

Not marry OR marry?



Freedom to go where one likes



Children (if it please God)



Not forced to visit relatives



Constant companion
(& friend in old age)



Perhaps quarrelling



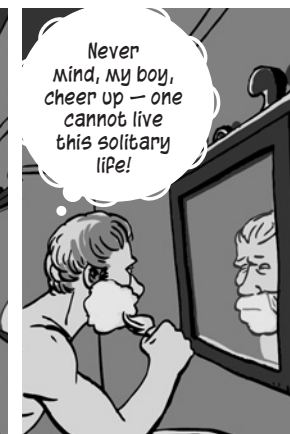
Charms of music & female chit-chat
— these are good for one's health



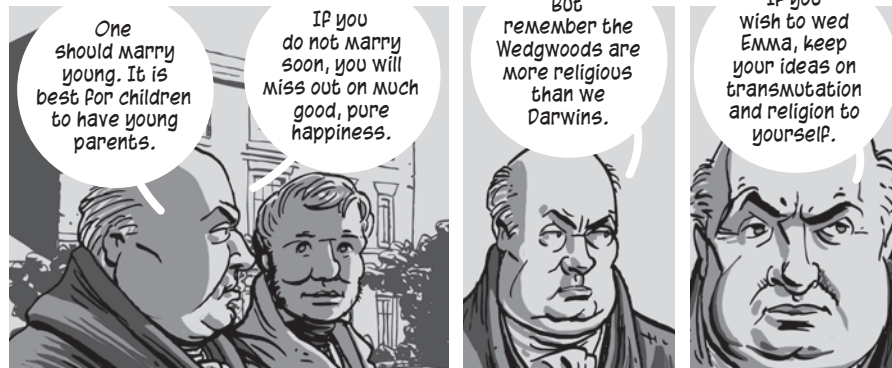
Less money for books, etc.



