

The first great inventions



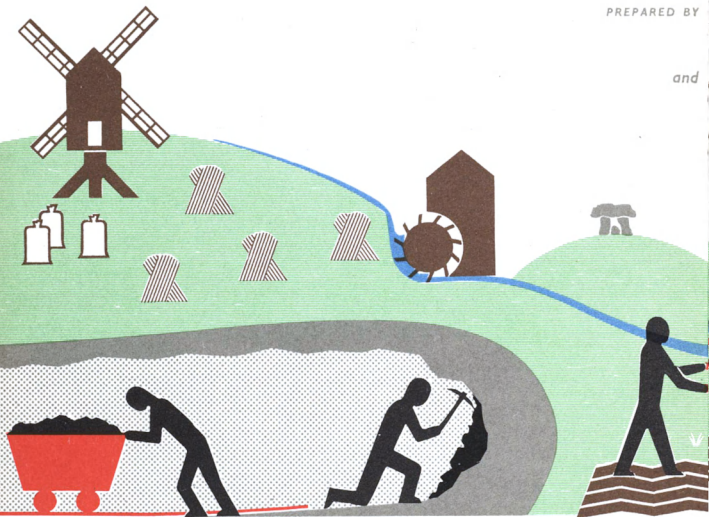
Marie Neurath and J. A. Lauwerys

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PREPARED BY

and

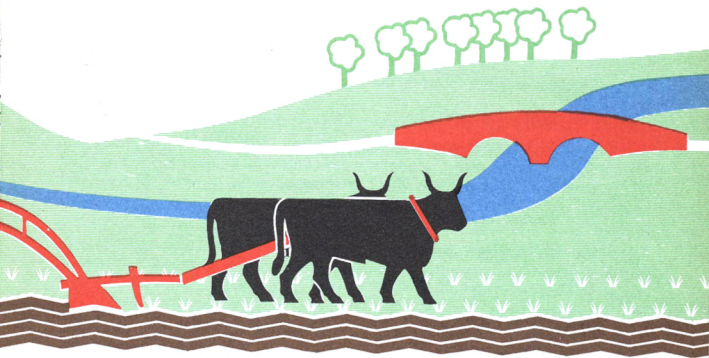


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first great inventions

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Great Inventions Made Before History Began



The first farmers drew their own crude ploughs.



Then some unknown inventor made a plough with a long shaft and harnessed oxen to pull it along.

When we think of inventors we usually imagine scientists working with test-tubes and microscopes, or engineers working in bright modern workshops. But some of the inventions we still use today were made by cave-dwellers who lived before history began. It was these early men who first learned how to make fire, how to get clothes and leather from animal skins, how to make the first crude tools of wood and flint.

After the cave-dwellers came the first farmers who used rough pointed

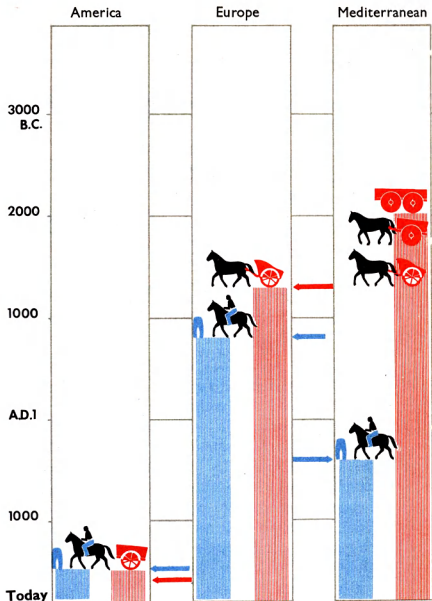
sticks to dig the ground. In time they invented wooden hoes and hand-ploughs which they pulled over the fields themselves.

Then, more than five thousand years ago, some unknown inventor in ancient Egypt made a plough with a long shaft to which a pair of oxen could be harnessed by means of a cross-pole fixed in front of their horns. The invention of a harness meant that animals could now be used not only for carrying loads, but also for pulling things.

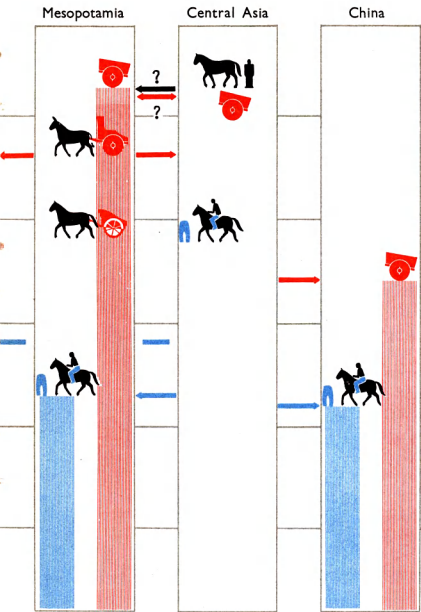
How the Wheel Travelled the World

Perhaps even earlier than this, one of the greatest inventions of all ages was made in or near Mesopotamia—the wheel. Historians have dug up wagons with solid wooden wheels, made between five and six thousand years ago. Some had shafts and were drawn by oxen or asses.

