

The Colony

Honey bee castes and sexes



Improve your beekeeping by going to meetings



Superorganism

- Individuals
- Division of labour
- Superintelligence



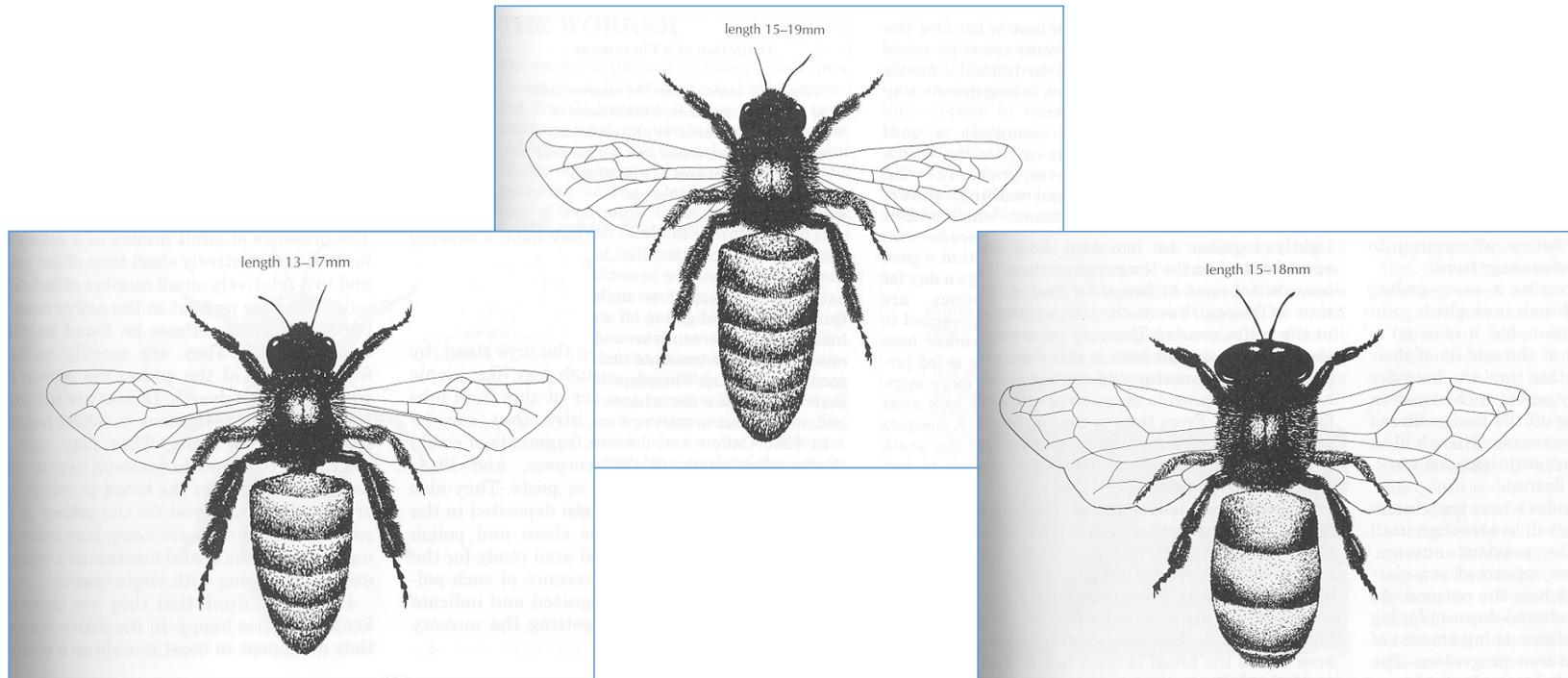
Benevolent Democracy run in the dark, using smells.



- Smell is as useful to bees as sight is to humans. They live in a world of scent which we unfortunately have reduced and polluted by introducing cars and concrete where flowers once wafted their heavy perfume into the breeze.