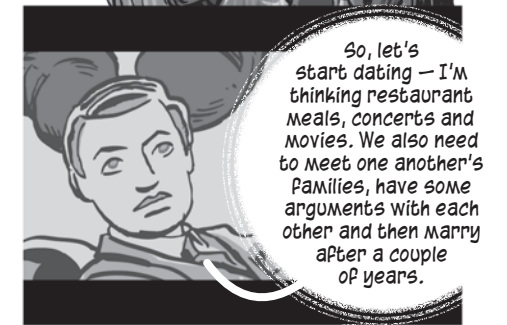
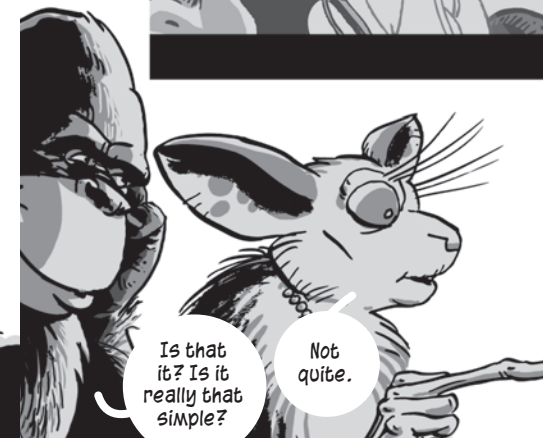
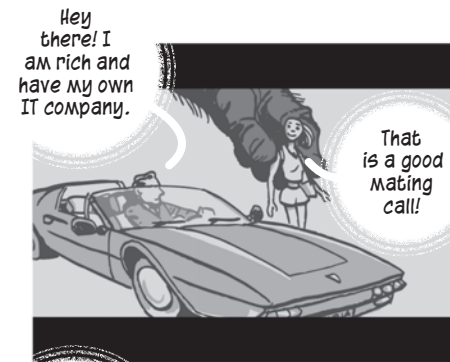
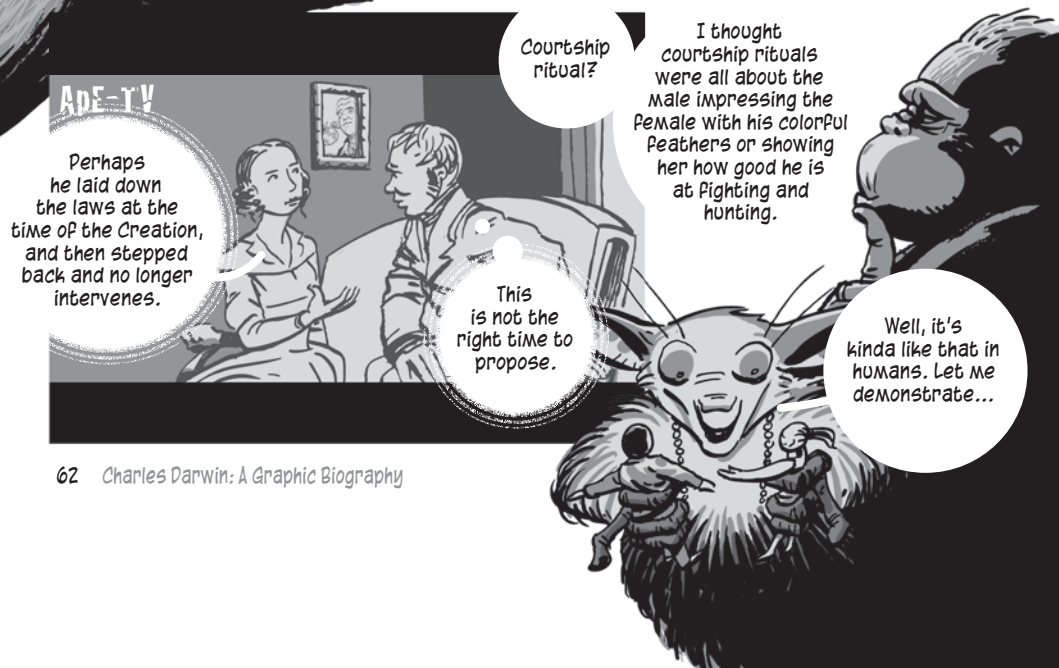
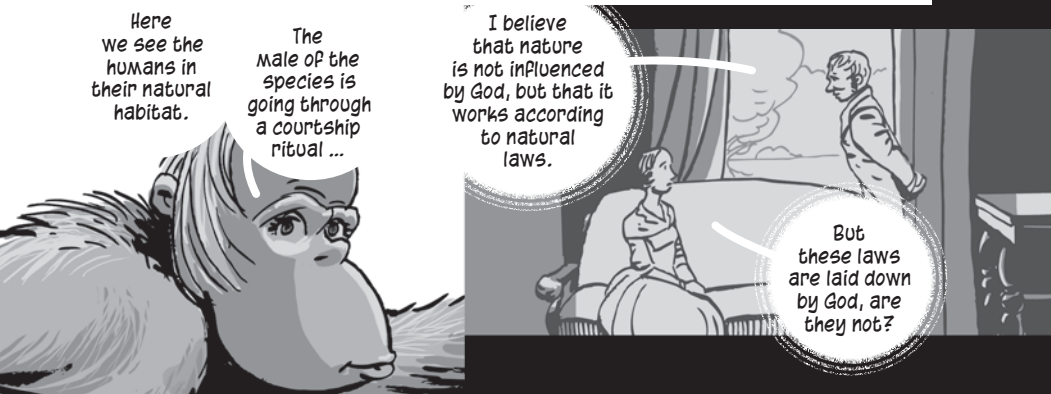
Object to be beloved & played with
— better than a dog anyhow.

