambroise Pare 1510—1590 (Surgery)

- ❖ He trained as a barber surgeon.
- ❖ He developed his skills as a surgeon whilst treating soldiers during wars. Usual treatment for gunshot wounds was to chop off damaged limbs and dip the stump in boiling oil. Small wounds were cauterised with a red hot iron.
- ❖ In 1536 he ran out of oil and so he treated the gunshot wounds with simple dressings (turpentine, oil of roses and egg yolks) & bandages rather than using boiling oil. This was a chance discovery.
- ❖ He also believed God had guided him to use ligatures to stop the bleeding after amputations rather than a red hot cautery iron.
- ❖ The practice of using ligatures introduced germs from the surgeon's hands into the wound and thereby increased the chances of infection (until antiseptics).
- ❖ He published his ideas in a book, *The Collected Works of Surgery*, in 1575.
- ❖ The Paris College of Physicians tried to stop the publication of his texts and never accepted Paré because he was only a barber-surgeon but Pare had the support of the king.

Grace Mildmay

- ❖ She was married to a rich man and was expected to look after the health of her family.
- ❖ She learnt traditional methods using herbs but she also read the most recent medical books.
- ❖ She used the Theory of the Four Humours in the treatment of disease.
- ❖ She is unusual because she was a well—informed woman healer and she left detailed records of her activities. She combined the understanding of traditional ‘wise women’ and university trained doctors.

Thomas Sydenham (Doctor)

- ❖ He was the most important doctor in England in the 17th Century.
- ❖ He didn't make any new discoveries about the cause of disease but did emphasise the importance of careful observation and keeping accurate records.

THE INDUSTRIAL REVOLUTION

1750 - 1900

SUMMARY

- ❖ As the Industrial Revolution went on in Britain people expected to be able to use science and technology to overcome problems.
- ❖ They used ideas from science and industry to help improve medicine. Scientists worked hard to find out more about what caused disease.
- ❖ Germs were found to be the cause of many diseases. This led to new drugs and vaccines and better hygiene in operations and cities.
- ❖ Governments got more involved in looking after the people, especially after the working classes got the right to vote.
- ❖ The Industrial Revolution led to a Medical Revolution. Most medicine since this time has been scientific. There was undoubtedly a lot of progress during this time.

CAUSE & CURE

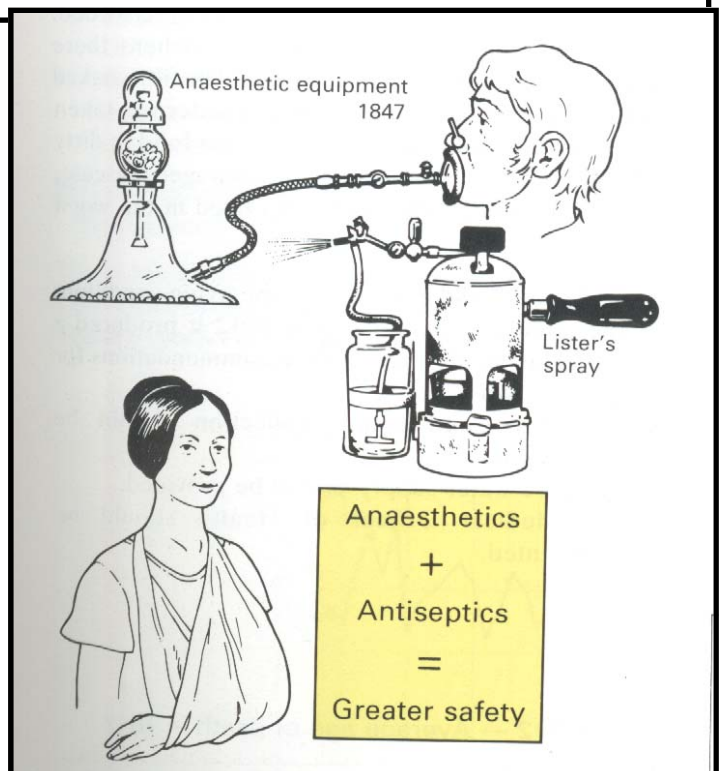
- ❖ In the eighteenth century smallpox had become a common disease. An early method of fighting it was inoculation. First successful treatment of smallpox in Britain, using inoculation, was carried out by Lady Mary Wortley Montagu
- ❖ Inoculation involved infecting people with a mild form of the disease in the hope that they would not catch the serious version.
- ❖ In 1796 Edward Jenner discovered vaccination.
- ❖ In the 1800's people believed that dirt & bad air/miasma caused disease. This was reinforced by outbreaks of Cholera, which occurred when the weather was hot and there was rubbish lying in the streets.
- ❖ People believed in the theory of spontaneous generation, that micro-organisms were caused because of disease and appeared because of illness.
- ❖ In 1861 Pasteur published the germ theory of disease; that germs in the air caused decay. This proved that the theory of spontaneous generation was wrong.
- ❖ Koch discovered that germs also caused disease in humans. He identified specific germs, which caused different diseases. From this, Koch was able to find ways of killing the particular germ that caused a particular disease.
- ❖ Pasteur also built on the work of Jenner, he discovered vaccines which could be used to prevent specific diseases.