Meanwhile, on the prairies of central Asia horses were being tamed, and about four thousand years ago some were taken to Mesopotamia, probably by invaders from Persia. The people of Mesopotamia found that horses were swifter than oxen and stronger than asses. Gradually they began to replace both. Light vehicles were made using spoked wheels instead of



Carts were used in Mesopotamia 5,000 years ago. In time



horses were harnessed to them. Riding began later, in Asia.

solid wheels, and people travelled faster and farther.

The eastern Mediterranean lands—Syria, Egypt, Asia Minor—soon began to breed their own horses to draw chariots, but for many years they used solid wheels, like their own potters' wheels. Soon after the days of Abraham, horse-drawn chariots were used in most parts of Europe, and the invention of the wheel had reached China. There, solid-wheeled wagons were used, as they often are even today. The highly civilized peoples of central America had no working animals and no wheeled vehicles until the Spanish invaders brought horses and wagons across the Atlantic about the time of Columbus.

In most parts of the world men learned to drive horses long before they could ride them.

Wonders Worked by Wheels

Before the invention of the wheel, people had two main ways of making pottery. Sometimes they took a ball of clay, pressed a deep hole into it with the fist, and then modelled the walls of the clay to the shape they wanted. Sometimes they took a long, thin strip of clay and wound it round and round in a spiral until it formed the shape of a rough pot. Usually when people were making pots by hand, they rested the clay on a large flat stone.

About five thousand years ago some inventor in the lands near the eastern Mediterranean rested his clay on a solid, flat wheel, and set it spinning as he modelled. He found that as the clay whirled round against the curved palm of his hand it could be shaped very much faster, and when finished his vessels were more regular in shape than ever before.

More than two thousand years went by after that before men began to use stone wheels for grinding corn into flour. Early men ground corn



by laying the grains on a flat stone and pounding them with a large round stone. Then, between two and three thousand years ago, somebody



Early potters used only their own hands to model lumps of clay into bowls or jugs. Later they learned to rest the clay on a solid, flat wheel which they turned as they modelled. That way they could work faster and also make better shaped vessels.

thought of the idea of grinding corn between two revolving wheels. This invention seems to have spread rather slowly, but after a time the Romans

began to make great strides in the art of milling. About the time of Christ, a Roman described how a water-wheel might be used for turning millstones, but it was twelve hundred years later before watermills were in common use in Europe.

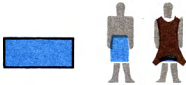
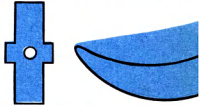
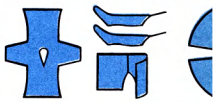
In most parts of the world spinning and weaving were both often done without wheels until a few centuries ago. Fibres which were to be spun into thread used to be loosely rolled round a stick called a distaff. Some of these fibres were twisted together between finger and thumb to form a thread, which was fixed to a weighted stick called a spindle. The spindle was hung from the spinner's hand and set whirling round. As it turned it twisted more and more of the fibres from the distaff into thread.

For weaving, large wooden frames were used. The many parallel threads which were to form the "warp" of the cloth were stretched from top to bottom. The thread to form the "woof" was moved backwards and forwards across the frame by means of a stick called a shuttle, going first over and then under every other upright thread.

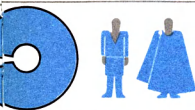
Clothes from Plants, Animals and Coal

The first clothes were made from the skins of animals, stretched, cleaned, dried and cut roughly into shape. Flax and wool were probably the next materials used; the first flaxen and woollen clothes were woven before the ancient Egyptians built the great pyramids. Early clothes were usually cut very simply—a square to serve as a kilt or an oblong as a loose cloak. Sometimes the cloth was cut into a long, narrow cross. Folded in half and stitched together, this made a kind of jersey with sleeves and a hole for the neck.

After trade had grown up between Europe and China, Chinese silk was used to clothe the wealthier Roman citizens. The graceful Roman cloak, or

	Materials	Garments
Primitive		
Pre-Roman		
Roman		
Medieval		
Modern		

Clothes were first made of animal skins. Later on, men learned to weave clothes from the stems of the flax plant,



the fleece of sheep, and silk from silkworms. Today we wear many clothes, but they are light and comfortable.

toga, was made from a large circle of cloth or silk. During the Middle Ages clothes became more complicated in design, but no new materials were used, and buttons were still unknown.

About four hundred years ago, people in Europe began to use a material which the people of India had been using for four thousand years—cotton. Now America supplies cotton to more than half the world. In the past few years scientists have given us rayon from wood and nylon from coal. Threads of rayon and nylon are made by squeezing pulp, under great pressure, through very fine holes.

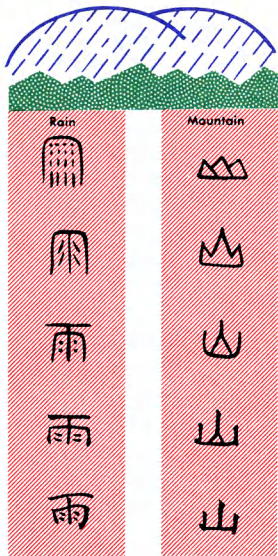
Although people now wear more different garments than ever, they are lighter and easier to move about in than the clothes of earlier times.