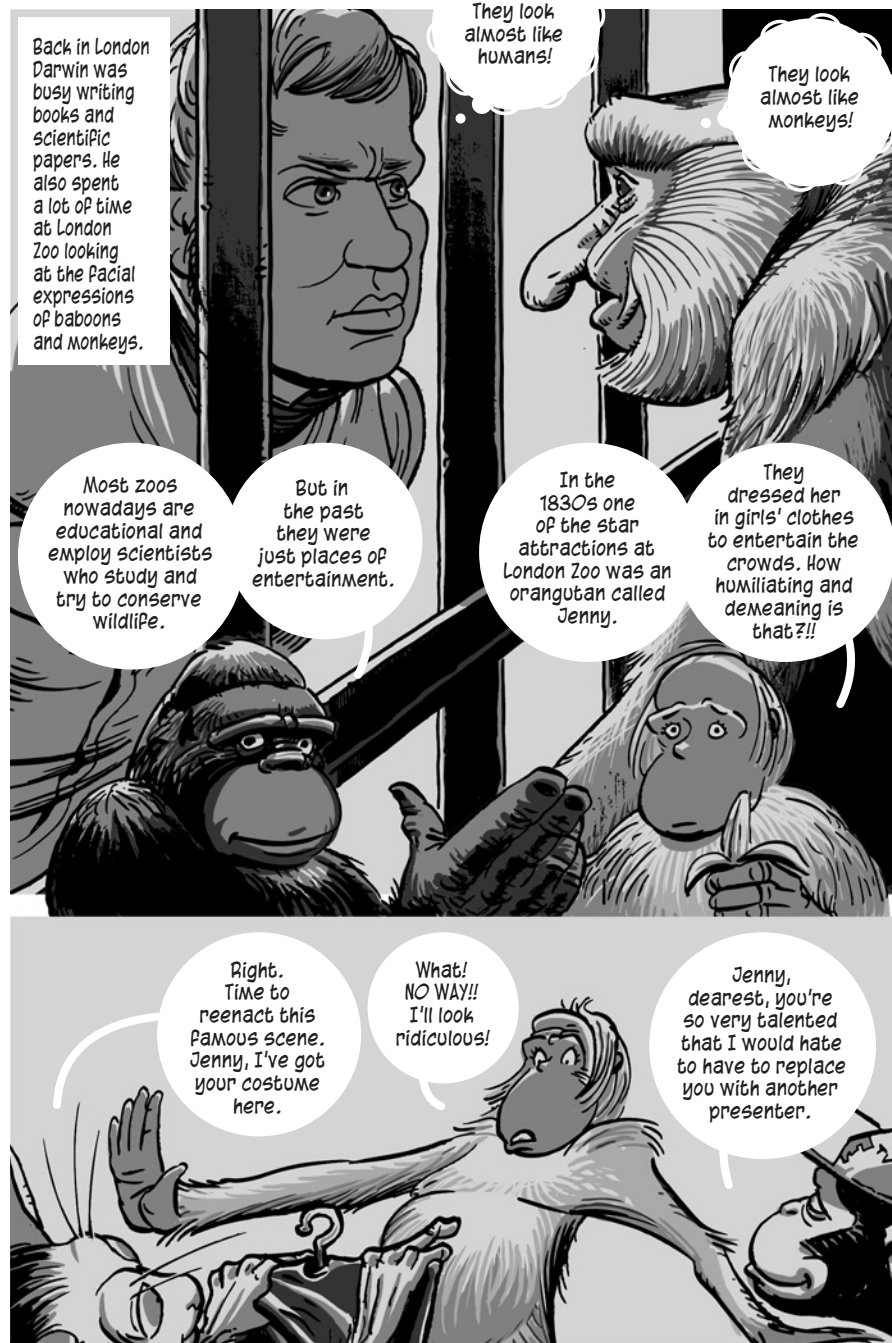


Visiting his Family in Shrewsbury, he told his Father about his ideas on transmutation. He also told him he was thinking of marrying his cousin Emma.



He rode out to the Wedgwood estate to see Emma, but he did not follow his Father's advice.