ANATOMY & SURGERY

- ❖ Operations before the mid-19th century involved great pain, sometimes masked by alcohol, and a likely chance of infection. The patient could also die of shock or blood loss.
- ❖ This was a time when surgery improved. Advances in science and technology in the 19th century helped to stop most of these problems.
- ❖ **Pain** was overcome by the introduction of **anaesthetics**.
 - ◆ 1799 Davy discovered laughing gas but ideas were not publicised.
 - ◆ 1846 Liston used Ether. Queen Victoria used it during child birth giving it the royal seal of approval!
 - ◆ 1847 Simpson by chance discovered Chloroform, it was easier to breathe compared to Ether but patients began to die unexpectedly. People went back to using Ether.
- ❖ Surgery was still quite dangerous however until the introduction of **antiseptics** which tackled the problem of **infection**.
 - ◆ 1846—1860 was the 'black period' in surgery.
 - ◆ Joseph Lister read Pasteur's work on Germ theory. He began to use carbolic acid to kill infection in wounds. He developed a carbolic spray which was effective but which was difficult to use.
- ❖ Once the germ theory had been accepted, antiseptics were understood and surgeons began to sterilise their equipment. This began aseptic surgery.
- ❖ Surgeons became more confident and performed more and more complex operations.
- ❖ Blood loss was still a major problem during this time. **No successful way of dealing with this until 1901.**

WAR

- ❖ Crimean War (1854—56) showed that hospitals and nursing were at a low standard. Florence Nightingale and Mary Seacole tried to improve conditions and the standard of nursing that was provided.
- ❖ Franco-Prussian War 1870 made Pasteur and Koch rivals. Their rivalry encouraged new discoveries in the prevention and treatment of disease.



GOVERNMENTS

- ❖ The government were impressed by Jenner's success rate. They accepted his idea, funded a vaccination clinic and later made vaccination compulsory.
- ❖ Civil servants e.g. Chadwick encouraged Public Health although some MP's did resist expensive Public Health measures.
- ❖ The government took more decisive action with regards to Public Health during this time.
- ❖ Pasteur and Koch were national heroes in their own countries. The governments of both their countries provided funding for research units which they led.

PUBLIC HEALTH & WELFARE

- ❖ Before the 19th century nothing had been done about public health for many years. This was mainly because most governments' felt they should not interfere too much in people's lives (*laissez-faire*) and any large-scale public health improvements were very expensive.
- ❖ In the industrial period living conditions got a lot worse this was mainly because:
 - The population increased rapidly
 - People moved to towns to seek work in factories this caused overcrowding.
 - Houses were built as cheaply as possible.
- ❖ The government was forced to intervene due to extreme conditions e.g. there was an increase in diseases such as typhoid and cholera.
- ❖ Cholera was a deadly epidemic, which affected the rich and the poor. There were outbreaks in 1831-2 & 1848. This in addition to the findings of Chadwick prompted action from the government. (Edwin Chadwick had shown the connection between health and hygiene.)



