



# CHILDREN'S BRITANNICA

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BEECH—BUILDING



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# Children's Britannica

**BEECH.** This handsome tree belongs to the Fagaceae family, which also includes the oak and the chestnut. It has a smooth, grey-green bark and reaches a height of 30 metres with a trunk 2 metres across, but sometimes it is cut and made into a hedge. It is a deciduous tree; that is, the leaves fall in the autumn. The common beech first appeared in southern England between 1000 and 2000 B.C. and it became the commonest tree of the chalk uplands, for the roots can take hold on quite shallow top soil.

Only a very few plants can grow in a beech wood, because the thick canopy of leaves keeps out the light and the roots of the trees spread out and take up the moisture. There are, however, two plants that grow on decaying beech leaves—the bird's nest orchid and the yellow bird's nest—and there is a special fungus that grows among the roots of the tree and helps them to absorb moisture.

The pale green young leaves have long silky hairs. Male and female flowers grow on the same tree and the fruit is known as beech mast—three-sided dark brown nuts which fall from their prickly husks in the autumn.

Beech wood is used for chair making and tools and, in some parts of western Europe, for the shoes of the peasant and farm worker. An oil produced from beech mast was sometimes used

for butter, while dry beech leaves were once widely used to stuff pillows and mattresses.

The beech has a place in legend, history and superstition. One legend is that the first beech tree was stolen from heaven and brought to the Earth by an Indian hero named Arjuna. Joan of Arc is supposed to have seen visions under a

beech tree. The leaves of the beech provide one of the most beautiful bronze browns in nature's autumn pageant of colour but—and this is the superstition—a famous 16th-century herbalist named Gerard warned his readers against taking the leaves into the house in case they brought death with them.

The copper beech, often grown in parks and gardens because of the beautiful colour of its leaves, is a variety of the common beech. Other cultivated beeches came from Europe, North America, China and Japan.

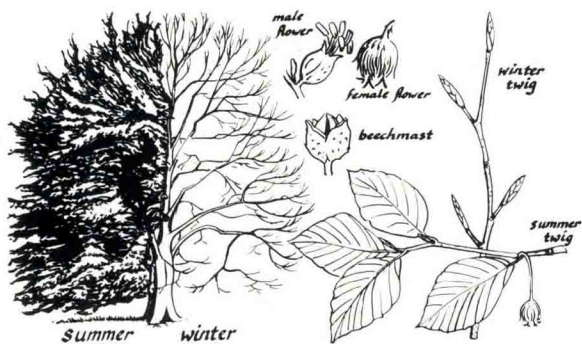
**BEE-EATER.** Among the most brilliantly coloured and graceful birds of the eastern hemisphere are the bee-eaters. The cock and the hen of the common bee-eater are alike, with chestnut backs, yellow throats and greenish-blue underparts. They are about the size of a blackbird, but more slender. Their bills are long and pointed and their tails are also long, with the two middle feathers longer than the others.

These birds live on insects—chiefly bees, of course, and they can be a great nuisance in places where there are beehives. They also eat wasps and dragonflies, and often they hunt for insects in the air, gliding about like swallows. They like to perch on dead boughs, telegraph wires or posts, darting off to catch a fly and then back to their perch again. They have a queer, single note which they keep on repeating.

Usually, bee-eaters keep together and nest in colonies. They dig out a tunnel in a soft sand-bank, throwing the sand backwards with their feet as they peck it out. These tunnels can be 2 metres long and there is a round nest chamber at the end. The hen lays her five or six white eggs on the bare sand.

During the summer common bee-eaters are found in southern Europe from Spain to Bulgaria. Now and again an odd bird visits Great Britain and two pairs nested in Sussex in 1955. In the autumn they migrate in large flocks to Africa and India.

There are many different kinds of bee-eater. Most of them are found in Africa and one of these, the carmine bee-eater, often rides on the backs of large birds like bustards and storks, jumping off to catch the grasshoppers and other



No forest tree has richer foliage than the beech.

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*S. C. Porter-Bruce Coleman Ltd.*

The common bee-eater often chooses to perch on a dead bough while waiting to catch insects.

insects they disturb. It has also been seen to follow lorries, catching the insects that are disturbed by their passing. There is an Australian bee-eater, which is sometimes called the rainbow bird. Bee-eaters are close relatives of the kingfishers.

**BEE-KEEPING.** Wild honey bees, living in hollow trees or holes in buildings, usually make only small nests in which to store sufficient honey for their own use during the winter. In very early times bee-keepers kept their bees in hives made of wicker or in hollowed out logs, and later in straw baskets called "skeps", but in all such hives the bees fixed their combs to the hive walls and the honey could not be taken out without harming the colony. At the end of the summer it was then the custom to select the heavier skeps, kill the bees with sulphur fumes and then cut out the combs and press the honey from them; good use was also made of the beeswax. In the following year the bee-keeper filled the empty skeps with swarms from the remaining colonies.