Darwin wrote:

The keeper showed her an apple but would not give it her, whereupon she threw herself on her back, kicked and cried, precisely like a naughty child.



She then looked very sulky & after two or three fits of passion the keeper said, "Jenny if you will stop bawling & be a good girl I will give you the apple."



She certainly understood every word of this ... She at last succeeded & then got the apple, with which she jumped into an arm-chair & began eating it with the most contented countenance imaginable.





Darwin did eventually propose to Emma, and they were married on January 29, 1839. Both Pather's gave them plenty of money, which went into various investments to provide a comfortable income. They never had to worry about money and could afford servants.

Here the humans are mating.



Now we show them nesting.

They moved to a house at 12 Upper Gower Street, London, close to Regents Park.



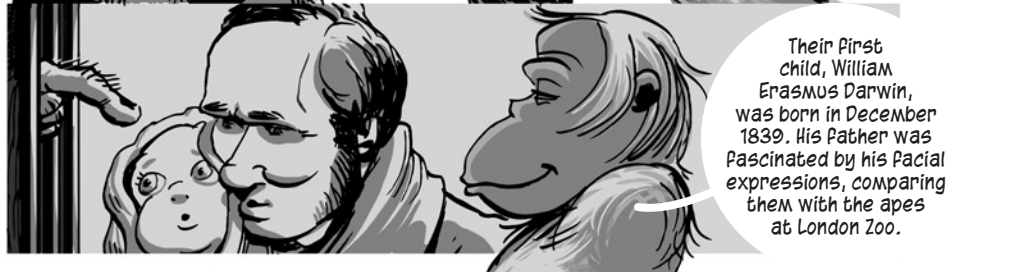
Here, in the nest, the human female lays her eggs.

Dave, sweetie, stick to the script, please!

Humans don't lay eggs.

CUT!

Yeah, Dave! Everyone knows human babies are delivered by storks.



Their first child, William Erasmus Darwin, was born in December 1839. His father was fascinated by his facial expressions, comparing them with the apes at London Zoo.



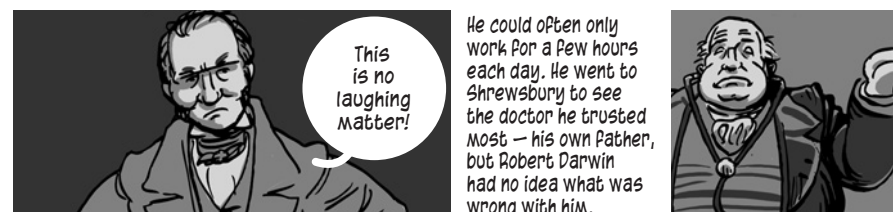
And here, we see the human male hunting for food for the young.

I'll get one of the servants to go shopping.

But Darwin's life at this time was not completely happy. He had started to suffer from health problems that would plague him for the rest of his life.



He was regularly struck down by headaches, stomach pains, nausea, weakness, chest pains and belching.



This is no laughing matter!

He could often only work for a few hours each day. He went to Shrewsbury to see the doctor he trusted most - his own father, but Robert Darwin had no idea what was wrong with him.

London was not a healthy place. It was overcrowded, smoky (everyone had coal fires) and dirty. The Thames was an open sewer and diseases like cholera, tuberculosis and typhus killed thousands. This was also a time of great political unrest; there was an economic depression, and starving, angry workers were on the streets. The Darwins decided to get out.



In September 1842 they moved to Down House at Downe in Kent, which in those days was a quiet village. They would live here for the rest of their lives.



Despite his illness and his heavy workload, Darwin was still thinking about transmutation and was very impressed by Thomas Malthus's book *Essay on the Principle of Population*.

