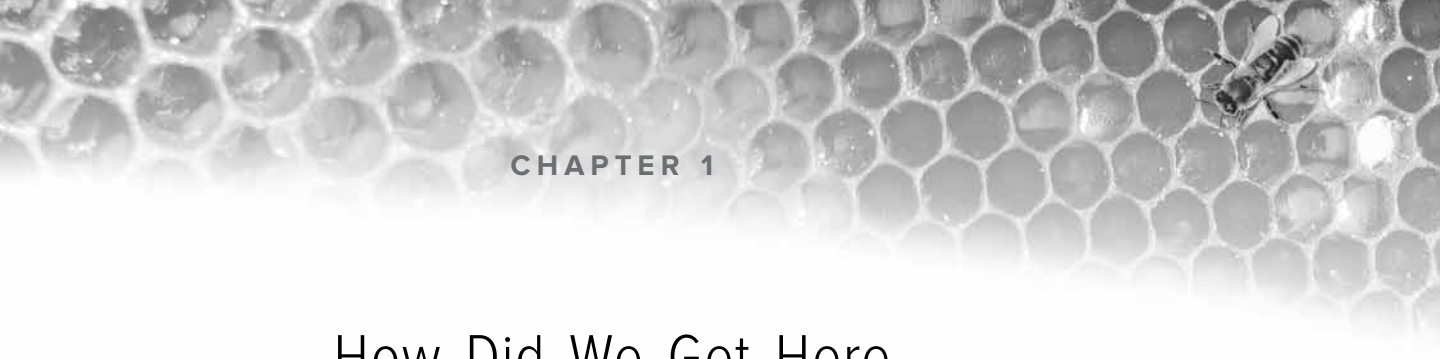


CHAPTER 1

# How Did We Get Here From There?

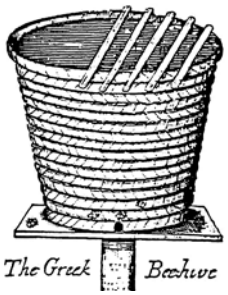
Humankind's interaction with bees spans many thousands of years. But the relationship has not always been as one-sided as it is today.

Ancient civilizations were *honey hunters*—collecting honey from beehives discovered in the wild. Often this included physically destroying the hive in order to gather the honey.

At some point, humans began attempting to domesticate the honeybee. While the idea of actually taming a honeybee is a bit cheeky, people did manage to convince bees to live in containers or cavities of our choosing, in locations that we selected. These containers became known as beehives, and they included such things as hollow logs, pottery vessels, wooden boxes and woven straw baskets.

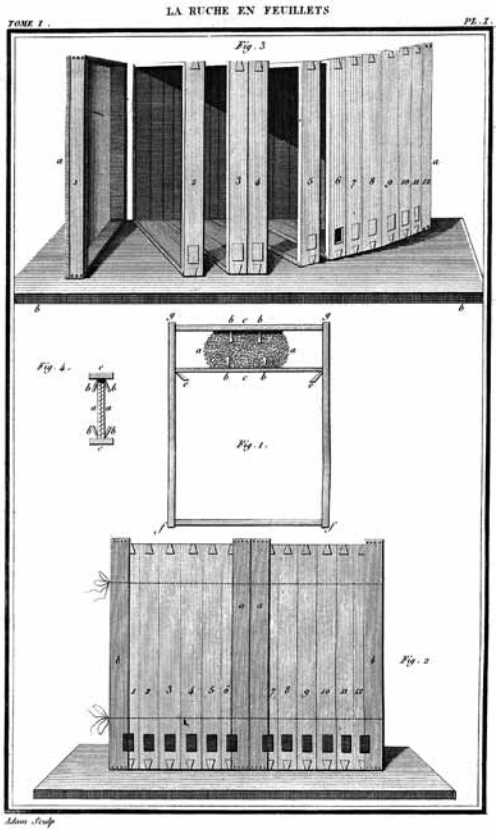
The ancient Egyptians were probably the first culture to maintain bees in artificial hives. They floated barges carrying clay hives up and down the Nile River where flowers were plentiful. The bees would forage along the river during the day, and then the barges were drifted down the river at night following the source of food as new flowers bloomed through the season. It is said that archeologists found sealed pots of honey that were still edible in the tomb of King Tut (1341 BC–1323 BC).

Thirty intact beehives (circa 30 BC) were found in the ruins of the Jewish city of Rehov. The hives were made of straw and unbaked clay and arranged




**The original top bar hive.**

Credit: John Caldiera. "American Beekeeping History—The Bee Hive." *John's Beekeeping Notebook*. [online]. [cited July 26, 2012]. outdoorplace.org/beekeeping/history1.htm.




