A 3D Model set by Ken Gilliland

Nature's Wonders

BEEKEEPING

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Nature's Wonders

BEEKEEPING

Introduction

Beekeeping (or apiculture) is the maintenance of bee colonies, commonly in man-made hives, by humans. Most such bees are honey bees, but other honey-producing bees such as Melipona stingless bees, are also kept.

A beekeeper (or apiarist) keeps bees in order to collect their honey and other products that the hive produce (including beeswax, propolis, flower pollen, bee pollen, and royal jelly), to pollinate crops, or to produce bees for sale to other beekeepers. A location where bees are kept is called an apiary or "bee yard".

The Nature's Wonders Beekeeping set includes two types of Beehive boxes with (removable frames), a Smoker, a Bee Tool and Bee Hat (for Dawn). It comes in both Poser and DAZ Studio native versions and support Firefly, 3Delight, Superfly and Iray render engines.

Overview and Use

This set uses a combination of stationary and character-based props. Select **Figures** in the Runtime Folder and go to the **Nature's Wonders Insects / Bees of the World / Props** folder:

- **Models included in this volume:**
  - **Nature's Wonders Beehive** (with 8 removable frames, lid/roof & brick). This is a "parented" prop; always use the Hive Base prop when moving. Additional non-parented individual props, as well as materials, are also included.
  - **Nature's Wonders Bee Hat.** This is a clothing item for Dawn . Use the "Conform to"/"Fit to" command to attach it to the Figure. There are morphs/controls included to alter the size and shape of the crown of the hat. The crown widening morph could to useful in accommodating hair models that don't have a "Hat-Hair" morph.
  - **Nature's Wonders Bee Tool.** This a prop with additional materials included.
  - **Nature's Wonders Bee Smoker.** This a character-based prop with additional materials included. There are morphs/controls included to work the accordion-style pump and change the sizing on the belt attachment.
  - **Nature's Wonders Bee Smoke.** This is a simple sphere prop that parents to the Smoker for simulated stationary "smoke". For creating great-looking animated smoke, it is suggested to get Nerd3D's "Dust and Trail Tool" (sold separately)

History of Beekeeping

From Wikipedia

Humans have been collecting honey from wild bees from at least 10,000 years ago. Beekeeping in pottery vessels began about 9,000 years ago in North Africa. Domestication of bees is shown in Egyptian art from around 4,500 years ago. Simple hives and smoke were used and honey was stored in jars, some of which were found in the tombs of pharaohs such as Tutankhamun. It wasn't until the 18th century that European understanding of the colonies and biology of bees allowed the construction of the movable comb hive so that honey could be harvested without destroying the entire colony.

At some point humans began to attempt to maintain colonies of wild bees in artificial hives made from hollow logs, wooden boxes, pottery vessels, and woven straw baskets or "skeps". Traces of beeswax are found in potsherds throughout the Middle East beginning about 7000 BCE.

Honeybees were kept in Egypt from antiquity. On the walls of the sun temple of Nyuserre Ini from the Fifth Dynasty, before 2422 BCE, workers are depicted blowing smoke into hives as they are removing honeycombs. Inscriptions detailing the production of honey are found on the tomb of Pabasa from the Twenty-sixth Dynasty (c. 650 BCE), depicting pouring honey in jars and cylindrical hives. Sealed pots of honey were found in the grave goods of pharaohs such as Tutankhamun.

> *I am Shamash-resh-uṣur, the governor of Suhu and the land of Mari. Bees that collect honey, which none of my ancestors had ever seen or brought into the land of Suhu, I brought down from the mountain of the men of Habha, and made them settle in the orchards of the town 'Gabbari-built-it'. They collect honey and wax, and I know how to melt the honey and wax – and the gardeners know too. Whoever comes in the future, may he ask the old men of the town, (who will say) thus: "They are the buildings of Shamash-resh-uṣur, the governor of Suhu, who introduced honey bees into the land of Suhu."*
>
> — translated text from stele, (Dalley, 2002)

In prehistoric Greece (Crete and Mycenae), there existed a system of high-status apiculture, as can be concluded from the finds of hives, smoking pots, honey extractors and other beekeeping paraphernalia in Knossos. Beekeeping was considered a highly valued industry controlled by beekeeping overseers—owners of gold rings depicting apiculture scenes rather than religious ones.