Of all the ways human beings communicate, probably the only one we have in common with honeybees is dancing. We don't generally regurgitate food into each other's mouths or waggle our bum in the air to release pheromone messages, for which we can all be grateful.

Number of bees in a colony



~60,000 workers

1 queen
but in winter

~2000 drones

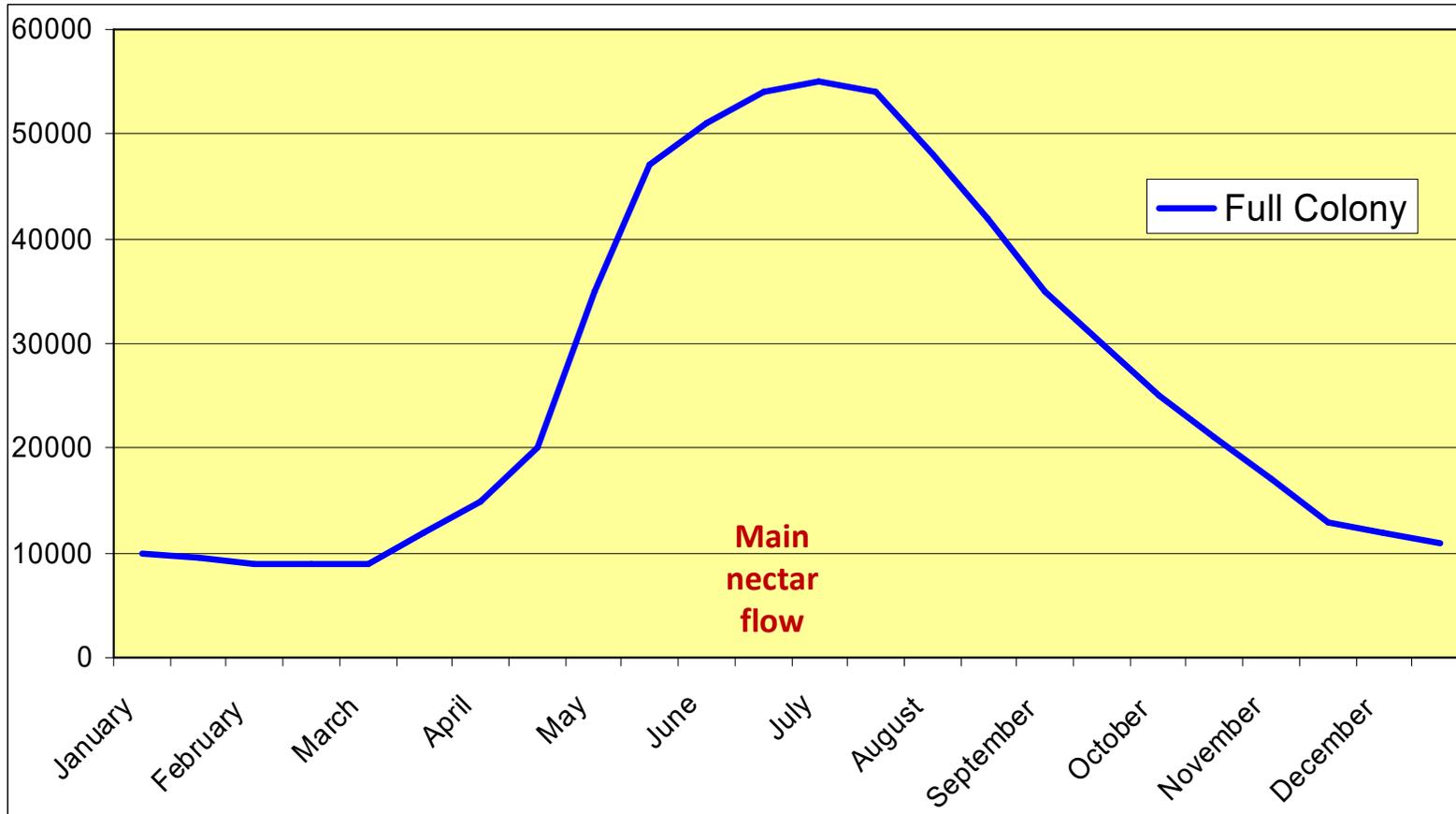
~10,000 workers

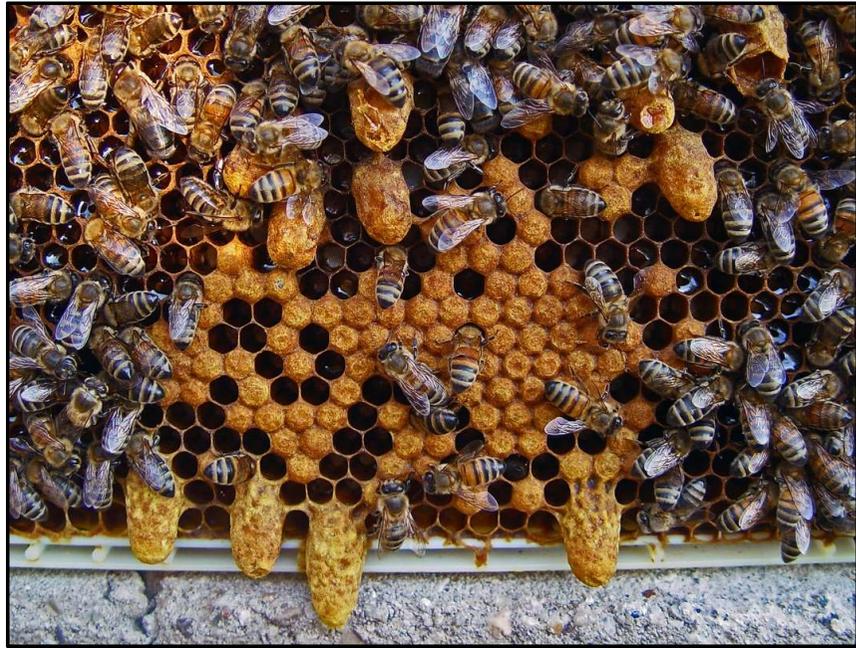
1 queen

0 drones

Courtesy of Clive de Bruyn

Number of bees in a colony





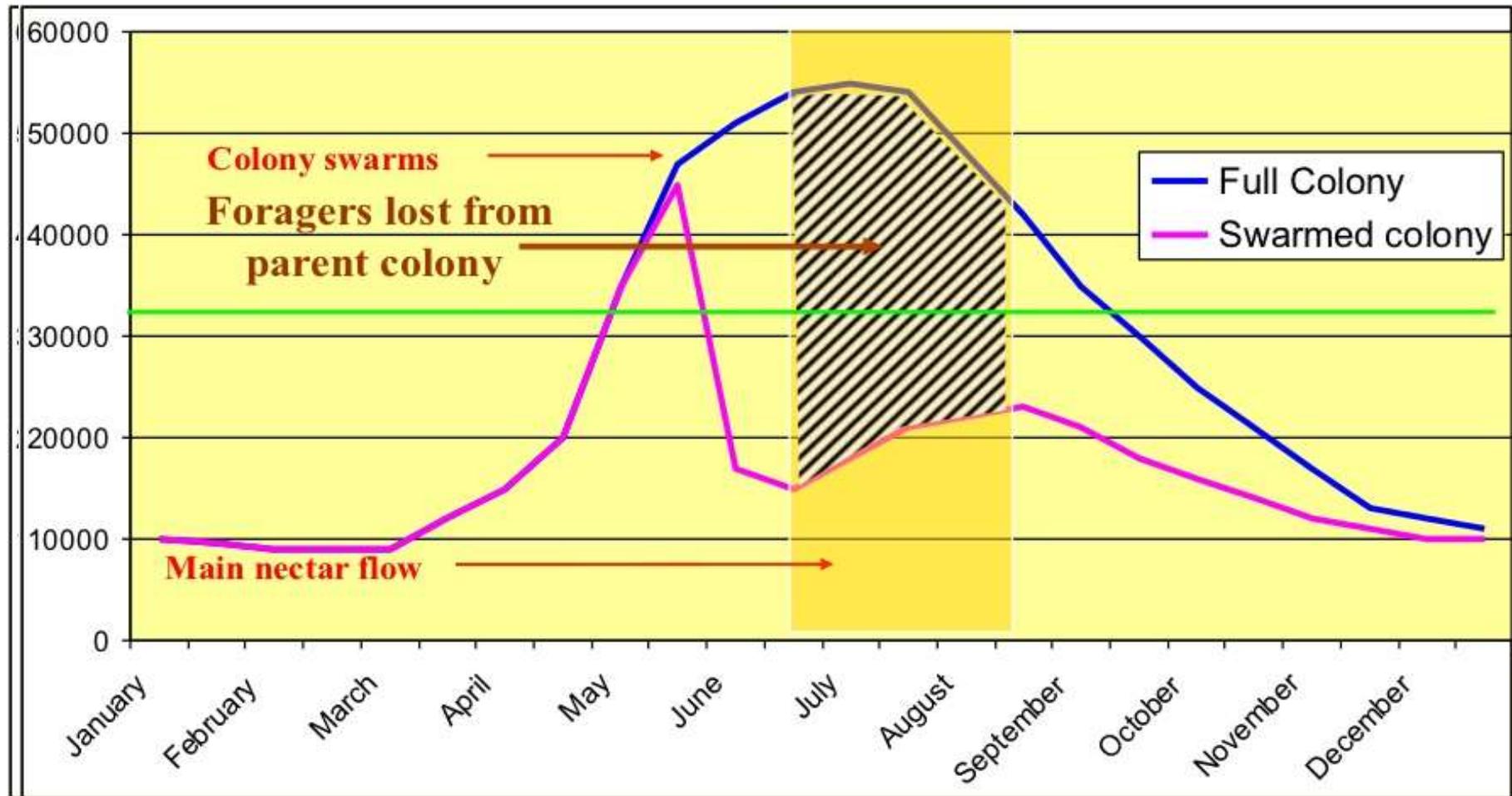