When Men Found Pictures for Sounds

There is one great invention of early times which you are making use of as you read this book. It is the invention of the alphabet, which makes it possible for us to read and write thousands of different words with only twenty-six different letters.

Writing is a way of saying something without actually speaking, and perhaps the first step towards learning to write was made by the cave artists of thirty thousand years ago. The cave-dweller who painted a bison probably did so to bring good luck to his tribe next time they went hunting. But his picture did say something to people who saw it. It said something like this: "A bison has a large head with two horns, a stout body, and four rather small legs."

Thousands of years later, when men began to grow crops, most villages had priests or wise men to foretell the seasons for sowing and reaping and to offer prayers and sacrifices to the God of Growing Things. These priests had many



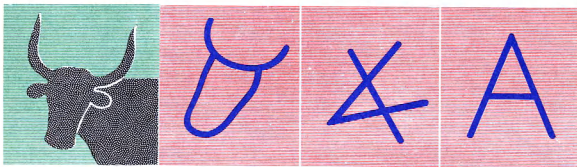
The Chinese use a separate picture for each word. Here you see how the pictures for "rain" and "mountain" have changed from early times until today.

things to remember. How many days had passed since the last corn was sown? Was a certain young farmer yet old enough to be told the secrets of the clan? How long was it since the chief man of the village had brought a lamb for sacrifice or a tribute of corn to the temple? To remind them about many of these things they began to scratch rough drawings on wood, clay or animal skins, and in time each little drawing came to have an exact meaning which other priests could understand.

In this way picture writing gradually grew up in Egypt, Mesopotamia and India more than five thousand years ago. Between three and four thou-

sand years ago the people of China also began to use picture writing and even today the Chinese still use a separate picture for almost every word in their language.

In some of the eastern Mediterranean lands people began to write in a new way. Instead of using a different picture or sign for each word or each idea, they used a different sign for each *sound* in their language. Then, between two and three thousand years ago, probably in or near Syria, the Semitic peoples invented a writing which used one sign for each consonant. That was the first true alphabet, and from it have sprung all the alphabets of the world.



The letters of our own alphabet have also changed. The early Phœnician "A" looked like a bull's head. Later, the people who lived near Suez made a simpler "A" of three straight lines. The Greeks and Romans wrote it as we do today.

How the World Learned to Write

Slowly the art of writing has found its way to almost all parts of the earth.

From Syria the new way of writing spread to ancient Greece, and the Greek alphabet, together with its near relation, the Russian alphabet, is now used in eastern Europe and central Asia. The Romans copied sound writing from the Greeks, and as their empire grew the Roman alphabet came into use all over western Europe. When the great age of discovery began five hundred years ago, the people of Europe carried the Roman alphabet to new lands across the seas—North and South America, South Africa, and Australia.

Some two hundred years after the Roman Empire

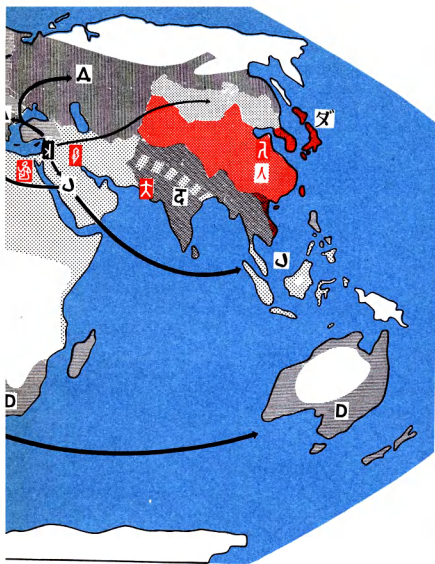


 Picture writing

 Semitic alphabets (inc. Arabic)

 Greek alphabet

The alphabet, invented near Palestine, has spread all



 Roman alphabet

 Indian alphabets

 Alphabets based on Chinese writing

over the world. Only China now uses picture writing.

crumbled, the Arabs began to build a new empire which spread over most of north and east Africa, and much of southwest Asia. In those lands people used the Arabic alphabet. The Moslem religion of the Arabs spread farther still, to the north of India, to parts of Mongolia and to many of the islands of southeast Asia. There, too, people used the Arabic alphabet which was the alphabet of the sacred Moslem book, called the Koran.

In time, the old picture writings of Egypt, India, and Mesopotamia were used less and less and almost forgotten.

But in China picture writing remained, and the people of Japan have borrowed many of the Chinese pictures, some to stand for sounds and others to stand for words.

Finding the Buried Treasure of Coal

We have seen that many different people and many different ideas played a part both in inventing new uses for wheels and in making our alphabet. Perhaps even more people and more ideas were needed to bring about all the inventions connected with coal and coal-mining.

The first people who made fires could get all the fuel they needed by cutting down trees or branches with their stone axes. Later, when men smelted metals to make tools, they made charcoal to heat the furnaces.