Modern hives are larger, so that the bees have room to store honey for the bee-keeper as well as for themselves. They are made of wood and are divided into separate compartments—one called the "brood chamber" where the queen bee lays her eggs and others above it called "supers" for the storage of honey. In all the compartments the bees are provided with wooden frames across which are stretched foundations for the cells; that is, thin sheets of wax stamped with the shape of the cells. Then the bees have only to make wax to build the cells outwards on both sides of the foundation sheets. This wax is not gathered by the bees but formed by them in their own bodies out of honey and used for building the comb.

No doubt the bees appreciate the fine home provided for them, but they still object when the bee-keeper removes the roof of the hive to take their honey. To avoid stings, which can be painful, the bee-keeper must be able to quieten the bees when he attends them. To do this he makes use of an instinct which the bees developed a long time ago when, on smelling the smoke of the dreaded forest fire, they filled themselves with honey so that they were ready to leave for a new home. The bee-keeper uses a "smoker", which is a kind of bellows filled with burning sacking or similar material. By puffing smoke into the top of the hive he drives the bees to fill themselves with honey and this honey makes them feel good-tempered, so that he can then handle them with no more than an occasional sting. Most bee-keepers take the added precaution of wearing a veil; this is draped over a broad-brimmed hat so that the material is kept well away from the face. Some use gloves also, but these are rather a hindrance in handling the frames and other equipment.

### The Bee-Keeper's Year

The colony of bees is small during the winter and the insects cluster tightly together for warmth on the combs of the brood-chamber, flying out only on warm days or when the sun is shining. Towards the end of January the queen begins to lay eggs and from then onwards the number of bees gradually increases. As soon as they are fully occupying the brood chamber the



*Courtesy, Australian News and Information Bureau*

A veil and "smoker" are essential tools for the bee-keeper. The brush is used to remove bees from the combs.

bee-keeper adds a "super", putting below it a metal frame which has slots through which the worker bees can pass but the larger queen cannot. This means that the queen can only lay eggs in the brood chamber, while the workers are free to store their honey "upstairs". As the colony continues to grow in size—and it may contain 50,000 bees or more by the middle of the summer—so more "supers" are added when needed. Whenever he handles the hive, the bee-keeper always takes care to work calmly and steadily, so as to avoid knocking the framework or disturbing the bees in any way.

The honey bees' habit of swarming during the summer has been described in the article BEE. The habit may be useful to the bee-keeper if he has an empty hive to fill, for a swarm first settles on a tree or bush nearby while scouts go out to look for a new home, and this is the time when the bees can be shaken into a box or a straw skep and then allowed to run into a new hive.

However, the loss of a swarm greatly reduces the number of honey gatherers in a colony, and swarming is often caused by overcrowding. So the bee-keeper usually does his best to prevent the instinct to swarm from developing. First he must make sure that the queen has plenty of combs in which to lay eggs and that there is

enough room up above for the workers to store honey. If this fails and he sees queen-cells appearing in the brood-chamber, he must take further steps. Some bee-keepers clip the old queen's wings to prevent her from flying with a swarm, but this alone is not enough, for the first young queen to hatch will soon be ready to leave. There are many different ways of preventing swarming, too complicated to be described here, but the aim is always to prevent more than one young queen from hatching, for bees will never swarm without leaving a queen behind them in the hive.

The honey stored in the combs during the summer is at first thin and watery, but after undergoing a chemical change gradually in the warmth of the hive it becomes thicker, or "ripe". The bees then cover the cells over with a thin capping of wax to preserve it. Towards the end of the summer, when the bee-keeper sees that all the honey has been sealed up, he places a board under the lowest "super"; in the centre of this board is a hole and a metal spring, called an "escape", which allows the insects to pass downwards into the brood-chamber but not upwards again. In some countries, particularly in the United States and Canada, the bee-keeper places a cloth sprinkled with carbolic acid in the "supers", for the bees dislike the smell of this

intensely and quickly go below. The “supers”, having been emptied of bees by one method or another, can then be removed with the combs from the hive.

The next job is the extraction, or removal, of the honey from the combs. First the wax coverings are sliced off with a sharp knife; this is sometimes heated so that the wax cuts more easily. The combs are then placed in the “extractor”, a metal tank in which they can rapidly be whirled round either by hand or by means of an electric motor, until all the honey has been thrown out of the cells and collected in the bottom of the tank. The honey is strained, allowed to settle for a day or so in another tank, and then run off into bottles or tins. Finally, to make up for some of the honey taken from the colony, the bees must be fed with enough sugar syrup to last them until the spring.

When many hives are kept, the bee-keeper often moves them long distances in the summer, usually by road, to fruit orchards or to crops such as clover, lucerne or mustard, according to the time when these are in flower. There the bees do a useful job for man, quite apart from the honey they collect and the wax they produce, for, by carrying pollen from one flower to another, they fertilize the fruits and seeds of the trees and plants. In many countries in Europe the bees are taken to the moors in August so that they can gather honey from the heather. Australian bee-keepers practise what is called “migratory” bee-keeping, moving their bees from place to place to new sources of honey and taking their extracting apparatus with them.