Capped Queen
Cells



Uncapped
Queen Cells



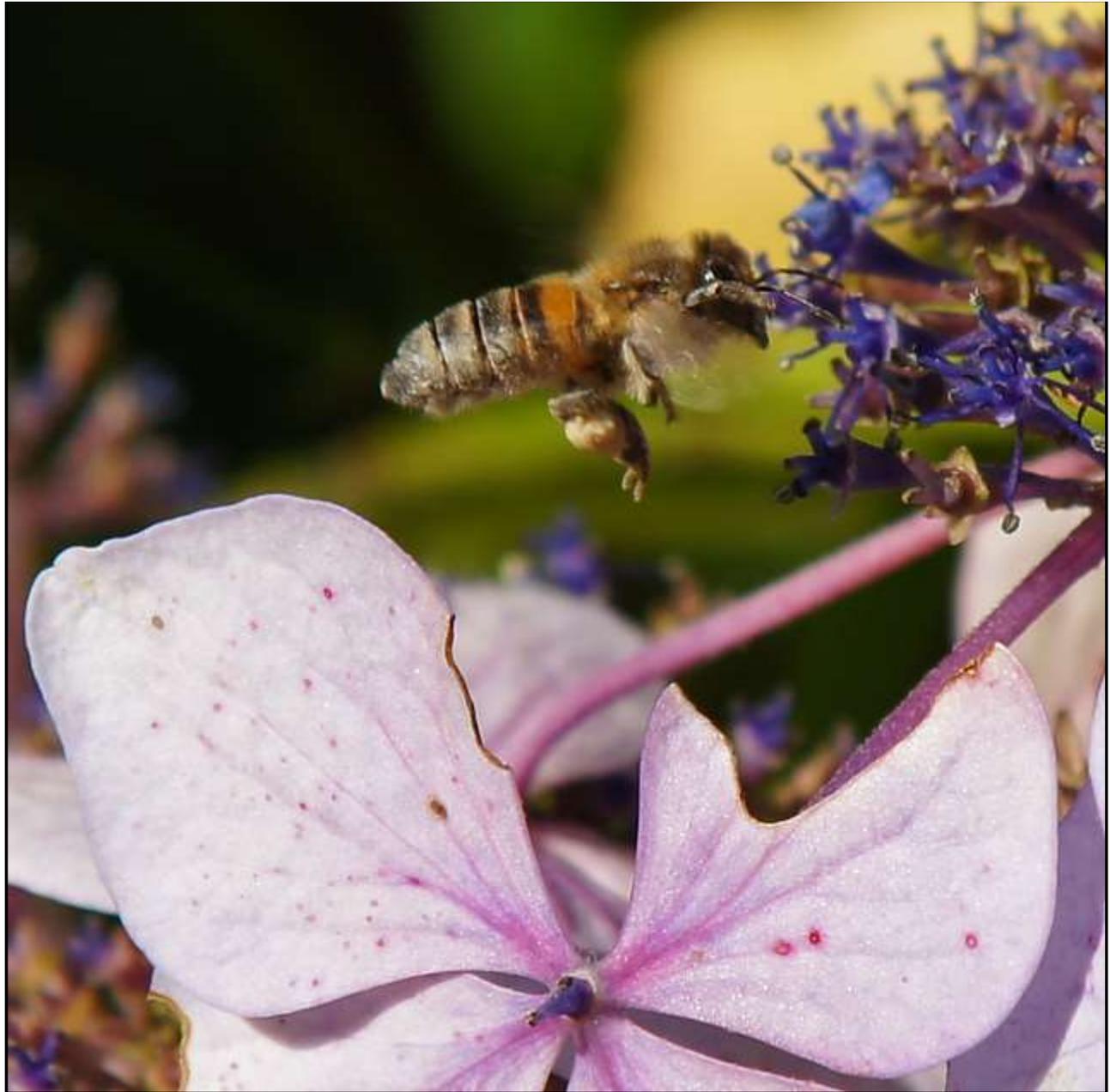






Propolis, bee glue, very sticky antiseptic

- The **shaking dance** is thought to be a grooming request. A worker will stand on the spot shaking her body from side to side until other workers run over and nibble at the propolis and share it around the hive.



Workers - division of labour with age

- 0 - 6 days cell cleaning, general hive cleaning
 - 3 - 9 days feeding the brood
 - 3 - 15 days attending the queen
 - 6 - 18 days honey processing
 - 12 - 20 days wax production and comb building
 - 15 - 25 days hive ventilation
 - 18 - 35 days guard duty
-
- Times they have a significantly higher chance of DYING.
 - 20 days - nectar collection
 - 20 days - pollen collection
 - 25 days - water & propolis collection



- The lifespan of a worker bee is dependent not so much on chronological age as the amount of work she does. Workers have glycogen reserves in their flight muscles which last for approximately 800km of flight; after these are exhausted the bee is unable to create more and will collapse and die.



**Why are
all you
lot
standing
around
doing
nothing?**

- Keeping the babies warm 34-35C
- Standing still and not consuming food.
- **Food sharing**
- Communication about areas in the hive.
- **Pheromone passing**
- Complex understanding about what the thousands are doing and what is needed now and in the short future.
And above all



Food Sharing known as **Trophallaxis**

An ancient Greek word over 5,000 years old, from the words trophi (food) and allaxis (exchange).

A worker bee will
dedicate her entire life
to the wellness of the
hive.