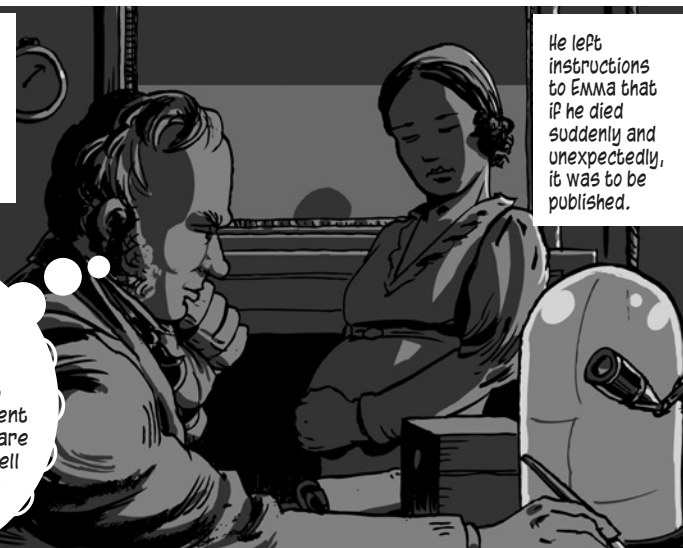


Malthus said the human population grows faster than its ability to grow or find enough food. Darwin reckoned the same thing happened in nature. More individuals of each species would be born than could be supported by the food supply. There would be competition among the species for food, a contest in which the strongest would survive and the weakest would die.

In the summer of 1842 he wrote a short outline of what he called "My Theory," and later turned this into a longer 230-page essay.

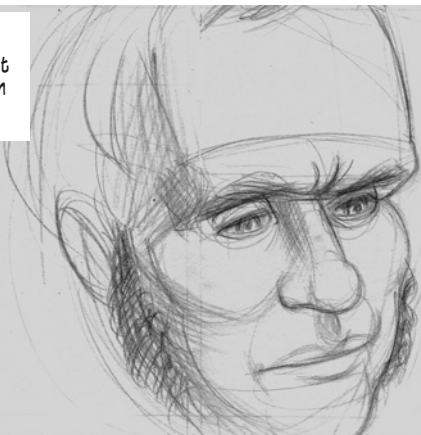
He left instructions to Emma that if he died suddenly and unexpectedly, it was to be published.

Species change and develop as their environment changes. The individuals of each species best suited to survival in their environment will live, while those that are not will die. And fossils tell us that entire species will sometimes die out.



He kept his theory secret for more than 10 years.

Why?



First, he wasn't absolutely sure about it. If he published his theory and another naturalist proved it was nonsense, his reputation as a scientist would be ruined.

Second, it would anger and upset a lot of his friends, including quite a few naturalists, who still believed that God was somehow involved in nature.

Third, the church would see it as an attack on religion. In 1844, a book called *Vestiges of the Natural History of Creation*, said that everything from the solar system to the Earth, rocks, plants and animals had all developed from other forms. Fossils, it said, were evidence that creatures in the past had died out. They could not possibly have been designed by God, because God would have made them perfect. *Vestiges* said it was ridiculous to believe that God would personally take the trouble to design a new species of shellfish, for example.



In short, this book was making the case for transmutation. It was attacked by the church and by naturalists. Darwin himself thought the science in it was poor. The author — the Scottish journalist and publisher Robert Chambers — chose to remain anonymous because he knew how much trouble it would cause.



Darwin had much better scientific evidence for transmutation, but he decided to keep quiet.



Darwin also disliked the way *Vestiges* was popular with political radicals, atheists (people who don't believe in God) and "Preethinkers" who said that beliefs should be based on science and logic, not emotion or religion.

To radicals and Preethinkers, the Church of England was a key part of a system that kept aristocrats, landowners and businessmen rich and kept working people poor.



Offending the Church of England was dangerous. Take the case of George Holyoake, for example ...

