Lecture 9: The History of Beekeeping

University of Florida
Department of Entomology & Nematology
Dr. Jamie Ellis
Created by: Jason Graham, Catherine Nalen, Jamie Ellis

Fossil Record

~100 mya, during the Cretaceous Period, Angiosperms become the dominant plant.

Honey bees also appeared during this time and foragers collected pollen and nectar from these plants, inadvertently pollinating them.

Bee fossil found in northern Burma, >100 myo

Honey Hunters

The first records of honey hunters are from rock paintings dating back to 15,000 BC.

A honey hunter is one who raids a wild hive opportunistically, but does not own the hive or care for the bees.
How Honey Was Used

Evidence of honey use from 3000-2650 BC in England.

Referred to in Chinese writings around 2000 BC.

Pythagoras (~530 BC) attributed his long life to the constant use of honey.

Mentioned in Homer’s *Odyssey* as a food.

Honey is mentioned in the Bible and other religious texts.
How Honey Was Used
- Food (Egyptian tomb 1450 BC)
- Medicine, external and internal (Sumerian cuneiform, 2100 BC)
- Cosmetics (1550 BC, Egypt)
- To produce alcohol beverages (maybe 2000 BC, Greece)

How Wax Was Used
- Source of light (possibly Egyptian tomb paintings 1567-1085 BC)
- Cult objects (Egypt 2830 BC)
- Facial models (Roman, Pliny, 23-79 AD)
- As seals for documents (Romans possibly started this practice)
- Lost-wax casting (3500-3000 BC in Judean desert)
- Surface finish (in Neolithic potsherd, 3700-3340 BC)
- Painting with beeswax (Aborigines from at least 2000 BC onward)
- Adhesives, dyeing textiles, engraving, pharmaceuticals, cosmetics, preservation

Other Colony Uses
- Bees (and their stings) have been used as a military weapon, punishment, and medicinally since early times.
- Pollen has been used medicinally, as an aphrodisiac, and food.
- Propolis has been used as a medicine, an adhesive to seal cracks, to protect surfaces and even as toothpaste.
- Bee brood has been eaten and even used to make alcoholic beverages.
Honey Hunters

Honey hunting continues to occur today in places such as Nepal. A variety of bee traps used in honey hunting have been found from eastern Europe. (Crane 1999)

Egyptian Mud Hives

In Egypt, beekeepers traditionally used reed mats to make cylindrical mud hives which were stacked horizontally. These hives have been in use from at least 3100 BC (based on hieroglyphics), and are still used in parts of present-day Egypt.

The front would be opened to manipulate brood and queen while the back was opened to harvest honey. (Crane 1999)
Apiary Found in Israel

Bee hives found in Rehov, Israel. They date to around 900 BC (making them almost 3000 years old!).

Asian Rafter Nests

The open nesting *Apis dorsata* was managed on rafters in southeast Asia.

The rafters were built before swarm season.

2-3 months after the bees occupied the rafters, the bees would be burnt or chased away and the honey and wax harvested.

Tree Beekeeping

The next development was the ownership of immovable nests and nest sites (1000 – 2000 BC).

Cultures around the world dealt with nest ownership differently.
- Sometimes individuals owned the nesting site (a tree, cliff, or “bee woods”).
- At other times, villages may own the nesting site(s).
**Tree Beekeeping**

The finder of the hive marked the tree or cavity and waited until the end of summer to collect honey.

Medieval laws discussed ownership rights of nests and related trees.

Tree beekeeping in Europe led to the birth of skep beekeeping and “bee gum” or log beekeeping.

*(Crane 1999)*

**Log Gums**

Log "gums" were cavities in trees (probably already occupied by bees) which were cut out of the tree and moved.

These were usually solid at the top and bottom and may have had doors similar to those used in tree beekeeping.

Keeping log hives is illegal in many U.S. states.

*(Crane 1999)*

In Poland, Russia, Italy, Germany and other parts of Europe, these log hives became a specialized form of folk art.

*(Crane 1999)*
Bark Hives

Bark hives were made in parts of Africa by peeling the outer bark from large trees.

The bark then was sewn shut or fastened using wooden pegs.

Hives were placed in branches of living trees to catch swarms.

After harvesting the products of the hive, the bees usually were destroyed.

(Crane 1999)

Traditional bee hives in Uganda.
Skeps

Wicker was used in many parts of Europe (particularly western Europe) to make basket hives or Skeps.

Skeps often would be covered with mud to help contain the bees. (Crane 1999)

Early Wooden Hives

As early as 1596, wooden hives were found in Italy.

Often these were oriented horizontally instead of vertically.

These hives were positioned with the front (with several entrance holes) to the south while the back was used to open and extract comb. (Crane 1999)

Improvements to Fixed Frame Hives

There were not many considering the primitive state of fixed framed hives.

Hive extension at the back of hives.

Treating a hive to influence comb attachment to it (roughening the side walls of pottery hives, adding wax, pegs, etc.).
Problems in Early Beekeeping

Problem: With early hives, there was always the difficulty of extracting honey and wax without destroying the bee colony (Crane 1999).