Queen's court and the power of Pheromones



- Her two ovaries are enormous compared to a worker bee's, with each of the ovaries consisting of 150-180 egg producing ovarioles, compared to 2-12 in a worker ovary. Her spermatheca can hold up to seven million sperm, and it usually takes 2-4 years after mating before all the sperm are used up.





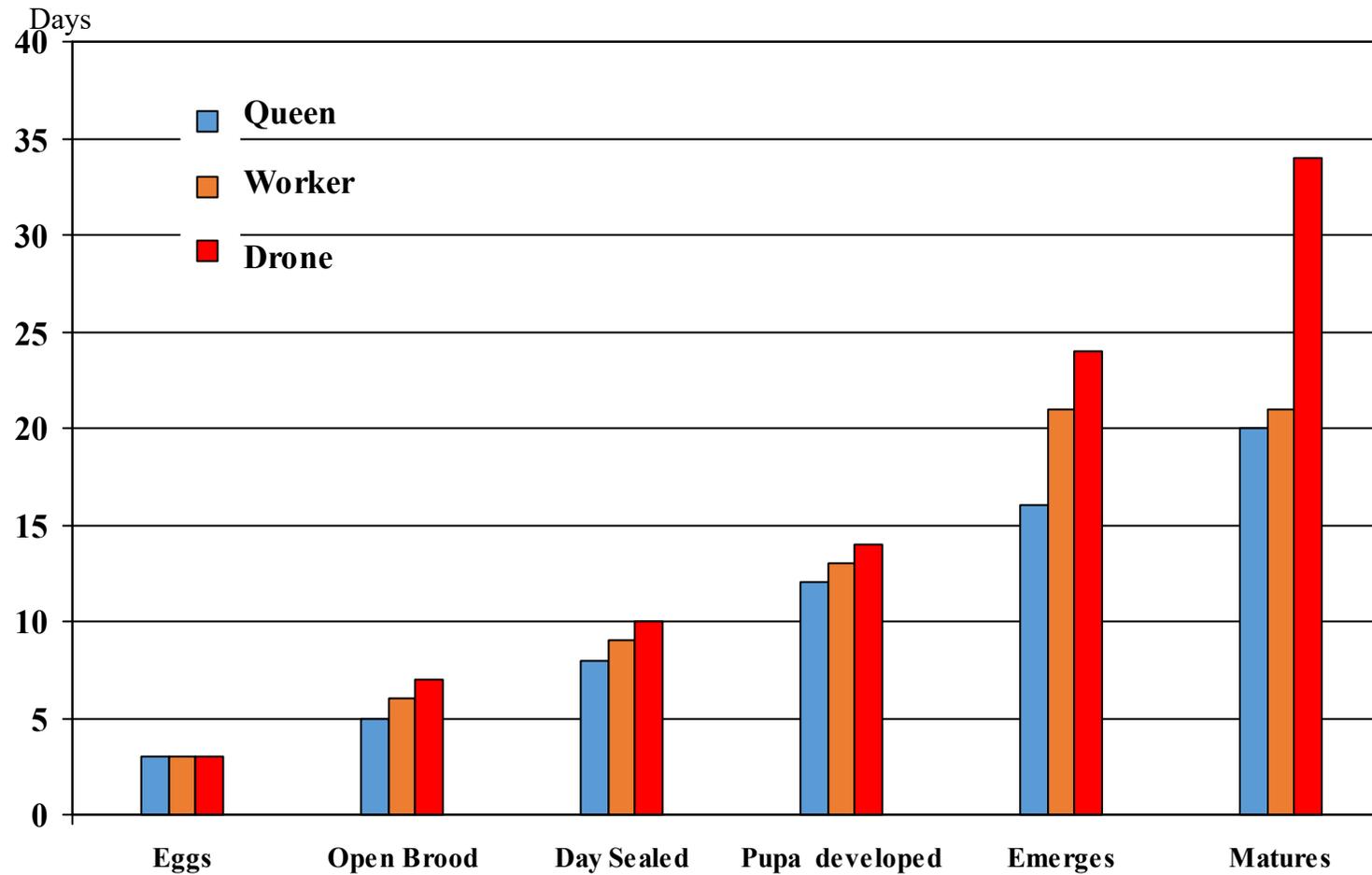
Drone. Bigger than worker. Huge eyes.