PUBLIC HEALTH & WELFARE

Key Dates

1834 Poor Law Amendment Act

Medical officers were appointed to workhouses, which provided basic medical care for the poor.

1842

Edwin Chadwick produced a report of the 'Sanitary Conditions of the Working Classes' and this led to the beginnings of Public Health legislation.

1848 Act (General Board of Health)

The General Board of Health was created and although it was abolished 10 years later. The act **encouraged** local boards of health to be set up to appoint a medical officer, provide sewers, inspect lodging houses and check food which was offered for sale. This Act was taken up by some towns and cities, but many did not as the ratepayers did not want to pay for improvement.

1853 Act

Vaccinations were made compulsory although no-one was given the power to enforce them.

1855 Nuisance Removal Act

This act made overcrowded housing illegal.

1859 Construction of a new sewage system for London begun.

This followed the 'Great Stink' of 1858, when Parliament had to be suspended because the Thames was so polluted.

1864 Factory Act

This made unhealthy conditions in the factories illegal

1866 Sanitary Act

This made local authorities responsible for sewers, water and street cleaning.

1868 Act

This encouraged the improvement of slum housing or its demolition.

1871 Vaccinations Act

This made sure that the previous vaccinations act was obeyed.

1875 Artisans Dwelling Act

This made the house owners responsible for keeping their properties in good order and gave local authorities the right to buy and demolish slums if they were not improved.

1875 Public Health Act

This brought together a range of acts covering sewerage and drains, water supply, housing and disease.

RELIGION

- ❖ Some people were worried that it was against their religious beliefs to give women anaesthetics during childbirth. They believed that God had intended women to suffer the pain.
- ❖ Missionaries spread western medicine throughout the world.

COMMUNICATION

- ❖ Telegraphs, railways, steamships speeded up the spread of ideas.

TECHNOLOGY

- ❖ Early microscopes were improved upon.
- ❖ X-rays were discovered by Roentgen in 1895. This enabled doctors to see the bones and the internal organs of the body. At first he did not realise the dangers of the process and his workers suffered from the effects of radiation on their hands.
- ❖ Better steel tools and new machines all helped.

CHANCE

- ❖ Pasteur only came into medicine by luck. He was employed to find the explanation for the souring of sugar beet used in fermenting industrial alcohol. It was during this research that he came upon blaming the germs in the air.
- ❖ Later the chicken cholera experiment led to a chance discovery, the secret of vaccines.

SCIENCE

- ❖ This was very important to the development of medicine during this time.
- ❖ Physics, Chemistry and Biology all developed as separate sciences
- ❖ Chemists began to identify key chemicals. This later helped them to understand the body, make drugs and anaesthetics etc.
- ❖ Louis Pasteur was a chemist & Koch was a micro-biologist.
- ❖ Research teams were set up by

DOCTORS & NURSING

- ❖ In 1780's Dr. William Smellie began to train midwives for the first time.
- ❖ In 1784 Surgeons became a separate profession to Barbers. From this point Surgeons became more respectable.
- ❖ In the 18th and first half of the 19th centuries nursing was an unpopular and lowly paid profession.
- ❖ By the second half of the 19th Century nursing became a more respectable profession. Factors that brought about this change were the Crimean War and the role of Florence Nightingale.
- ❖ In 1849, an American Elizabeth Blackwell became the first woman to qualify as a doctor. In 1868 she helped establish a medical college in New York for women who wished to be doctors.
- ❖ In 1859 Elizabeth Garrett Anderson, a British woman, decided to train to become a doctor. She faced enormous opposition and even after qualifying she could not practise medicine as medical colleges would not register her. A legal battle followed. She won and was able to practise from 1865.
- ❖ 1874 The London School of Medicine was founded and this allowed women to train as doctors.

INDIVIDUALS

Florence Nightingale (Nursing)

- ❖ In 1854 the Crimean War broke out. Florence worked as a nurse in the emergency hospital at Scutari.
- ❖ Florence led a party of 38 nurses to clean up the hospital, she cleaned up the wards' toilets and kitchens. The death rate among the soldiers fell.
- ❖ She then spent 3 years advising government on changes to Army hospitals.
- ❖ Florence Nightingale used her fame to help her change the face of nursing forever.
- ❖ In her book 'Notes on Nursing' she explained her methods. This became the standard textbook for future generations of nurses.
- ❖ In 1860 she set up the Nightingale School of Nursing in St Thomas' Hospital, London to train nurses.
- ❖ Florence Nightingale brought a new sense of discipline and professionalism to nursing.

Mary Seacole (Nursing)

- ❖ She was a black West Indian, who faced racial prejudice. She paid her own way to the Crimea where she worked near the battlefield tending to the sick and wounded.

INDIVIDUALS

Edward Jenner (Vaccinations)

- ❖ He was a country doctor in Gloucestershire and a member of the Royal Society.
- ❖ He was interested in the latest developments in science and knew that experimenting was vital to making progress.
- ❖ He had heard rumours that dairy maids with cowpox didn't catch smallpox. He decided to test to see if one disease prevented the other.
- ❖ In 1796 Jenner tested his theory by injecting James Phipps with cowpox and then later with smallpox. James survived and Jenner tested his theory on others, all of whom survived.
- ❖ Jenner named this process vaccination and published his results in 1798.
- ❖ He was opposed by many doctors; he was an unknown country doctor and he could not explain why his method worked.
- ❖ The general public were also worried, they did not understand the process and some of them were terrified of being injected with an animal disease.
- ❖ Jenner himself did not fully understand how vaccinations worked, he just proved that it did.
- ❖ Jenner is important because
 - The government accepted his idea as they could see his success rate, they funded a vaccination clinic and later made vaccination compulsory.
 - His work laid the foundation for the future. He had begun to combat disease by immunisation. The idea of injecting people with a disease to prevent

Edwin Chadwick (Public Health)

- ❖ He published a 'Report on the Sanitary Condition of the Labouring Population of Great Britain' in 1842. He gathered information on conditions in towns and recommended reform.
- ❖ He believed that improved public health provision and a healthy workforce would save money rather than cost money.
- ❖ The report, which described levels of sickness and mortality shocked some of the privileged classes.

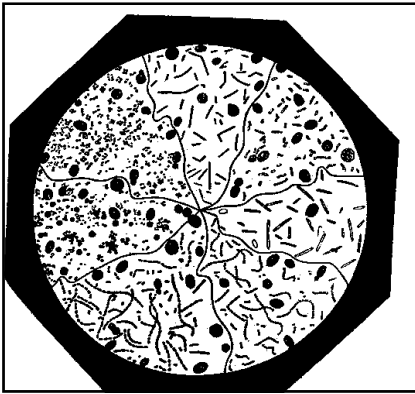
James Simpson (Anaesthetics)

- ❖ In 1847 he discovered the benefits of chloroform as an anaesthetic.
- ❖ His discovery meant that surgeons now had more time to operate, which meant that they could do more complex operations. However the death rate actually increased as mistakes were made, and the risk of infection was still great.
- ❖ Anaesthetics was strongly opposed by some doctors, nurses and the public.



Joseph Lister (Antiseptics)

- ❖ In 1867 he began to use carbolic acid to kill infections in wounds.
- ❖ Sprays were used in operating theatres. These were quite unpopular with some as they were messy and involved extra work, they also made instruments slippery to handle. However as a result of his work death rates from infection began to drop rapidly.
- ❖ Lister met opposition to his ideas this was because
 - ◆ It takes time for people to accept new ideas.
 - ◆ New ideas can mean more work.
 - ◆ New ideas can make those who did things the old way look foolish, incompetent or uncaring.