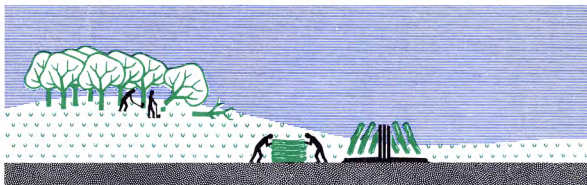
Wood and charcoal remained the two main fuels for many centuries, but here and there people began to use coal as well. An early Greek author tells us of blacksmiths in southern Greece and along the northern coast of the Adriatic Sea who were already using coal in their forges.

The Greeks and Romans did not have to dig their coal from deep mines. In several parts of Europe the end of a coal-seam, called an outcrop, comes almost to the surface of a hillside, and along the northeast

coast of England lumps of coal are often washed ashore by the sea.

Usually it didn't seem worth while to go to the trouble of mining coal except in places where most of the forests had been cleared to make room for fields or towns, or where it was needed for some special industry. When the time came to make coal-mines there were already many mining engineers who knew how to make them. Mining had been invented thousands of years earlier, when people first dug pits and tunnels in the earth to get supplies of flint. Later, more mines had been sunk in many parts of the world to find the ores of copper, tin and iron.

The first coal-mines were begun by cutting into an outcrop of coal on a hillside. More and more coal was hewn away until a tunnel was made beneath the hill, following the line of the coal-seam. As the tunnel cut deeper into the hill, its roof and sides were strengthened with stout wooden pit-props to prevent them from collapsing under the tremendous weight of the soil above.



These men make a smokestack of turf and build a large pile of logs around it. They set light to the bottom logs and cover the whole pile with more turf. The fire burns slowly and turns the wood into charcoal for their furnaces.

Changes in Work Beneath the Earth

Until about five hundred years ago coal was little used except by blacksmiths, lime-burners, brewers and dyers. Then it began to be used for purifying salt and occasionally to warm houses. Later, when more and more people had glass windows in their homes, glass-makers needed coal furnaces to make glass.

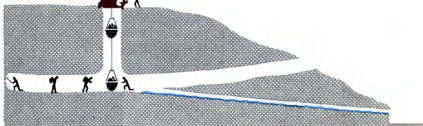
After about 1750, when timber had begun to get scarce in many parts of Europe, coal was used for the new blast furnaces and factories which were growing up. Soon still more coal was needed for the newly invented steam engines and gasworks.

The first small tunnels cut into hillsides were no longer able to supply all the coal that was needed.

1200-1400



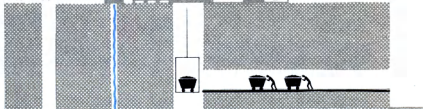
1400-1600



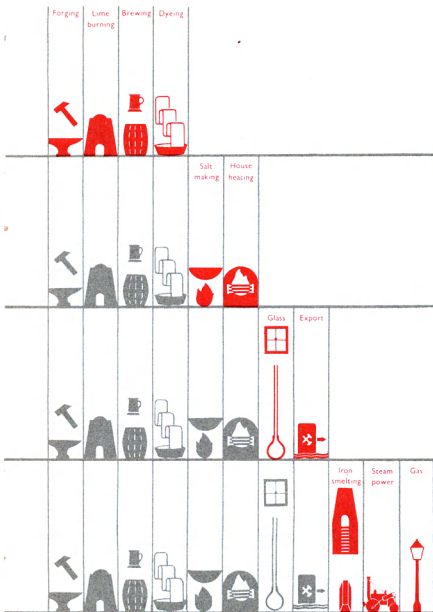
1600-1750



After 1750



Coal was first cut from hillsides. Now that more coal is



used, deep mines are cut and machines used to haul it.

Soon after 1400, hillside tunnels were cut deeper and buckets and windlasses were used to haul coal to the surface. Later, deep mine-shafts were sunk beneath the level ground to find the rich coal-seams beneath. Coal was pulled along the tunnels in trucks which ran on rails. Until steam-powered lifts were invented, more than a hundred years ago, it was hoisted by ponies.

As these changes took place, new ways had to be found to drain off the water which always collects underground. At first the water simply ran down the hillside; then as the tunnels were made deeper, special drainage channels had to be cut. In mines under level ground, water was at first hauled up in buckets, but later steam engines were invented to pump it out.

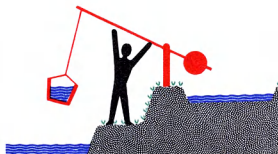
The Mighty Power of Steam

The invention of the steam engine was soon to change the lives of millions of people all over the world.

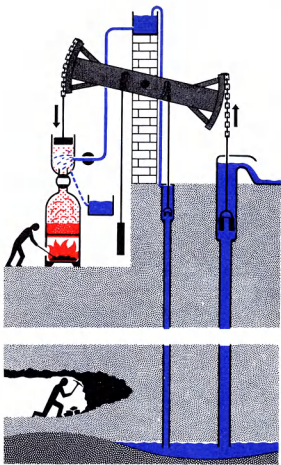
Before the age of steam began, most of the world's work had to be done by men and animals. Most, but not quite all. The ancient Egyptians had fitted masts and sails to their ships so that the strength of the wind could help the rowers, and later the Phœnicians built sailing-and-rowing ships that could carry them the whole length of the Mediterranean.