Hive Design Improvements

From the development of the Greek hive (mid 1600s) to the “modern” hive (mid 1800s), lots of trial and error passed before a satisfactory hive was developed. The sequence of improvements was:

- Modular hive composed of (1) precision-made tiered wooden boxes which would be fitted tightly together.
- A hive containing some sort of framework to which the bees attached their comb. The goal was to remove combs without damaging them...a result rarely achieved.
- A rectangular or other hive with parallel top-bars placed across the top at the (2) bees’ natural comb spacing so the bees built a comb down from the bar.
- The top bar was (3) extended to make a rectangular frame in which the bees built comb.
- The frames were (4) distanced from the hive walls by the space bees naturally leave.
- A practical, easily workable hive with all 4 essential features, cheap to make, and could be left outdoors.

Movable Frame Hives

Archetypical moveable-comb top bar hive developed in Greece in 1675.

The top bar often was primed with a small bead of wax that was dribbled the length of the top bar. This encouraged comb placement.

The sides typically sloped from the top to the bottom of the hive.

Still used today in some countries.
Early Modular Hives

- Wren’s bee hive, 1654.
- Gedde’s bee hive, 1675.
- Bevan’s bee hive, 1827.
- Nutt’s bee hive, 1832.

Hives in Which Frame Top Bars Were Used

- J.A.’s bee hive, 1683.
- Stewarton’s bee hive, 1683.

Idea remains today with Kenyan top bar hive.

Hives in Which Whole Frames Were Used

- Mann’s bee hives: 1834 (below) – 1851 (left)

Many beekeepers/inventors experimented with different types of movable frame hives.

While they were more effective than their predecessors, these hives still were not efficient.

A common problem with moveable frames was the bees’ propensity to use propolis.
The mid 1800s easily could be called the “Golden Age” of beekeeping due to the many inventions which made beekeeping more efficient.

Rev. L.L. Langstroth

Discovered “bee space” which he incorporated into his removable frame hive.

The frames were separated from all adjacent parts of the hive: the walls of the hive, the floor of the hive, the cover of the hive, and other frames by a 3/8 inch (6.35 mm).

Langstroth published *The Hive and the Honey Bee* in 1853. It still exists today after >40 editions!

40 liters ≈ 10 gallons
Early smokers were either held in the mouth and puffed like a pipe through a hole in the veil (upper left) or large two-handed bellows (lower left). In 1873, Moses Quinby produced the one-handed bellows smoker (rightmost picture).

1857 - Johannes Mehring designed wax foundation with hexagonal indentations (5 per inch) for use in Langstroth's frames. Mills were developed in the 1870's which provided a more uniform foundation. In 1963, Dadant & Sons introduced a wax-coated plastic foundation.
The first centrifugal honey extractor was developed by Major Franz Edler von Hruschka of Austria. A single frame was laid flat and the apparatus was spun by two operators holding a stick through the loop at the top of the extractor. Modern, electric honey extractors are still based on the theories of centrifugal force.

Karl von Frisch published the first research on the dance language used by bees to communicate foraging resources within the hive. In 1973, Karl von Frisch received the Nobel Prize for his achievements in comparative behavioral physiology and pioneering work on insect communication.

Brother Adam, of England’s Buckfast Abbey, travelled over 100,000 miles in search of bees for his breeding program to combat the tracheal mite problem that was plaguing England in the early 1900s. He developed the Buckfast Bee™.

- Efficient pollen gatherer
- Gentle
- Low swarm tendencies
- Resistant to tracheal mites
Other Beekeeping Dates of Interest

1. Face protection
   - 1400 AD - Europe
2. Hand protection
   - possibly 1300 AD - Europe
3. Controlling bees with smoke
   - possibly 2400 BC in Egyptian hieroglyphics
4. Migratory beekeeping
   - at least 250 BC (Greece)
5. Observation hive
   - possibly 1653
6. Honey bees known to be shipped to U.S.
   - 1622 AD

Global Beekeeping

Currently, with some exceptions, much of the world uses Langstroth movable frame hives and similar tools and methods as we do here in North America.

Current Types of Beekeepers

1. Hobbyist
   - 1-19 colonies
   - Generally interested in hive products.
2. Sideliner
   - 20-199 colonies
   - Additional income through pollination.
3. Commercial
   - 200+ colonies
   - Pollination services is generally the primary source of income.
Beekeeping Organizations

- International – Apimondia and the International Bee Research Association
- National bee clubs – American Beekeeping Federation, National Honey Producers Association (both in the U.S.)
- States all have state level bee clubs - Florida State Beekeepers Association
- Within states there are “local” bee clubs – >18 Florida alone!

Beekeeping Press

Bee Culture

Modern Beekeeping

1. Today’s beekeepers face tremendous challenges such as:
   - Africanized bees
   - Colony collapse disorder
   - Varroa mites
   - Wax moths
   - Small hive beetles
   - European & American Foulbrood
   - Pesticide toxicity and more

2. These challenges are eclipsed by the development of shared research, beekeeping associations and a renewed interest in bees as pollinators.
### Additional Reading:


