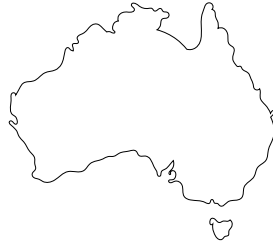


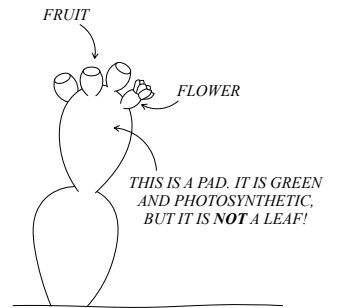
The BUG that saved AUSTRALIA



A true story

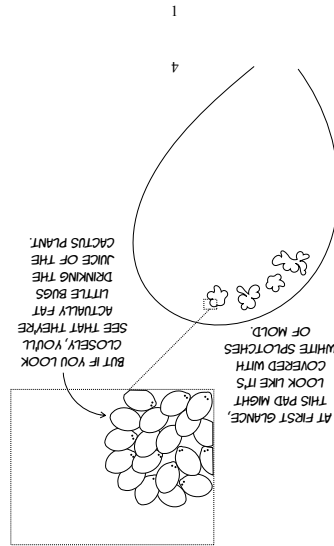
The prickly pear is a cactus native to the Americas. It is edible, and both the tender new pads and the fruit are used as a source of food. In Mexico the fruit are called *tuna* and the pads *nopal*.

Prickly pears grow very well in warm climates and are well adapted to drought. They don't have leaves (except for a *very* brief period when new pads sprout). The stem tissue grows into what are called pads. If these flat disk-like segments are cut off and placed on the ground, they will form roots and grow into a new plant.



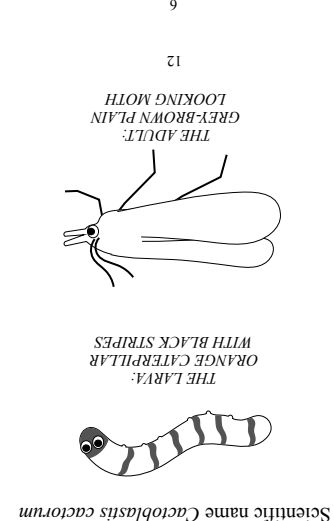
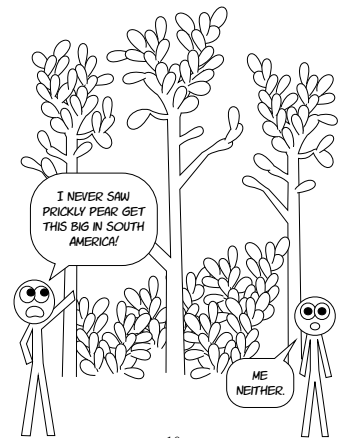
Opuntia ficus-indica IS THE MOST COMMON SPECIES. BUT THERE ARE MORE THAN 120 DIFFERENT SPECIES OF PRICKLY PEAR, MANY OF WHICH CAN HYBRIDIZE AND INTERMIX, GIVING HUNDREDS OF DIFFERENT VARIETIES.

In addition to being a food for people, the prickly pear is rather tasty to a certain bug called cochineal (scientific name *Dactylopius coccus*). This little scale insect happens to be one of the main sources of red dye. The Aztec and Maya people used it to dye cloth, and today it is still used in candy and cosmetics and clothing. If you've ever eaten anything colored with E120, Natural Red 4, carmine or cochineal, then you've eaten the (purified) remains of the cochineal insect, which in turn eats the prickly pear cactus.

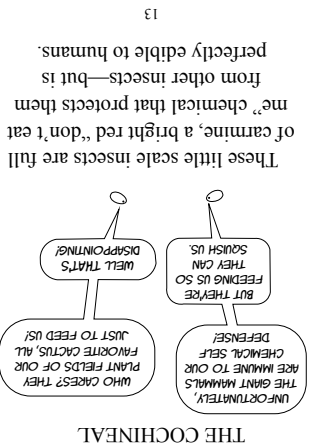
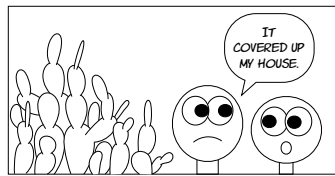
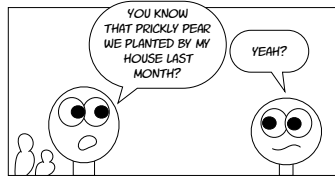
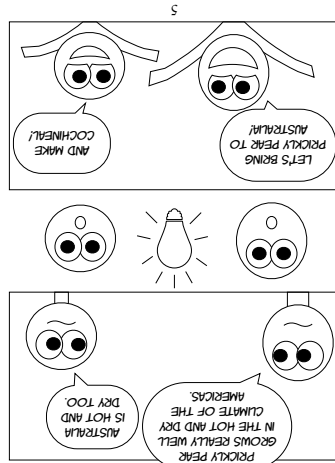


At the height of the prickly pear infestation, it covered more than 60 million acres of land. *That's bigger than the entire country of Great Britain!* It was spreading so quickly, that each year an additional *TWO MILLION* acres of land were being covered in prickly pear. Entire farms and houses were abandoned because they'd been swallowed up by the cactus.

It grew into dense spiny forests that were enormous. Sheep and cattle couldn't eat the cactus because of the spines, so the cactus ruined the land ranchers were using to graze their animals.



People tried burning, bulldozing, and poisoning the prickly pear. But it grew back so fast, these efforts didn't seem to make any difference. Each year the infestation grew worse, until a group of scientists brought an insect to Australia named *Cactoblastis*. The caterpillar of the *Cactoblastis* moth eats the inside of the prickly pear pads. Within just a few years of releasing the moth, the prickly pear infestation was no longer a problem. This story is one of the most famous and successful examples of biological control.



THE COCHINEAL

And there you have a true story that starts and ends with insects:

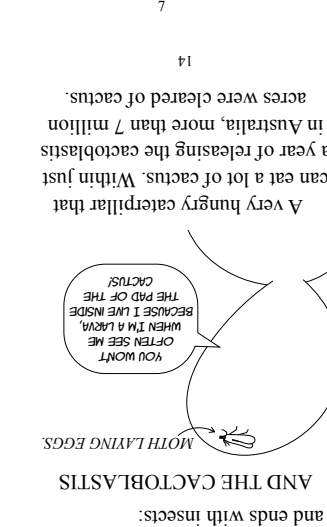
SCIENCE MOM
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In the late 1800s, the prickly pear was brought to Australia by people who wanted to produce cochineal. The concept of an invasive species didn't exist at this time. There were no regulations about transporting plants from one area to another. So several farmers took prickly pear plants from South America, put them on a boat, and carried them to Australia. The plants were used to set up cochineal farms, but the cochineal kept getting eaten by other insects. After a few years, farmers gave up on the idea of cochineal. The little bug just didn't do well in Australia.

But the prickly pear grew great. People planted the cactus as an ornamental around their houses or farms. It was easy to propagate. If you broke off a pad or branch and put it into the dirt, soon you'd have a new plant.

The cactus was spread by birds too: when they ate the fruit, the seeds would pass through, landing with a nice helping of fertilizer miles away from where the parent plant had grown.

After just a few years, people realized that they had a big problem: the prickly pear grew *too well* in Australia.



B	A	A	X
B	C	C	D
F	E	E	D
E	G	G	X