Then, more than eight hundred years ago, some unknown inventor made the first windmill, and soon the millers of Germany and Holland were using the wind's strength to grind their corn. In many parts of Europe, too, water wheels were used to work mills.

About 1700 the first steam engine which could do a really useful job was invented. It made steam to create pressure which could be used for drawing water up from the mines. Some sixty years later, James Watt,



The ancient Egyptians used levers to help raise water from the river to their fields. When the vessel was full, the heavy ball at the end of the short arm of the lever helped to raise it.



From the boiler of this early steam engine, a large volume of steam passed through a valve into the vessel above. There it was cooled, and turned into a small volume of water. This caused a vacuum which pulled down one end of the beam. The other end was raised and drew up water from the mine.

a Scotsman, invented steam engines not only for pumping water but also for turning wheels to drive various simple machines.

Other engineers began to have visions of making wonderful engines which would turn their own wheels and move along without the help of horses. From 1800 onwards the first locomotives began to be made, but it was not until 1814 that a really powerful one was produced by George Stephenson. Now, less than a century and a half after, railway trains are running over nearly a million miles of track in all parts of the world!

Steam was very soon put to work on water as well as on land. In 1786 James Rumsey made a trip on the Potomac River in a small boat driven by a power-pump, but his speed was only four miles per hour. Sixteen years later, in Scotland, a more successful boat was built using steam-driven paddle-wheels. Soon paddle-steamers, including Robert Fulton's famous *Clermont*, were plying along many of the rivers and narrow strips of sea in America and Europe, most of them carrying sails as well.

Inventions that Changed the Countryside

In many lands the whole countryside was changed by the inventions which followed the steam engine.

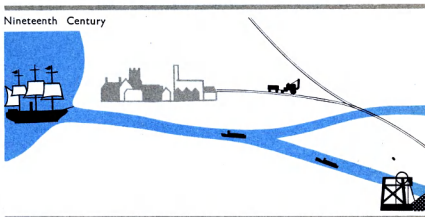
Before 1800 there were not many large cities, and none as big as London or New York. Most of the bigger towns were near the sea, or on the banks of a wide river, where sailing ships could easily bring supplies of food. Nearly all the fuel needed was still cut from forests, and some of the wood was made into charcoal for the few foundries and blast furnaces. Most trades were carried on by hand, and only here and there a mountain stream was used to turn the wheel of a sawmill or flour-mill.

By 1850 steam engines were driving machines to do spinning and weaving,

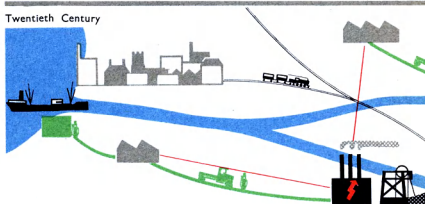
Eighteenth Century



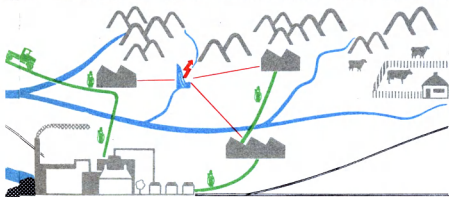
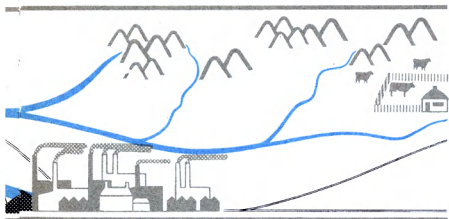
Nineteenth Century



Twentieth Century



Two hundred years ago ships were moved by the wind, and mill wheels turned by water. Later, steam was used to

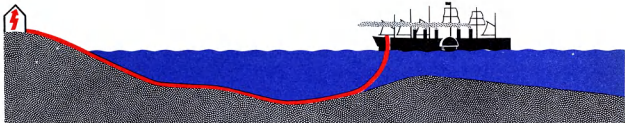


drive ships, railway engines and machinery. Today we use petrol engines and electricity to help do our work.

metal-working, printing and scores of other trades. Near the coalfields which fed the boilers of the new engines, huge, smoky factory towns grew up. Often they were far inland, and canals were cut and railroads built to carry supplies to them.

Since that time new inventions have brought still further changes. Most machinery is now driven by electricity, and there are fewer smoking chimneys in our cities. Electricity can be taken to the countryside more easily than coal, and often new factories are built some distance from the towns.

People can make long journeys from their homes to work in fast cars and buses, so there is no longer any need to crowd houses around factories. Much of our food is carried in lorries, and many canals are seldom used.



How Men Found Three Giant Helpmates

Once men had harnessed the power of steam they soon learned to make coal-gas, mineral oil and electricity work for them too.