**BEELZEBUB.** In the Old Testament Beelzebub or Baalzebub is the name of the false god or Baal of Ekron, which was one of the towns of the Philistines. The name means “Lord of the Flies”. Ahaziah, one of the kings of Israel, fell sick, and instead of praying for help to the true God, Jehovah, he sent messengers to Baalzebub to ask whether he would become well again. Knowing this, Elijah the prophet told both the messengers and the king of Jehovah’s anger at this sin, and the king died of his illness.

The enemies of Jesus Christ called Him Beelzebub, meaning that He was a devil, or

accused Him of healing sick people with the help of “Beelzebub, the chief of the devils”.

John Milton, in his long poem *Paradise Lost*, describes Beelzebub as an angel fallen from Heaven, next in power to Satan “and next in crime”. In the *Pilgrim’s Progress*, by John Bunyan, Beelzebub is a devil who lies in wait for the pilgrim Christian on his journey, hoping to kill him with arrows.

**BEER AND BREWING.** Beer is a drink made from the grains of barley and flavoured with hops. (Hops are described in a separate article.) The barley is first made into malt, and the process of making the malt into beer is called brewing. The making of beer is probably nearly as old as the growing of grain crops for food. It all started in the countries surrounding the eastern shores of the Mediterranean. Ten thousand or more years ago the men who lived there began to cultivate certain wild grasses, particularly wheat and barley, because their seeds could be used as food. This was much better than living on wild fruits and roots, for the corn could be stored and used all the year round. Grain-growing meant that the people were able to live in bigger groups because there was more food for them. In time they spread westwards over Europe and brought with them their skill in using the grain for baking and brewing. Bread made from wheat and beer made from barley are still the characteristic food and drink of such peoples as the Scandinavians, the Germans and the English.

Nowadays beer is usually made in great breweries which turn out thousands of barrels, but the process is very much the same as was carried on throughout the ages from the kitchens of Egypt to the abbeys of Europe in the middle ages. It must have been a happy accident that produced the first bread and the first beer, for both need yeast and yeast in its natural condition cannot be seen by the naked eye. (Yeast is a living substance, made up of cells so small that 4,000 of them in a row would just reach across a penny. It is described in a separate article.) Nobody could have guessed that the addition of yeast to flour before baking would produce a spongy loaf much more pleasant to eat than

bread without yeast, or "unleavened" bread; nor is it likely that yeast was deliberately added to wet sprouting barley to produce a sparkling drink.

### The First Brews

No doubt yeast's first appearance in history was when, thousands of years ago, a man drank some grape juice which had been left standing and which in that warm climate had started bubbling. The bubbling was caused by the yeast from the skin of the grape; this turned the sugar of the grape juice into alcohol and carbon

dioxide gas, a process known as fermentation. This fermented juice was the first wine.

The accident that made the first beer is not quite so simple, for beer cannot be made directly from barley. The barley must be allowed to get wet and to grow a little. This is the first part of the process of making malt. As it grows, certain changes take place inside the corn which result in its containing more sugar than the dry barley.

Probably some barley corns were left about in a damp spot and started to grow or "germinate" as all seeds do if they are kept warm and wet. They must then have been crushed in water so that the sugar from the inside of the corn was dissolved in the water. Yeast from the outside of the corn started the fermentation and produced the first beer.

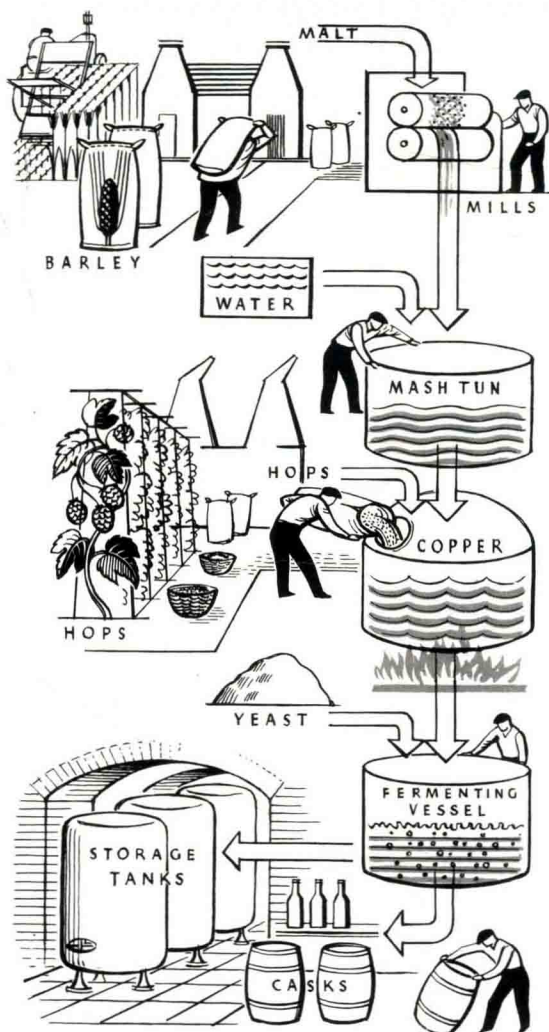
This beer had no hops in it. Throughout the centuries various herbs and other flavouring materials were put into beer but it was not until the 14th century that hops became commonly used. Even then for many years in England hops were not always used; the word "beer" was kept for the hopped variety and unhopped beer was called "ale".