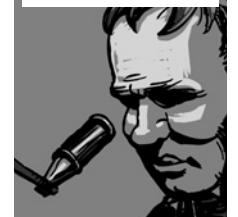


Holyoake (1817-1906) was on his way to Bristol to become editor of a radical magazine when he gave a talk to working men in Cheltenham. He criticized the church and was arrested and charged with blasphemy and atheism. He was tried by jury for the "crime" of not believing in God, and sentenced to six months in Gloucester prison.



Here he was only fed gruel, bread, rice and potatoes, and was not allowed to read the newspapers his friends sent him. He got into more trouble for refusing to take part in prison prayers. Meanwhile, his wife and children were reduced to poverty and his two-year-old daughter, Madeleine, died as a result.

Darwin wanted nothing to do with atheists and political radicals anyway. He was not interested in politics, but in science.



Darwin's ill health plagued him through all these years, and some of his biographers have suggested that the headaches, nausea, burping, fatigue, etc., were caused by stress and worry over his theory.



Or it might have been something he picked up on his travels. He may have had Chagas disease, which is spread in South America by a bug. Darwin had been bitten by one when traveling in Argentina, writing in his diary at the time:

At night I experienced an attack (for it deserves no less a name) of the Benchuca (Vinchuca) ... the great black bug of the Pampas. It is most disgusting to feel soft wingless insects, about an inch long, crawling over one's body. Before sucking they are quite thin but afterwards they become round and bloated with blood.