Archaeological finds relating to beekeeping have been discovered at Rehov, a Bronze and Iron Age archaeological site in the Jordan Valley, Israel. Thirty intact hives, made of straw and unbaked clay, were discovered by archaeologist, Amihai Mazar, in the ruins of the city, dating from about 900

BCE. The hives were found in orderly rows, three high, in a manner that could have accommodated around 100 hives, held more than 1 million bees and had a potential annual yield of 500 kilograms of honey and 70 kilograms of beeswax, according to Mazar, and are evidence that an advanced honey industry existed in ancient Israel 3,000 years ago.

In ancient Greece, aspects of the lives of bees and beekeeping are discussed at length by Aristotle. Beekeeping was also documented by the Roman writers Virgil, Gaius Julius Hyginus, Varro, and Columella.

Beekeeping has also been practiced in ancient China since antiquity. In the book "Golden Rules of Business Success" written by Fan Li (or Tao Zhu Gong) during the Spring and Autumn period there are sections describing the art of beekeeping, stressing the importance of the quality of the wooden box used and how this can affect the quality of the honey. The Chinese word for honey (蜜 mì, reconstructed Old Chinese pronunciation *mjit) was borrowed from Indo-European proto-Tocharian language, the source of "honey", from proto-Tocharian *ḿət(ə) (where *ḿ is palatalized; cf. Tocharian B mit), cognate with English mead.

The ancient Maya domesticated a separate species of stingless bee. The use of stingless bees is referred to as meliponiculture, named after bees of the tribe Meliponini—such as Melipona quadrifasciata in Brazil. This variation of bee keeping still occurs around the world today. For instance, in Australia, the stingless bee Tetragonula carbonaria is kept for production of their honey.

Early forms of honey collecting entailed the destruction of the entire colony when the honey was harvested. The wild hive was crudely broken into, using smoke to suppress the bees, the honeycombs were torn out and smashed up — along with the eggs, larvae and honey they contained. The liquid honey from the destroyed brood nest was strained through a sieve or basket. This was destructive and unhygienic, but for hunter-gatherer societies this did not matter, since the honey was generally consumed immediately and there were always more wild colonies to exploit. But in settled societies the destruction of the bee colony meant the loss of a valuable resource; this drawback made beekeeping both inefficient and something of a "stop and start" activity. There could be no continuity of production and no possibility of selective breeding, since each bee colony was destroyed at harvest time, along with its precious queen.

During the medieval period abbeys and monasteries were centers of beekeeping, since beeswax was highly prized for candles and fermented honey was used to make alcoholic mead in areas of Europe where vines would not grow. The 18th and 19th centuries saw successive stages of a revolution in beekeeping, which allowed the bees themselves to be preserved when taking the harvest.

Intermediate stages in the transition from the old beekeeping to the new were recorded for example by Thomas Wildman in 1768/1770, who described advances over the destructive old skep-based beekeeping so that the bees no

longer had to be killed to harvest the honey. Wildman for example fixed a parallel array of wooden bars across the top of a straw hive or skep (with a separate straw top to be fixed on later) "so that there are in all seven bars of deal" [in a 10-inch-diameter (250 mm) hive] "to which the bees fix their combs". He also described using such hives in a multi-story configuration, foreshadowing the modern use of supers: he described adding (at a proper time) successive straw hives below, and eventually removing the ones above when free of brood and filled with honey, so that the bees could be separately preserved at the harvest for a following season. Wildman also described a further development, using hives with "sliding frames" for the bees to build their comb, foreshadowing more modern uses of movable-comb hives. Wildman's book acknowledged the advances in knowledge of bees previously made by Swammerdam, Maraldi, and de Réaumur—he included a lengthy translation of Réaumur's account of the natural history of bees—and he also described the initiatives of others in designing hives for the preservation of bee-life when taking the harvest, citing in particular reports from Brittany dating from the 1750s, due to Comte de la Bourdonnaye. However, the forerunners of the modern hives with movable frames that are mainly used today are considered the traditional basket top bar (movable comb) hives of Greece, known as “Greek beehives”. The oldest testimony on their use dates back to 1669 although it is probable that their use is more than 3000 years old.

The 19th century saw this revolution in beekeeping practice completed through the perfection of the movable comb hive by the American Lorenzo Lorraine Langstroth. Langstroth was the first person to make practical use of Huber's earlier discovery that there was a specific spatial measurement between the wax combs, later called the bee space, which bees do not block with wax, but keep as a free passage. Having determined this bee space (between 5 and 8 mm, or 1/4 to 3/8"), Langstroth then designed a series of wooden frames within a rectangular hive box, carefully maintaining the correct space between successive frames, and found that the bees would build parallel honeycombs in the box without bonding them to each other or to the hive walls. This enables the beekeeper to slide any frame out of the hive for inspection, without harming the bees or the comb, protecting the eggs, larvae and pupae contained within the cells. It also meant that combs containing honey could be gently removed and the honey extracted without destroying the comb. The emptied honey combs could then be returned to the bees intact for refilling. Langstroth's book, The Hive and Honey-bee, published in 1853, described his rediscovery of the bee space and the development of his patent movable comb hive.