Perhaps the first man to make and use coal-gas was William Murdock. Murdock first began experimenting with coal about 1790. He found that when coal was heated in a closed space, in the same way as the charcoal burners heated wood, it gave off an invisible gas which burnt with a bright, warm flame. Later he installed a small coal-gas plant to light his cottage. Within the next fifty years huge gasworks grew up in many parts of Europe and America, and the streets and houses of most large towns were lit by gaslamps.

It took many years to learn how to make use of electricity. More than two thousand years ago the ancient

Greeks had noticed that when a piece of amber or jet was rubbed briskly it had the power to lift small feathers or scraps of straw. (The word "electric" is borrowed from the Greek word "electron", meaning amber.)

About two hundred and fifty years ago scientists of many lands began the long struggle to learn how to control and use the great power of electricity. The first important invention to make use of electricity was that of the telegraph, made in 1836, and twenty-five years later the first telegraphic cable was laid across the Atlantic, linking America and Britain. A few years later electric dynamos and motors were invented, and not long afterwards the first electric lights were switched on.

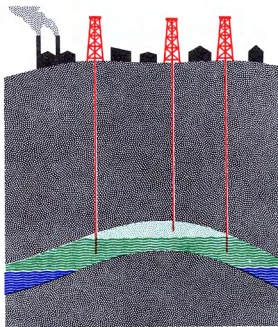
In those parts of the world where crude oil lies not far below ground



To carry the new electric telegraph messages across the Atlantic nearly ninety years ago, metal cables were laid along the ocean bed from Europe to America.

level, people have dug shallow oil wells for several hundred years, but it is less than a century since deep wells were sunk to find the vast supplies of oil far beneath the earth's surface. In 1859 "Colonel" Drake made the world's first deep oil well in Pennsylvania by using a large, chisel-shaped tool to punch a hole nearly seventy feet deep. Since that time mechanical drills have been used to bore thousands of wells, all much deeper than Drake's, in America, Persia, Russia and Rumania.

From 1820 onwards many inventors tried to make petrol-driven engines, and about fifty years later a German inventor named Otto succeeded. Now millions of petrol engines are driving planes, cars, buses and ships all over the world.



This oil is trapped between two upward-curving layers of rock. There is water below it and natural gas above. The centre bore draws off the natural gas and the outer ones the oil.

New Lamps for Old

Before mineral oil, gas and electricity were brought into use, the lighting of men's homes had changed very slowly through the long centuries. The first men who lived on the earth had no way of making light. When darkness began to fall they found shelter and lay down to rest until dawn broke once more. After many thousands of years, men learned to make fire, and at night burning torches flared and smoked in their caves.

Long before the first letter was written or the first wheel made, somebody invented the wick and the lamp. These primitive boat-shaped lamps were usually fashioned from clay and filled with animal fat. The wick was probably made from some kind of

TORCHES



FAT



OLIVE OIL



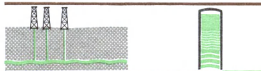
CANDLES



WHALE OIL



MINERAL OIL



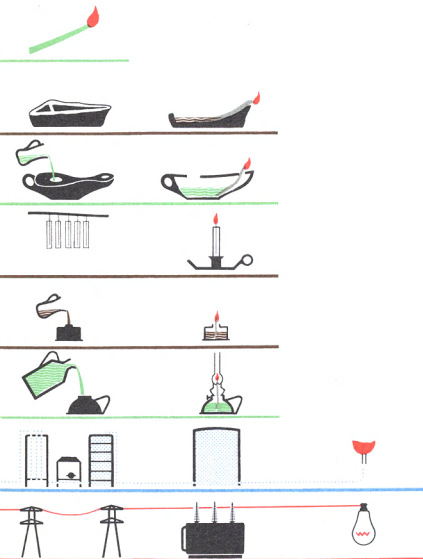
GAS



ELECTRICITY



Years ago men made lights with wood or oil from plants



and animals. Now we use mineral oil, gas and electricity.

vegetable fibre. But lamps were rare until the time of the Greeks and Romans, who made many beautiful ones of clay or bronze, which were filled with olive oil and supplied with wicks of twisted flax or cotton.

Not very long afterwards candles, too, were made. A number of long wicks, hung from a stick, were dipped several times into melted fat or beeswax which gradually formed a thick coating round them.

Lamps were first filled with whale oil about the time of the *Mayflower* when seamen began to hunt sperm-whales in the Arctic seas. Later came mineral oil, used in lamps which could be regulated to give a dim or bright light.

From about 1830 to 1900 the yellow flame of the gas-jet was used in more and more homes, until that, too, had slowly to give place to the new electric lighting.

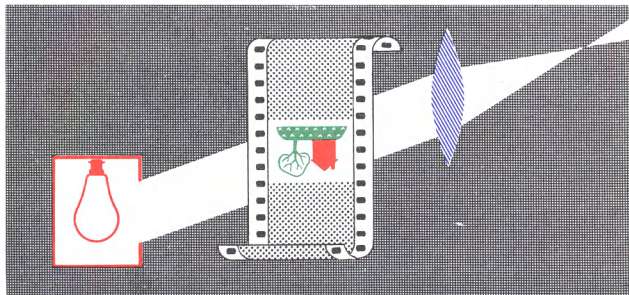
Marvels of Light and Sound

Within the last hundred and fifty years inventors have not only given us better lighting; they have also learned to use light to make pictures.