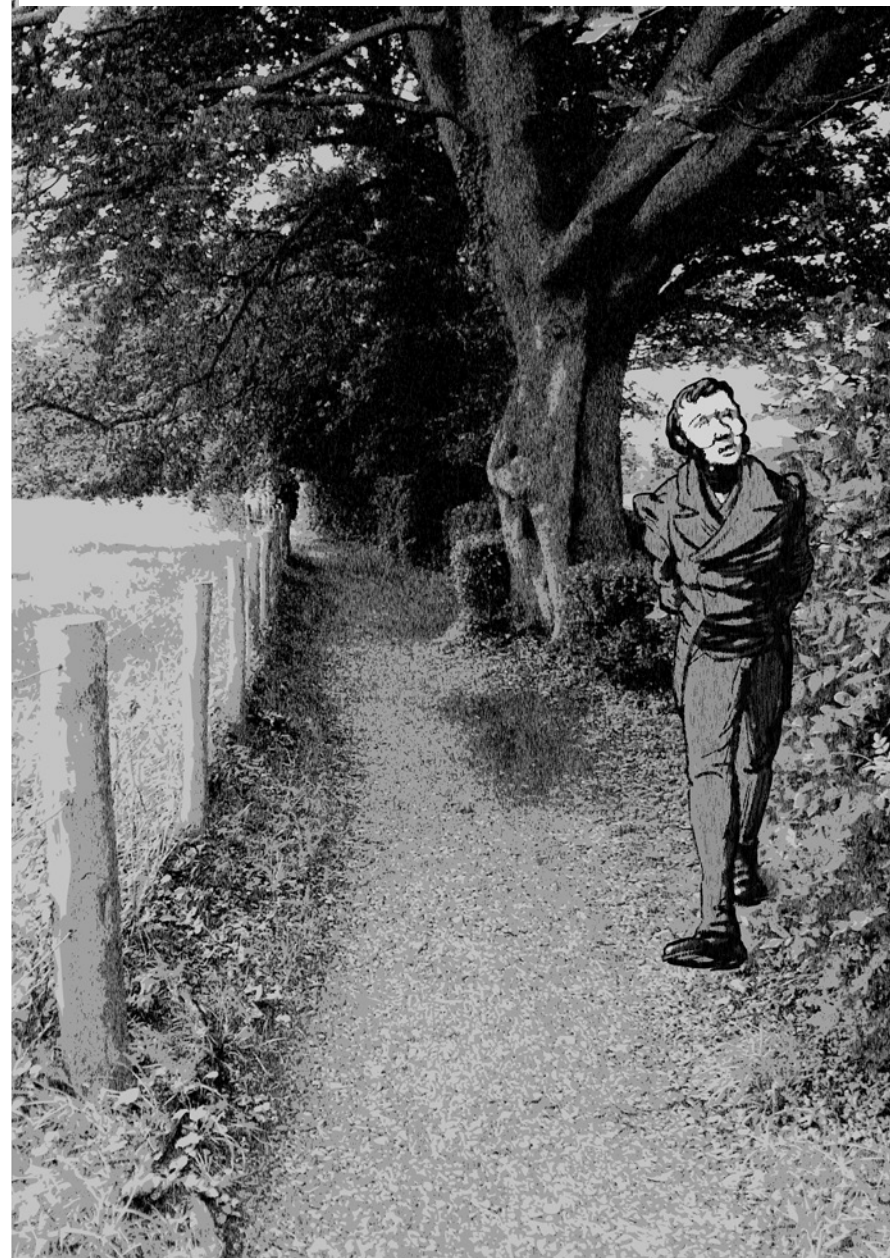


But we really can't be sure what he was suffering from.

At Down House, he hid away from the world, concentrating on his work when he wasn't ill. He even had a mirror outside the window of his study so he could see if there were any visitors approaching. If he didn't want to see them, he would pretend he wasn't in.



He later rented a strip of land near the house where he laid out a path in the shade of the trees — his "Sandwalk" where he would take a stroll every day to think.



Darwin put his notebooks away for several years and got on with other work.

He was now becoming a well-known figure. His book on the Beagle voyage had sold well and was still popular. *The Journal of Researches into the Natural History and Geology of the Countries Visited During the Voyage of HMS Beagle* has never been out of print since first being published in 1839.

Nowadays we usually just call it *The Voyage of the Beagle*.

The success of my first literary child always tickles my vanity more than that of any of my other books.

He also edited and contributed to a five-book series on the fossils and animals that the Beagle voyage had encountered.

He also wrote books and papers on how coral reefs are formed, and about the geology of South America.

Then he studied barnacles, the crustaceans you find in the sea attached to rocks, ships' hulls and other hard surfaces. He ended up dissecting and describing every single species of barnacle known at the time. He wrote books about barnacles. This took eight years of his life. He later said:

I doubt whether the work was worth the consumption of so much time.

Emma was busy, too. For the first 12 years of marriage, she was pregnant almost all the time. In all they had ten children, although two of them died very young. Victorians had large families, partly because they didn't expect all their children to survive. Many young children died from diseases that are easily treated nowadays. Another reason for big families was that they didn't have modern family-planning methods.

We owe a lot to medical science.

Darwin was a loving father. Though the children had been told they shouldn't disturb him in his study, he never minded them coming in.

He sometimes got them to help with his work. One visitor once reported that when Darwin was studying earthworms, he had one of the children playing the bassoon to them to see if they could hear.

The Darwin kids didn't always realize their home was different from everyone else's. One of the younger ones once asked a friend:

Where does your father do his barnacles?

It was a terrible blow to both Charles and Emma Darwin when, in 1851, their eldest daughter Annie died of a fever at the age of 10.

She was a most sweet and affectionate child, and I feel sure would have grown into a delightful woman ...

Tears still sometimes come into my eyes, when I think of her sweet ways.

He called it a "bitter and cruel loss" and neither he nor his wife ever completely got over it. This shocking, horrible experience undermined his belief in a loving God.

His health problems continued. When his father died in 1848, Darwin was too ill to get to the funeral in time.

He went to Malvern to see Dr. James Gully, a well-known doctor who specialized in the "water cure." This basically involved spending a lot of time in cold water.

Though Darwin had no confidence in it, he was desperate enough to try anything.

To his surprise, he started feeling much better. When he returned to Down House, he had a shower house built in the garden. It contained a tub in which he would stand every morning.

A 40-gallon tank overhead would release freezing water onto him when he pulled a cord.