### Beer and Brewing Today

Today the name "beer" is applied to all kinds of beer, the chief types being pale ale, mild or brown ale, stout, Burton or strong ale, and lager. Sometimes in Europe and America the word "ale" is used for the English type of beer and "beer" is kept for the European type—called "lager" in Britain—which has less hops in it and is made somewhat differently.

The first step in making beer is changing the barley into malt at "maltings", which are usually in the country near the barley fields. After the barley has germinated, the malt is dried in a kiln. It is then brought to the brewery where it is crushed between rollers and mixed with hot water in a large circular vessel called a mash tun. Sometimes small quantities of other grains such as maize or rice are used; these are not malted but are specially treated before being added to the mash tun.

In this vessel the changes which started in the maltings continue until nearly all the contents of the barley corn have been changed into sugar.



Stages in the brewing of beer. Malt made from barley is crushed and mixed with hot water in the mash tun. Liquid from the mash tun is then boiled with hops in the copper and fermented with yeast in the fermenting vessel.

## BEET

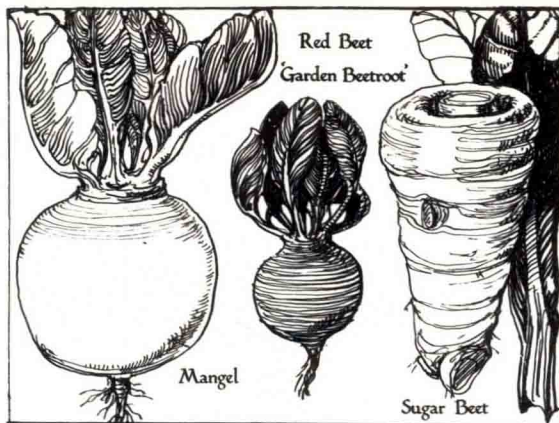
This is not quite the same sugar as that sold in the shops but is very similar and is called "maltose". The maltose and small quantities of other substances dissolve in the water, which is now called "wort". This is then run off from the mash tun and boiled in a copper for one or two hours with hops. After this the hops are strained off, the hopped wort is cooled and yeast is added to start the fermentation. This continues for three or four days during which the yeast grows and multiplies.

Much of this yeast collects in a "head" on the top of the beer and is skimmed off; part is kept for the next fermentation and the rest sold for animal feeding or for making into soup, for yeast is a very valuable food. When the fermentation is complete the beer is allowed to settle for three or four more days and is then run into casks or storage tanks, where it is kept for various periods according to the type of beer and whether it is to be sold draught or bottled. Draught beer is sold to the customer straight from the cask.

The various kinds of beer depend on the mixture of malts used and different treatment throughout the course of brewing. Dark beers are made with malts which have been heated more strongly than the malts for the pale beers; stouts are made with roasted malt or roasted barley. Continental beers, including "lager", are fermented very cold with a yeast which goes to the bottom of the vessel and these beers are stored a long time before use.

**BEET.** The vegetables known as beets probably came from a plant called by the Latin name of *Beta vulgaris* which still grows wild along the shores of the Mediterranean and of the Canary Islands. Beets have thick, solid roots, and in the first of the two years of their growth only the roots and leaves appear. Farmers usually dig up the beets during the first year, so the flowers and seeds which develop in the second year of growth are not normally seen.

There are several different kinds of beets, some of which are grown for people to eat and others for animals. The beetroot, also known as the red beet or garden beet, has a round, purplish-red root which is usually cooked and served in salads. The Swiss chard (which is



usually known as perpetual spinach or spinach beet) is grown for its leaves, which may be eaten and which taste very like spinach. The mangel-wurzel is valuable for feeding cattle and sheep during the winter, for it can be kept from autumn until late spring.

Perhaps the most important type of beet is the sugar beet. This is a white root and from it more than half the supply of sugar in the world is made.

**BEETHOVEN, Ludwig van** (1770-1827). When people talk about Beethoven today they think of him as a composer of great music of all kinds, yet in his own time he was admired more because he was a wonderful pianist. People especially marvelled at his astonishing power of playing a piece of music on the piano at the same time as he was actually composing it in his head (this is called extemporization), but his written music was often too difficult for them to listen to and too hard for them to play. Through the course of time, however, he has come to be regarded as one of the greatest composers that has ever lived.