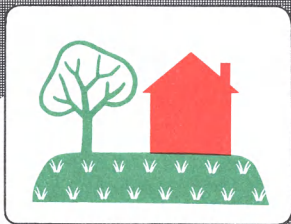
During the time of Napoleon, a Frenchman named Niepce discovered that a substance called asphaltum would dissolve in certain liquids after it had been kept in the dark, but not after light had fallen on it. He found that by coating a glass plate with asphaltum

he was able to make the first photographic negative. Where very little light had fallen on the glass plate, the asphaltum could be dissolved and washed off. Where more light fell the asphaltum would not dissolve, and left a dark patch on the plate.

Some years later, celluloid film was used in place of glass for photography. Later Edison used a long roll of celluloid film to take a number of fast pic-



The pictures are run through a film projector upside down. A lens turns them the right way up, magnifies them, and brings them into focus on the screen.



tures, one immediately after the other. By using this roll in a projector rather like the magic lanterns of those days he was able to show the world's first moving picture on a screen.

Some years earlier Edison had made another important invention, connected with sound instead of light. Scientists had known for many years that different sounds set the air moving in different ways. Edison used these sound-vibrations to move a sharp needle which cut marks into a spiral groove

running round a moving wax cylinder. In this way he made the forerunner of the modern gramophone record.

In the same year, the American scientist Alexander Graham Bell made the first telephone. People had been using the electric telegraph to carry the dot-and-dash sounds of Morse code for about forty years. Bell's aim was to make a current of electricity vary in the same way as the air varies when sounds are made, so that he could send the sound of human voices by electricity.

A Hundred Years of Inventions

Recent inventions have changed life so much that a man of today would feel very strange if he had to live as his great-grandfather, his grandfather, or even his father lived.

A hundred years ago, for instance, bicycles had no pedals. The bicycle of seventy years ago had a large front wheel, with pedals fixed to its hub, and a small back wheel. It was some years before modern bicycles, invented more than sixty years ago, became common.

Seventy years ago, telephones were fitted with a handle for ringing the exchange. Later came phones which rang automatically when the receiver was lifted from a hook. The dial telephone came into general use twenty years ago.

Clothes



1850



1880



1910

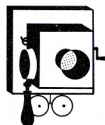


1940

Cycles



Telephones



A hundred years ago there were no bicycles like those we know today, no telephones, no aeroplanes. These and

Aviation



many other inventions have completely changed the way in which people live.

In flying, the last century has brought even greater changes. Balloons were first sent up in 1783, when two French brothers named Montgolfier made a large globe-shaped linen bag with a hole in the bottom. They lit a fire under the hole, and as the air inside the bag became hot their balloon rose, because the hot air inside was lighter than the air outside.

Within a few months other balloons were made and filled with hydrogen, a lighter-than-air gas, and people were soon making the first balloon ascents. But for many years balloonists could go only where the wind blew them, and it was not until 1900 that Count von Zeppelin made the first successful petrol-driven and hydrogen-filled airship. Airships were often used to carry passengers until about 1930, when they were gradually replaced by planes. Balloons are seldom used today except for observing weather conditions at high altitudes.

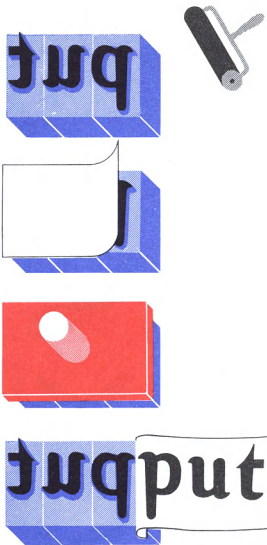
Modern flying really began in 1903 when Wilbur and Orville Wright of Dayton, Ohio, fitted a glider with a propeller and an engine. In 1905 they flew nearly twenty-five miles in half an hour. Thirty-five years later, fighter planes roared into battle at four hundred miles an hour; now jet planes can travel faster than sound.

How News Travels Faster than a Jet Plane

Although a jet pilot can travel three hundred times faster than the first men, who walked barefoot from place to place, there is something else which travels many times faster still—news. If there is an earthquake in Japan we read about it in our newspapers or hear about it on our radios within a few hours, or even a few minutes. Yet sixty years ago there were no radios, two hundred years ago no daily papers, six hundred years ago no printed books.

Until after 1400 every book had to be made by hand. Scholars and monks worked long hours writing with quill pens on sheets of parchment which were finally hand-bound in leather.

Then, some time before 1400, a Chinese invention many hundreds of years old came into use in Europe. The Chinese had carved patterns on flat blocks of wood and smeared them with ink made of gum, lampblack and water to stamp designs on silk. Later, having learned to make paper, they used wood blocks to print the designs on playing cards. In the fourteenth



The inside-out type is inked, and a sheet of paper pressed on to it. When the paper is raised the letters are printed on it the right way round.