Louis Pasteur (Germ theory)

- ❖ Micro-organisms had been seen through microscopes but scientists thought that they were caused by disease and appeared because of illness. This was the theory known as spontaneous generation.
- ❖ In 1861 Pasteur published his 'GERM THEORY' which stated that living organisms fall from the air and cause decay.
- ❖ In 1864 Pasteur devised a series of experiments to prove his germ theory. He proved that the air contains micro-organisms, that microbes are not evenly distributed in the air, that microbes in the air cause decay and that microbes can be killed by heat.
- ❖ He showed the importance of testing ideas in a scientific way. A German, Robert Koch built on his work.
- ❖ Hearing of Koch's work Pasteur came out of retirement and from 1887-1881 he began to work on vaccines.
- ❖ He discovered a vaccine for chicken cholera & anthrax in animals and a vaccine against rabies that also worked on humans.

Robert Koch

- ❖ Koch was a German scientist, influenced by Pasteur's work. In 1872 he began research into the micro-organisms affecting animals and people.
- ❖ He showed that pus from patients' wounds were caused by germs on the surgeons hands. This paved the way for aseptic surgery. The whole operating theatre, equipment, clothes were germ free before the operation started.
- ❖ His careful research and observation using the microscope, photography and dyes led to a breakthrough in the fight against two of the deadliest diseases of the late 19th century. In 1882 he identified the bacteria causing tuberculosis (TB). A year later, in 1883, he identified the bacteria causing cholera.

THE MODERN PERIOD

1900- Present

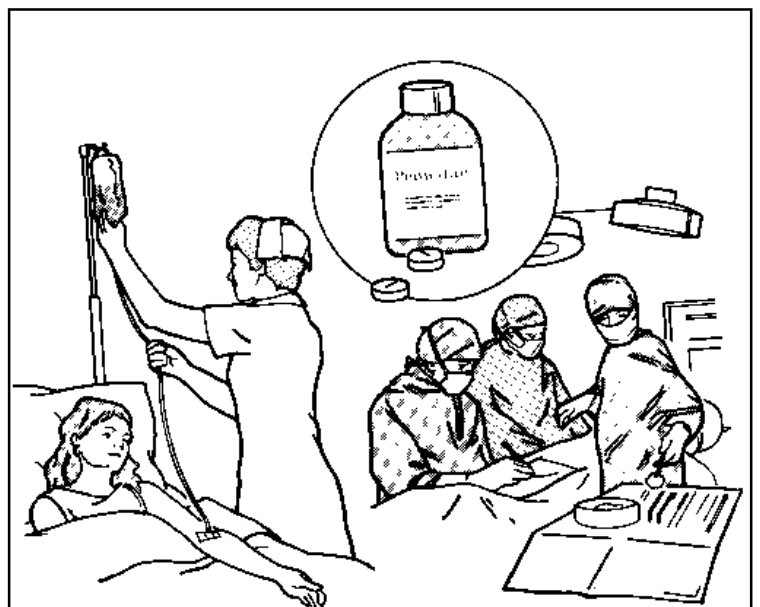
SUMMARY

- ❖ The scientific approach of the nineteenth century is taken even further. This a period of rapid change in medicine.
- ❖ Doctors are trained to very high standards and use very complicated technology.
- ❖ There are new chemical drugs and new knowledge is being built up as education has spread.
- ❖ People in the West are rich and can afford expensive medicine especially where governments run National Health Services.
- ❖ However some in the world still rely on ancient medicine e.g. plants, herbal remedies and superstition.

CAUSE & CURE

- ❖ Better scientific knowledge of the body means chemical “magic bullet” drugs are made. Paul Ehrlich, one of Koch’s pupils, discovered that chemical dyes could attack and destroy disease causing germs. In 1909 he discovered Salvarsan 606, a cure for syphilis.
- ❖ Penicillin, the first antibiotic, discovered by Fleming in 1928.and later developed by Florey and Chain. This development is important as penicillin can kill many different types of germs.
- ❖ 1932 Domagk discovered sulphonamides which could cure several infectious diseases including pneumonia and scarlet fever.