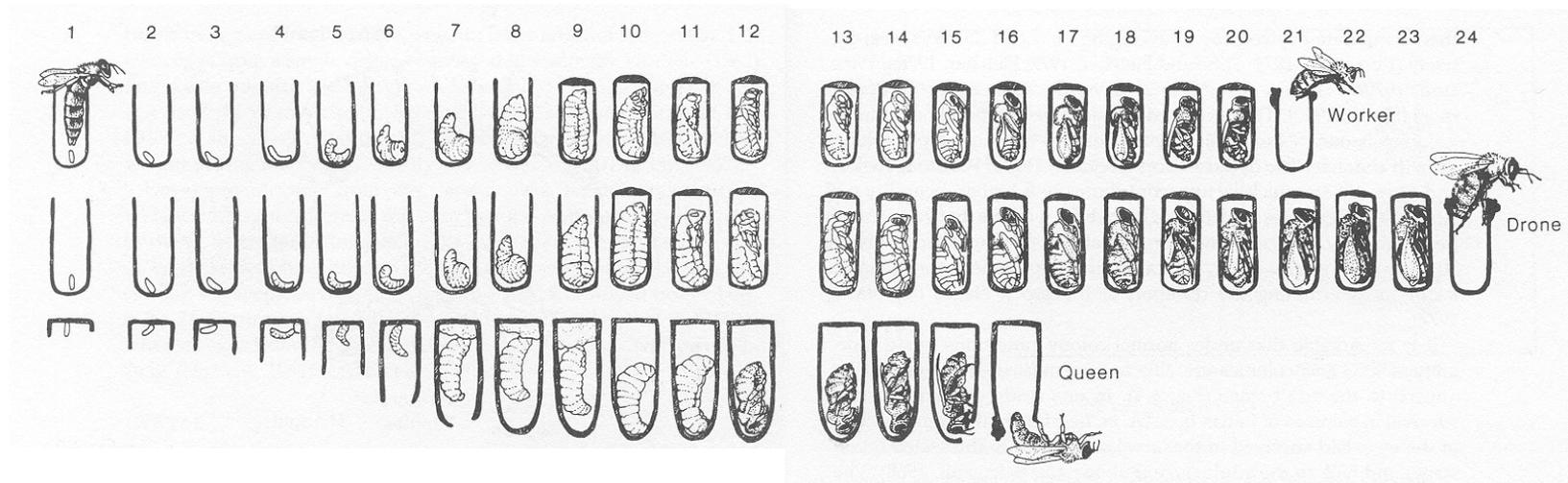




Honey bee - development



Larval development



Ex: Biology of the Honeybee by Mark Winston

NB: Worker and drones are laid in cells that are approximately horizontal whereas queens are laid and developed in cells that hang downwards

Summer & winter bees

- Summer bees
 - Up to 2000 a day
 - 3 weeks
 - Exhaustion
 - Away from colony
- Winter bees
 - About 20 a day
 - Up to 6 months
 - Disease and old age
 - **Adaptation**



- Bees going into winter stuff themselves with food, pack their internal spaces with protein and live for up to 6 months.
- Then they pack themselves around the Queen and ride out the months eating honey as little as possible.

- Even within the depths of the cluster, the worker bees can sense the minutes of daily sunlight beginning to increase following the shortest day of the year, the winter solstice on 22nd December. Within a few days of the solstice, they will slowly begin to raise the cluster to a warmer brood-rearing temperature of 34-35°C. This increase in warmth triggers the queen to begin to lay a small number of eggs.