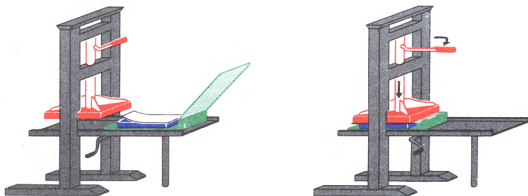
century card games became very popular in Europe, and the same method of printing was used. Many of these old playing cards showed pictures of knights, and often the name of the knight was carved on the wood block.

About 1450, a German named Gutenberg made separate little blocks for each letter so that they could be arranged to form any word or sentence needed, and used over and over again. So the art of printing began. In a few years it was in full swing in many parts of the world.

Up-to-the-minute newspapers did not become possible until many years later when there were electric telegraphs to bring news swiftly, steam engines to

drive printing presses, and machines to set up type rapidly.

In 1864, before the first successful type-setting machines were produced, a Scottish scientist named Clerk Maxwell showed that electric power could be turned into waves which travelled as fast as light and passed through many materials—through the air, for instance. Other scientists worked to find out more about these waves, and in 1895 a young Italian inventor, Marconi, found that he could use them to telegraph a message more than a mile without wires. Marconi went on improving his apparatus, and in a few years news could be flashed right round the world by radio.



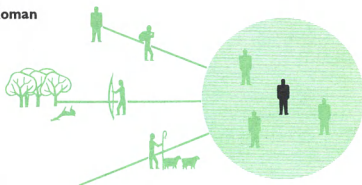
Inked type and paper are placed on the “bed” of this printing press. A lever is pulled, and a large block presses the paper firmly on to the type.

Getting to Know

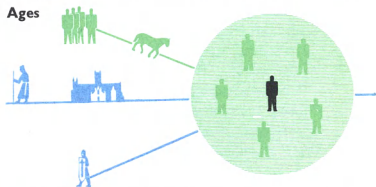
Printed books, newspapers and the radio gave people three new ways of getting to know about the world around them.

People who lived in the first farming villages, thousands of years ago, had few chances to learn what was going on outside their own settlements. Sometimes a shepherd or herdsman who had taken his flocks or herds to graze in distant pastures would return with stories of strange peoples and strange customs he had met with. More rarely, some early trader carrying a bundle of goods brought up from the coast would tell wonderful stories of ships with large sails, carrying cargoes of grain or spice and manned by seafarers who spoke a language he could not understand.

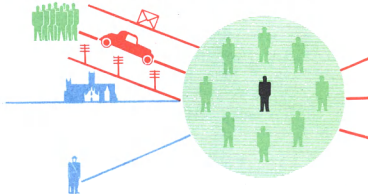
Pre-Roman



Middle Ages



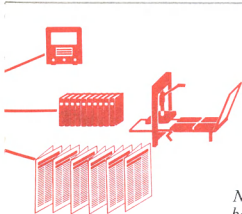
Today



In each of these strips, the black figure in the green circle stands for a stay-at-home kind of person. In early times stay-at-homes could learn about the outside world only by listening to the stories of wandering traders, hunters, herdsmen and shepherds.



Five hundred years ago they could learn from priests, from soldiers who had fought in the religious wars, and from written books.



Now they have newspapers, books, radio, swift mails and cables to bring news.

Five or six hundred years ago, in the walled towns and well-settled farmlands of Europe there were few real hunters and no wandering shepherds to carry news. But there were many pilgrims who learned about other lands by visiting Rome and other great religious centres. Knights and soldiers, too, went to Palestine to fight against the Mohammedans, or Moslems, and many must have returned with tales to tell about the fine buildings and great learning these people had.

Today the Church still supplies some of our news, through missionaries, and travellers or soldiers serving abroad still have tales to tell us. But we also have fast mails, the telegraph, newspapers and the radio to keep us informed. There are printed books which all can read and which all can afford.

The Inventors of the Future

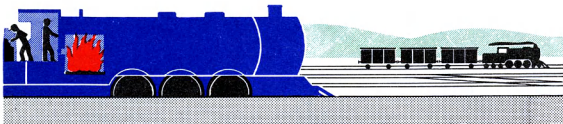
The long story of inventions which began way back in the caves, many thousands of years ago, is certainly not ended yet. At this very moment scientists, doctors, engineers, chemists and electricians all over the world are experimenting to find new drugs to save life, new ways to add to our comfort and enjoyment, new sources of energy to turn the wheels of the world.

Nobody can tell exactly what new wonders they will give us tomorrow and in all the tomorrows which will follow. Some of these new inventions,



Fire is a destroyer!

like the bows and arrows, swords, guns and bombs of earlier times, may have the power to kill and destroy. But if men throughout the world can learn to live together in peace, the inventors of the future will use the power from the atom to do new miracles of work for us, just as the earliest inventors long ago harnessed the power of the great destroyer, fire, and made it one of men's most valued helpers.



The inventors of the past harnessed fire to work for men. The inventors of tomorrow can also use the power of the atom to serve men.



A PARRISH COLOUR BOOK FOR CHILDREN