Meanwhile, the world was changing. Although the majority of people lived in what we would consider desperate poverty, the political unrest of the 1840s had now faded. Many of the radicals were now considered respectable, and the church and the old aristocracy were being challenged both by industry and by workers' movements.



At the same time, the success of *Vestiges of the Natural History of Creation* showed that many people were starting to question whether all of the Bible was literally true.

Darwin had by now talked about transmutation with a few scientific friends. Aside from Lyell, one of the most important of these was the botanist and explorer Joseph Dalton Hooker.

Hooker was a plant expert, and like Darwin, he had traveled as a naturalist on Royal Navy ships. Darwin had confessed his theories on transmutation to Hooker some years before, saying they were so controversial that he felt as though he was confessing to a murder.



There was also Thomas Huxley, whom he met in the early 1850s. Huxley had also been a Royal Navy naturalist.

Hooker and Huxley didn't agree with him completely, but they encouraged him to publish his theory.

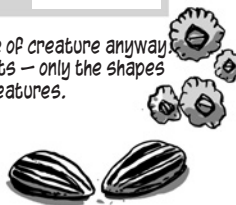
Darwin decided to write a big and very detailed book. Unlike *Vestiges* it would not be aimed at the public, but at his fellow scientists. If he could convince the scientific world of his theory, the rest of the world would follow.



Before he could write it, there was still a lot of work to do.

His studies of barnacles meant that he was now an expert on transmutation — in one type of creature anyway. There are hundreds of different species of barnacle, but all consist of the same basic parts — only the shapes and sizes are different. He worked out how they had evolved from prehistoric crab-like creatures.

He also carried out experiments to prove that seeds could be carried to islands where they might develop into new plant species in isolation from the rest of the world. He took various seeds, soaked them in salt water for weeks at a time and then planted them.



They germinated and grew.



Seeds can be carried to islands on the currents of seas and oceans and will still grow despite being immersed in salt water.

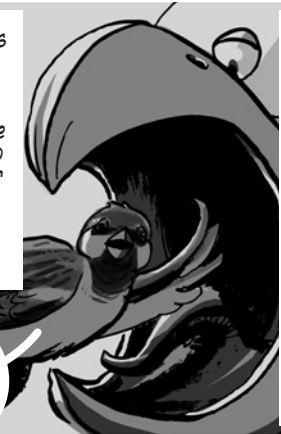
He wrote to naturalists and gardeners asking them for evidence of seeds stuck on birds' feet.

He also dug around in bird droppings looking for seeds they had eaten, and successfully grew these, too, proving that seeds could be carried off in different directions by birds who had eaten them (or the fruits or berries they had been in).



He fed sparrows on seeds and THEN fed the sparrows to an owl and an eagle at London Zoo to test whether or not the seeds survived in the owl and eagle droppings.

I don't mind. It's all for science!



So it was possible for plant life to travel on ocean currents, or attached to the feathers or in the stomachs of birds. Proving this was vital, because without plant life, animals could not survive.

He also became a pigeon fancier. He joined two clubs where pigeon breeders met to discuss their hobby and swap hints and tips. He also wrote letters to pigeon experts and set up his own lofts at Down House — he had about 90 birds by 1856.



He dissected dead pigeons and the embryos from pigeon eggs.

Notice how all the pigeons look different, but their embryos all look the same.

These different birds ALL come from the same ancestors — prehistoric doves.



Darwin's fellow naturalists were bemused by the way he met, and talked to, farmers and working-class animal breeders, and would read farming books and manuals.



They nicknamed him "The Squire."

Farmers and pigeon fanciers interfered with nature, mating birds and animals to get bigger, fatter, more intelligent or more attractive breeds. This was artificial selection.



But now Darwin was ready to write a book about the subject that he had been thinking about for all this time — the way that nature, unassisted by man, creates new species. In other words, NATURAL SELECTION.

But then disaster threatened.