Beethoven was born at Bonn, a town on the River Rhine in Germany which is now the capital city of the German Federal Republic. His cruel and lazy father was a singer at the court of the Archbishop-Elector of Cologne. When the little boy Ludwig showed signs of being musical his father thought he might get rich quickly by showing off his son as an infant wonder, as the great composer Mozart had been when he was little. (There is a separate article about him.) At

the age of four Ludwig was therefore locked into a room with a harpsichord and violin and told to practise, and at the age of eight he was also learning the organ. When he was 12 years old he was appointed to a post in the court theatre where his duty was to accompany the orchestra on the harpsichord. In this way, in spite of an unhappy childhood, he gained valuable experience in music and was already trying his hand at composing music himself.

The first important event of Beethoven's life was his visit to Vienna in 1787. There he met Mozart, who heard him play and said: "Pay attention to him; he will make a noise in the world some day." The visit to Vienna was cut short by the death of Beethoven's mother and he returned to Bonn. This time life became happier for him than it had been before. He met the von Breuning family, his first real friends, and Count Waldstein, who provided him with a piano and helped him in other ways.

Beethoven was now 18, stocky and rugged in appearance, ill-mannered, hot-tempered and obstinate. When he was not occupied in the court orchestra or with teaching he would go for long walks alone in the country, jotting down tunes that occurred to him in a little notebook, something which he did all his life. From these little notes he would work out the themes for his sonatas and symphonies. All his life he was a lonely and sad man, and although many stories are told of his love affairs he never married.

In 1792 Beethoven again left Bonn for Vienna to study composition with the composer Haydn. Haydn did not take much trouble with his pupil and the lessons ended when the master went to England in 1794. Beethoven then studied with J. G. Albrechtsberger, a strict teacher who could not understand his pupil's rebellious nature.

On this second visit to Vienna everything at first went well. Beethoven was successful both as a pianist and as a composer, playing his own music at the court and at other important concerts, teaching many of the nobility and having new works published all the time. The Prince and Princess Lichnowsky provided him with money. However, he was always quarrelling, having difficulty over his servants and his lodg-



*Beethoven-Haus Bonn, Bodmer Collection*

A miniature portrait of Beethoven at the age of 32.

ings and indulging in practical jokes.

It was at this time that Beethoven became deaf. He had already had trouble with his hearing, but by 1801 it was becoming more and more serious and in the end he could hear nothing at all. It was a terrible thing to happen to a musician—and yet it was after this that he wrote some of his most wonderful music—music which he never heard himself. Gradually he withdrew more and more into himself and his music; his behaviour, too, grew more strange and difficult when he could no longer enjoy other people's company. At the first performance of his ninth symphony in 1824 he was so completely deaf that a friend had to turn him round to see the thunderous applause for his music. He remained in Vienna until his death at the age of 57.

### Beethoven's Music

Before Beethoven's time the music of great composers like Haydn and Mozart was graceful and delicate, full of beautiful and charming tunes and perfectly planned. Beethoven's music was stronger and more romantic, full of personal

## BEETLE

feelings; it could express the most unbearable sadness, or joy and delight, or even laughter, as the composer wished. This seemed like a revolution in music at the time and was one of the reasons why people did not altogether realize Beethoven's greatness during his lifetime. His own strong and stubborn character comes out in his vigorous music.

He was chiefly a composer of music to be played on instruments rather than to be sung, although he did write choral masses and an opera called *Fidelio*, and the last movement of his ninth symphony is choral. His greatest works are his nine symphonies and 17 string quartets (pieces for four players). Musicians think of the nine symphonies of Beethoven in the same way as writers think of the plays of Shakespeare: they are among the greatest works of music.

Beethoven also wrote several overtures, five piano concertos and one violin concerto, 32 piano sonatas and a great deal of other music. (There are separate articles CHAMBER MUSIC; CHORAL MUSIC; CONCERTO; OPERA; OVERTURE; SONATA; SYMPHONY.)

**BEETLE.** Beetles are to be found in almost any place where animals exist, except in the sea. Something like 250,000 different species, or kinds, have been discovered in the world, of which about 4,000 have been found in Great Britain.

They are very easy insects to recognize, though they are all sorts of shapes and may be as small as a pin's head or as big as a man's fist. True beetles have the scientific name of Coleoptera, which means sheath-winged, and they all have one thing in common: what should be the front pair of wings are not wings at all, but thick, usually tight-fitting sheaths, or covers (called *elytra*), which completely cover the real pair of wings and so protect them. Only beetles have sheaths like this and they usually meet in a straight line down the middle of the back. Sometimes bugs are mistaken for beetles, but instead of the powerful biting jaws of beetles they have sharp-pointed beaks through which they suck their food. (See BUG.)