- ❖ Thousands of new cures are now possible. However there were some problems with certain high tech drugs e.g. ‘Thalidomide’ .
- ❖ Recently,, some germs have become immune to antibiotics and there are some new diseases for which there are still no cures e.g. AIDS
- ❖ Alternative treatments, such as acupunctue and homeopathy, have become popular again.



ANATOMY & SURGERY

- ❖ Period of rapid change in surgery. Loss of blood was the last problem to be successfully tackled.
- ❖ Development of aseptic surgery and high tech machinery.
- ❖ Blood groups were discovered in 1901 by Karl Landsteiner, this meant transfusions were much more successful, this was especially important in the war.
- ❖ In 1938 the British National Blood Transfusion Service was set up providing surgeons with a back up supply of blood.
- ❖ 1943 Kolff made the first artificial kidney machine.
- ❖ 1953 Development of heart-lung machines to keep patients alive during operations.
- ❖ 1960's. The development of micro surgery made it possible to join nerves so that limbs which had been chopped off could be put back on and made to work normally.
- ❖ Surgery became much more complex e.g. in 1967 Dr Christian Barnard performed the first heart transplant. Multi organ transplants are now commonplace.
- ❖ Development of key hole surgery allowing operations to be performed without making large cuts into the body.
- ❖ Factors which brought this about included the growth of industry, science, technology, communications, major wars and increased government funding.

WAR

- ❖ First World War increased the need for blood transfusions.
- ❖ Vast number of injuries in WW1 meant doctors were forced to try new techniques. New areas of medicine were developed, such as false limbs.
- ❖ 'Shell shock' led to further investigation into understanding and treating mental illness.
- ❖ War meant far more doctors and nurses were needed than ever before. Many women became doctors and the first women's nursing units were set up.
- ❖ However many doctors were diverted from useful research to front-line treatment.
- ❖ The outbreak of World War II in 1939 stimulated governments into funding the mass production of penicillin. Terrible burns sustained by pilots encouraged McIndoe to develop plastic surgery to cover up the scars.



GOVERNMENTS

- ❖ Increased government funding on research & public health.
- ❖ Governments began to realise that combating poverty led to less disease.
- ❖ Governments are more involved. Liberal government (1906-16) introduced school meals and medical inspections, old-age pensions and National Insurance.
- ❖ Beveridge Report in 1942.
- ❖ After WW2 the government provided more services e.g. free hospitals, blood banks and ambulances.
- ❖ National Health Service (NHS) set up in 1948.
- ❖ UN set up the World Health Organisation

PUBLIC HEALTH & WELFARE

- ❖ Governments take responsibility for housing, hospitals, food quality, pollution, child care etc.
 - ❖ Some objections to welfare state setting up 'nanny state'. Opposition to paying more taxes to help the poor.
 - ❖ **Landmarks in the growth of the Welfare State**
- 1902** ~ Midwives had to be properly trained and registered.
1906 ~ Free school meals for poor school children.
1907 ~ Medical inspection for school children.
1908 ~ Government paid Old Age Pensions.
1909 ~ Back to back houses banned.
1911 ~ National Health Insurance Act—working men received sickness pay and could see a doctor.
- 1919** ↑
1923 ↓ Acts which allowed councils to build Council houses for the poor.
1924 ↓
- 1942** ~ Beveridge Report recommended that the unemployed should also be able to benefit from the payments received by those who were in work.
1945 ~ Family Allowance Act gave money to every family for each child.
1948 ~ Start of the National Health Service. Treatment is based on the need and not the ability to pay. In 1948 all people in Britain were provided with medical treatment completely free of charge. Since then however more and more charges have been introduced, this is because new drugs are expensive, average life expectancy has increased and an increased burden is being placed on the service.