The invention and development of the movable-comb-hive fostered the growth of commercial honey production on a large scale in both Europe and the US.

Langstroth's design for movable comb hives was seized upon by apiarists and inventors on both sides of the Atlantic and a wide range of moveable comb hives were designed and perfected in England, France, Germany and the United States. Classic designs evolved in each country: Dadant hives and Langstroth hives are still dominant in the US; in France the De-Layens trough-hive became popular and in the UK a British National hive became standard as late as the 1930s although in Scotland the smaller Smith hive is

still popular. In some Scandinavian countries and in Russia the traditional trough hive persisted until late in the 20th century and is still kept in some areas. However, the Langstroth and Dadant designs remain ubiquitous in the US and also in many parts of Europe, though Sweden, Denmark, Germany, France and Italy all have their own national hive designs. Regional variations of hive evolved to reflect the climate, floral productivity and the reproductive characteristics of the various subspecies of native honey bee in each bio-region.

The differences in hive dimensions are insignificant in comparison to the common factors in all these hives: they are all square or rectangular; they all use movable wooden frames; they all consist of a floor, brood-box, honey super, crown-board and roof. Hives have traditionally been constructed of cedar, pine, or cypress wood, but in recent years hives made from injection molded dense polystyrene have become increasingly important.

Hives also use queen excluders between the brood-box and honey supers to keep the queen from laying eggs in cells next to those containing honey intended for consumption. Also, with the advent in the 20th century of mite pests, hive floors are often replaced for part of (or the whole) year with a wire mesh and removable tray.

In 2015 the Flow Hive system was invented in Australia by Cedar Anderson and his father Stuart Anderson, allowing honey to be extracted without expensive centrifuge equipment.

Special Thanks to:

.. to my beta testers, FlintHawk and Carey

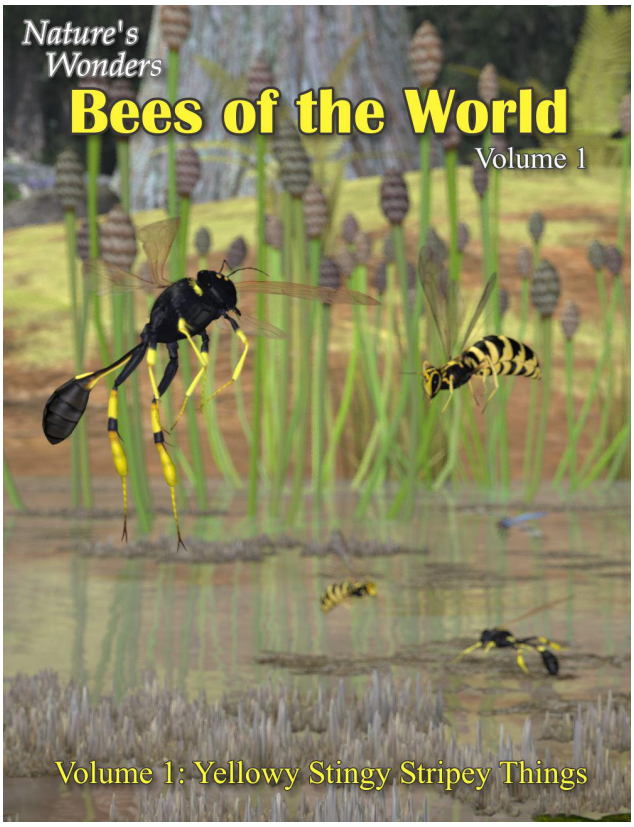
Sources:

Wikipedia (https://www.wikipedia.org/)

Other Resources:

This set is being released at the same time as two other “like” sets:

- Nature’s Wonders Bee. The base model set for the Nature’s Wonders Bee. This set includes the model and a Queen, Drone and Worker for the Western Honey Bee.
- Nature’s Wonders Bees of the World, Volume 1. This set includes six species from the *Apoidea* superfamily (a bumblebee, cicada killer, mud dauber, wasp, hornet and yellowjacket) (Nature’s Wonders Bee Base set is **required** for this set to work).

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