When a beetle flies, it lifts up its wing covers and then spreads out the wide, thin wings behind

them. All beetles were, at one time, flying insects but many of them, like the common ground beetles, have given up flying and depend on their six legs for travelling about.

Although most beetles have eyes with which they can quickly see approaching danger, their most useful organs (parts of their bodies) are those with which they smell. These are chiefly contained in the antennae, called feelers by most people, and help them to find their food and recognize others of their own kind. However, there is little doubt that male and female fireflies and glow-worms, which are beetles in spite of their names, find each other partly by means of their lights. (See the article FIREFLY AND GLOW-WORM.)

Many beetles can make chirping or squealing sounds by rubbing one part of the body against another. Often this is done by scraping the legs over very fine close ridges on another part of the body, rather as a bow is used to scrape the strings of a violin. This noise is called stridulation. The deathwatch beetle makes a tapping noise by banging with its head, usually against wood. (See DEATHWATCH BEETLE.)

In one respect beetles are like bees and wasps, butterflies and moths. They are not born as little beetles which grow gradually into large ones, but instead start as eggs from which larvae, or grubs, hatch. These spend all their time eating and as they grow they keep on shedding their skins, which become too tight for them, until eventually they turn into pupae. In this stage, like the chrysalises of butterflies, they rest and when they hatch out they are fully grown beetles.

Most beetles are careful to lay their eggs where the larvae will find plenty of food. This is not difficult, for most of them feed on leaves, flowers, stems and roots of plants and even the wood of trees.

Some, however, have to go to much more trouble. The dung beetles make burrows beneath cow dung and stock the holes with dung for the larvae to feed on. The scarabs, once the sacred beetles of Egypt, first make balls of manure and then pull and push these balls into holes they have already prepared, after which they lay their eggs on top of them. (See SCARAB.) Burying beetles have much the same habit;

underneath small dead animals they make a pit into which they pull the carcase and on this they lay their eggs so that their grubs can feed as soon as they hatch. All these kinds lay only a few eggs because the food for their offspring is plentiful and they are all likely to survive.

The blister beetles and the oil beetles go to the other extreme and may lay as many as 10,000 eggs. Each tiny grub that hatches needs to feed first on the egg of a bee and then on honey and pollen. To reach the bee's nest it lies in wait for a bee visiting a flower. It then fastens itself to the insect's hairy body and so gets carried to the hive. No wonder these beetles have to lay so many eggs; it is surprising that even one in a thousand should find the right kind of flower and the right kind of bee.

### **Beetles that are Harmful**

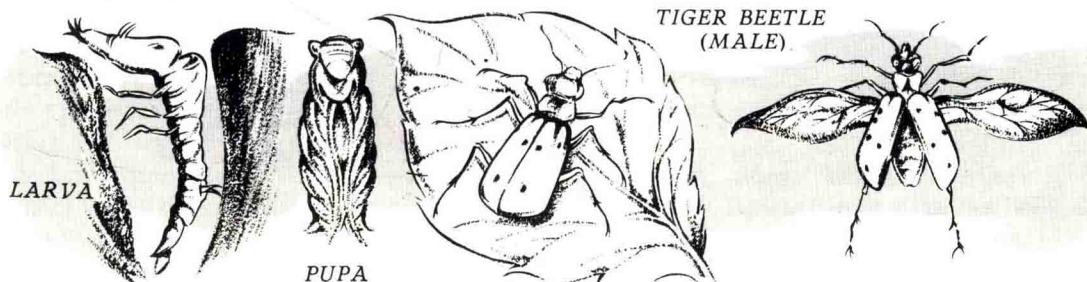
One of the most destructive beetles is the Colorado beetle which, having been brought across the Atlantic from North America by accident, has become a terrible pest on potatoes in Europe also. Both the beetle itself and its grub eat the leaves, stems and even sometimes the roots of potato plants. (See COLORADO BEETLE.) The Colorado is one of a very large family of beetles which feed on plants. The family includes the pretty little asparagus beetle, another pest, and also the tiny but troublesome flea beetles which eat the leaves of cabbages, turnips and other plants, often killing them when they are small. If it is disturbed it hops off the plant just like a flea.

Much bigger than this are the handsome long-horned beetles, whose "horns" are really antennae. The grubs of these beetles burrow into the wood of trees and often take years to grow up, so that they may not come out of the wood until

it has been made into timber and used in houses and elsewhere. The bark beetles, which look just like the bark of the trees they live on, are among others that cause serious damage to valuable timber.