Why was 1900—1939 a time of progress in public health?

- ❖ Liberal Government (1906—1914) decided it was time for the government to tackle social evils present in society.
- ❖ Laissez-faire attitude of the 19th became less fashionable as attitudes towards causes of poverty changed.
- ❖ New research by Booth & Rowntree highlighted real causes of poverty. (Sickness, low wages, old age & unemployment.)
- ❖ War. Nation was shocked to discover 40% of the soldiers fighting in the Boer war suffered from malnutrition. After WW1 P.M promised to make G.B a country for heroes to live in. 'Homes for Heroes'

Why was the NHS introduced in 1948?

- ❖ Impact of WW2. The government was aware that medical services had to be adequate to cope with casualties and so increased its involvement. Hospitals provided free treatment.
- ❖ Beveridge Report, 1942 was a best seller, indicating that the public supported the idea that the state had a responsibility to care for its people.
- ❖ The election of the Labour Party in 1945. The Conservatives felt that a 'Welfare State' would be too costly whereas the Labour Party were prepared to push ahead with social reform.
- ❖ The work of Aneurin Bevan.

SCIENCE

- ❖ Almost all western medicine is based on a scientific approach.
- ❖ Science is more important in aiding medical development than in any previous period.
- ❖ There are now specialists in narrower and narrower areas of science.
- ❖ Use of science in research enables new chemicals and treatments to be developed.

COMMUNICATION

- ❖ Telephones, aeroplanes, film, video, computers etc have all helped to spread ideas quickly.

RELIGION

- ❖ Some religious groups oppose abortion.

CHANCE

- ❖ Chance was an important factor in Fleming's original discovery of the mould which was the basis for penicillin in 1928.

TECHNOLOGY

- ❖ Technological advances led to new machines and materials e.g. X rays, heart-lung machines & plastic.
- ❖ Importance of electricity, most medicine in the west relies on electricity.

DOCTORS & NURSING

- ❖ During WW1 many women became doctors and the first women's nursing unit was set up. 'The First Aid Nursing Yeomanry' (FANY) was set up in 1916.
- ❖ Doctors are highly trained and in hospitals specialise in treating special conditions (e.g. cancer) or parts of the body (e.g. Ear, Nose, Throat) or types of patient (e.g. children or the elderly).
- ❖ Nursing has also become more specialised.

INDIVIDUALS

Alexander Fleming

- ❖ In 1928 Fleming discovered a mould called penicillium that killed several different bacteria.
- ❖ Fleming realised that this mould could kill germs but he did not have the skill in chemistry to purify the mould.
- ❖ He wrote a paper on his findings .
- ❖ Between 1939 and 1945 Florey and Chain developed Fleming's work by producing pure penicillin and getting it mass produced.

Paul Ehrlich

- ❖ In 1899, Ehrlich became interested in antibodies. These were produced naturally by the body to fight specific germs, without harming the rest of the body.
- ❖ He called these antibodies 'magic bullets' ., but he discovered they didn't always work.
- ❖ He and his team looked for synthetic chemical 'magic bullets' to cure disease.
- ❖ At first his success was limited, however he later developed Salvarson 606,.
- ❖ Salvarson was the first man-made chemical 'magic bullet'.
- ❖ Ehrlich faced a lot of opposition and it was 20 years before a second magic bullet was found.
- ❖ However other hi tech drugs did follow.

Sir William Beveridge

- ❖ He was a leading civil servant.
- ❖ In 1942 he published a report in which he stated that the government should create a 'welfare state', taking charge of social security 'from the cradle to the grave.' He argued that all citizens had the right to be free from hunger, disease, ignorance, squalor and idleness. The report was a best seller and influenced the creation of the NHS in 1948.
- ❖

Anuerin Bevan

- ❖ Minister of Health who introduced the National Health Service.
- ❖ He was very influential in convincing doctors that the creation of the NHS was a positive step, brokering an agreement with the British Medical Association that led to 90% of doctors getting involved in the NHS when it was introduced.