Although most weevils are quite harmless (see WEEVIL) there are quite a number which cause serious trouble by attacking corn, rice, cotton, palms, nuts and so on. In the old days they were often found in ship's biscuits. Among the harmful beetles which live in the house are the carpet beetle and the furniture beetle. Carpet beetles are pretty little oval insects and it is their larvae that do most of the damage to carpets and clothes as well. The furniture beetle, a relation of the notorious deathwatch beetle which causes such damage to the woodwork of old churches, lays its eggs in cracks or crevices of the furniture. When they hatch, the grubs may then turn the woodwork to mere powder inside. When nearly full fed the grubs bore their way outwards until they are just below the surface of the wood, so that when they turn into beetles they can escape easily through the holes known as "worm-holes". The so-called woodworm is in fact the grub of the furniture beetle.

The mealworm is really the grub of a beetle and so is the wire-worm, which lives in the soil and feeds on the roots of plants. Wireworms can do great damage to corn and other crops. They turn into the rather attractive click-beetles, named from their habit of jumping into the air with a snap when they have fallen on their backs. Buprestid beetles, which are big brothers of the click-beetles, live mostly in very hot countries and some are destructive to timber. Nearly all of them are brightly coloured and many are so highly polished that they look like metal. The Indians of South America use these beetles



The larva of the tiger beetle lives in a burrow. It lies in wait to catch and eat other insects that walk over it.

BEETLE



(1) Ladybird. (2) Soldier beetle. (3) Cockchafer. (4) Burying beetle. (5) Bombardier beetle. (6) Goliath beetle from West Africa, showing its size compared with that of a ladybird. (7) Tiger beetle. (8) Musk beetles. (9) Devil's coach-horse. (10) *Gymnopleurus sinuatus*. This dung beetle from Assam is related to the sacred scarab beetles of Egypt.

as ornaments for this reason.

Cockchafer are also a great pest in many cases, for their grubs feed on the roots of crops, the beetles into which they change feeding on the leaves of fruit trees and other kinds of tree. (See COCKCHAFER.) The Maybug, or June-bug, which is really a cockchafer beetle, damages the roots of strawberry plants.

### Harmless and Helpful Beetles

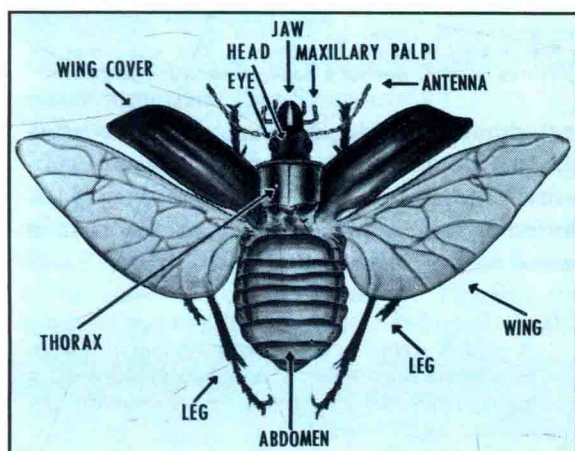
After describing so many of the beetles which do harm it is only fair to state that most beetles are harmless and some actually helpful to man. The well-known ladybirds (see LADYBIRD), which are also beetles, are often very useful, for many of them eat huge numbers of the harmful greenflies (see APHID) and scale insects (see SCALE INSECT).

A great many beetles live by scavenging the useless rubbish that collects in houses, hedges, old tree stumps, birds' nests and similar places. Among these are many of the rove beetles which are very easily recognized, for they are narrow and their wing cases cover only about half their bodies. Most are very small, but the devil's coach horse, the best-known British species, is about over two centimetres long and always cocks its tail up over its head when frightened. Other beetles, such as the burying beetles, are useful in helping to clear away dead animals.

Among the most active species are the brightly coloured tiger beetles that may be found in hot, sandy places, flying about very actively in the sun. The grub lives in a tube-like burrow in the ground, lying in wait with its head sticking out over the top, to seize and eat other insects that walk over it. Ground beetles are very similar and might be called hunting beetles because, both as grubs and as beetles, they spend their time searching out other small creatures to eat. The largest ground beetles are about five centimetres long and the smallest is only a little bigger than a pin's head. The smaller ones live amongst rotting leaf-mould, under stones and in caves, often being quite blind. When frightened some of them squirt out a nasty-smelling liquid from the end of the body; one in Great Britain, called the bombardier, sends out a liquid which explodes into a small amount of poison gas, under

cover of which it runs away.

Water beetles form another very large group. They are all of the same rounded, "stream-lined" shape and propel themselves through or over the water with their hairy hind legs, which act like oars. The middle pair of legs is generally used for clinging to weeds and the front pair for seizing the beetle's prey, which may be an insect or even a large creature such as a tadpole or a small minnow. Other water beetles feed on plants, however. All water beetles have to come to the surface for air from time to time and often they leave the water and fly long distances to other ponds and streams.



Although beetles are of many shapes and sizes, they all have some form of the parts shown here.

Male stagbeetles have great jaws which look like antlers (see STAGBEETLE). They sometimes frighten people but in fact the jaws are not of much use for biting. In hot countries stagbeetles are common and it is there, too, that their cousins the Hercules and Goliath beetles live. These are amongst the biggest of all insects, as big as a man's fist and very hard and tough. It is not always the jaws which grow into "antlers"; sometimes other parts of the head or of the thorax grow horns.

**BEETON, Mrs. Isabella Mary** (1836–1865). Mrs. Beeton wrote a famous book about cooking and looking after a house.

The title of this book is *Household Management*. It took Mrs. Beeton four years to write it,



Radio Times Hulton Picture Library

A French kitchen of the 19th century. This was one of the pictures in Mrs. Beeton's book *Household Management*.

and although it was published about 100 years ago it is still used by housewives today. It contains hundreds of recipes all of which Mrs. Beeton is said to have tested herself. Here is one of them, for Farmer's Fruit Cake.

**Ingredients.** Take 1 cup of dried sour apples, 1 cup of golden syrup, 1 cup of sugar,  $\frac{1}{3}$  cup of butter,  $\frac{1}{2}$  cup of sour milk, 1 teaspoonful of soda, 2 teaspoonfuls of cinnamon, 1 teaspoonful of cloves, 1 egg, 2 cups of flour.

**Mode.** Chop the apples fine, and soak overnight; in the morning let them simmer for two hours with the syrup. Prepare the other ingredients as for any cake, beating well, adding the apple and syrup when a little cool, not cold. Bake in tins in a moderate oven.

**Time.**  $\frac{1}{2}$  to  $\frac{3}{4}$  hour. **Average cost,** 10d.

Seasonable at any time.

People sometimes make jokes about Mrs. Beeton's recipes, saying that they start with a sentence like "Take a dozen eggs . . ." or "Take a pint of cream . . ." but it should be remembered that Mrs. Beeton wrote her book for large Victorian families which included servants, so the joints, cakes and other dishes had to be large enough to feed a good many people. In fact, Mrs. Beeton wanted her book to be really useful to people in running their houses well without being extravagant, and at the end of each recipe she put the approximate cost of the dish. Today

there are many labour-saving machines, like gas and electric cookers and refrigerators, that were not invented in Mrs. Beeton's time, but even though life is different now, many cooks still consider that her recipes are the best of all.

As well as cookery, *Household Management* gave information about such things as the duties of the housekeeper and other servants, the arrangement of the kitchen, table decoration and the management of the nursery and the sick-room.

Mrs. Beeton's maiden name was Isabella Mayson. She was born in the City of London and she married Samuel Beeton, a Fleet Street publisher, when she was 20 years old. She was interested in many things besides housekeeping—she was a clever musician, for instance. She also studied the fashions of her day, and invented probably the first paper patterns to be used for dressmaking at home. When making these patterns she used her own clothes, which she bought in Paris, as a guide.

She died, leaving a family of four children, when she was only 29 years old.

**BEIRUT** is the capital and chief seaport of the republic of the Lebanon, at the eastern end of the Mediterranean Sea. The town lies on a pro-



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The entrance to the Jewellery Market in Beirut. The shop signs are written in two or even three languages.

montory just south of St. George's Bay, where the saint is supposed to have slain the dragon.

Beirut first achieved fame under the Romans in the 3rd century A.D. when the chief school of Roman law was set up there. In 551, however, an earthquake destroyed the town and it never returned to its previous splendour. It revived a little under the crusaders in the 12th century, but it was not until the 14th century that it started to be a prosperous seaport. Late in the 19th century French companies built the harbour and the railway to Damascus. French is the second language, after Arabic, and there are three universities, including a big American one. Beirut is the chief centre of trade and banking in the Middle East. It is also a popular tourist resort. The population is about 475,000. The life of Beirut was badly disrupted by the civil war which broke out in 1975. (See LEBANON.)

**BELFAST** is the capital city of Northern Ireland and a great seaport, lying at the point where the River Lagan joins the arm of the sea known as Belfast Lough. It is the chief industrial centre of Northern Ireland.

Like London and many other cities, Belfast was founded at a point where a river could be forded, or crossed by wading. It was founded by Sir Arthur Chichester, then chief governor of Ireland, at the beginning of the 17th century. The centre of the city is low-lying, but it is surrounded by hills.

During the English Civil War Belfast was in 1648 occupied by Cromwell's forces under George Monck. It was quite a small town until the end of the 18th century, but then grew rapidly. It first became industrialized by the establishment of cotton mills, but this industry died out when the American Civil War cut supplies of raw cotton. Belfast next became one of the world's chief centres of linen manufacture, and nowadays it is also a centre of the synthetic textile industries. (See SYNTHETICS.)

Belfast is also a great shipbuilding centre. The first ship to be launched there was the "Eagle's Wing", built in 1636 for some Presbyterians who wished to emigrate to America. Small shipbuilding yards were at work in Belfast at the close of the 18th century. In 1847 the River Lagan was deepened by dredging, and in



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Belfast's huge city hall was built in 1906. The architect followed the Renaissance style used by Wren for St. Paul's.