**Francis Huber's leaf hive.**

Credit: Plate of leaf hive from Huber's *New Observations Upon Bees*, X-Star Publishing, Copyright 2012 by Michael Bush.

in rows. This places beekeeping and a fairly advanced honey industry at the time of the Bible, about 3,000 years ago.

The first top bar hive—a movable comb hive—is said to have been in use in Greece in the 1600s AD. The bars were placed across a container, like a basket, and spaced so that the bees drew their combs in such a way that they could be safely lifted out and inspected. Francis Huber is credited with developing the first beehive with movable frames in Switzerland in 1789. Known as the Leaf Hive, the frames of the hive were hinged at the back and could be turned like the pages (leaves) of a book. It was Huber's hive that led the Reverend Lorenzo Lorraine Langstroth to feel confident that it would be possible to build a hive that would allow for the inspection of the hive without "enraging the bees."[1]

In the mid-1850s, Reverend Langstroth designed a hive with removable, self-spacing frames that worked in correlation with the concept of *bee space*—the ⅜ of an inch that bees need in order to move between the combs. Where there are areas in the hive that are larger than ⅜ of an inch the bees will fill those spaces with comb, and areas less than ⅜ of an inch will be closed up with *propolis*.

Controlling the spaces between the frames made manipulating the contents of the hive a simpler matter for the beekeeper—leading to greater so-called efficiency in beekeeping.

In Langstroth's own words:

> …the chief peculiarity in my hives…was the facility with which these bars could be removed without enraging the bees.… I found myself

> able…to dispense entirely with natural swarming, and yet to multiply colonies with much greater rapidity and certainty than by the common methods. I could, in a short time, strengthen my feeble colonies, and furnish those which had lost their Queen with the a means of obtaining another. If I suspected that any thing was wrong with a hive, I could quickly ascertain its true condition, by making a thorough examination of every part…[2]

**The original Langstroth Hive.**

Credit: John Caldiera. "American Beekeeping History—The Bee Hive." *John's Beekeeping Notebook*. [online]. [cited July 26, 2012]. outdoorplace.org/beekeeping/history1.htm.

Langstroth's frames supported the comb on four sides, so there was less risk of breaking the comb when it was being handled and inspected. By the end of the 1800s most North American beekeepers were using some variation of the Langstroth hive.

In the early 1920s, Rudolf Steiner gave a series of lectures entitled *Bees*.[3] He was very concerned about the level of manipulation and mechanization that was occurring in the beekeeping world, even though it tended to make beekeeping far simpler as an industry. His concerns, even then, included:

- the use of ready-made combs, i.e. foundation
- the manipulation of queen bees
- using worker eggs to manufacture queen bees
- striving to thwart the natural swarming/reproductive impulse of bees
- monocrop agriculture
- moving hives to pollinate crops
- the use of chemical fertilizers
- the use of pesticides.

Steiner viewed all these things as meddling with natural systems, and as posing risks and detriments to the health and sustainability of both bees and agriculture.

One lecture in 1923 is notorious for a conversation that occurred between Steiner and a beekeeper by the name of Mr. Muller. In this conversation Steiner stated that the artificial queen breeding methods that were being developed at the time would cause serious bee collapse within one

hundred years. Mr. Muller did not agree. All indications seem to say that Rudolf Steiner was spot on with his concerns, as well as with the timing of his prediction.

## Forward, into the Future of Food

Significant events in recent history have influenced the world of bees and agriculture. Here are some of them:

### The Products of War

The use of chemical fertilizers and pesticides arose from the aftermath of two World Wars. Fritz Haber, the German Jewish chemist who discovered the means of synthesizing nitrogen, forever changed the fertility of the planet. Haber also developed the cyanide-based pesticide, Zyklon A, which was later adapted as Zyklon B, the gas used by the Nazis in concentration camp gas chambers.

"As the Indian farmer activist Vandana Shiva says in her speeches, 'We're still eating the leftovers of World War II.'"[4]

### Big Agriculture

In 1971, US President Richard Nixon appointed Earl "Rusty" Butz as the Secretary of Agriculture. With Earl's aggressive encouragement to "get big or get out," US farmers bought heavily into the ideas that big was better — that monoculture was a more efficient method of growing food — and that the chemically induced increase in yield that monoculture created (which was fortified and protected by the products of war — chemical fertilizers and pesticides) would one day feed the world.

Big Ag promoted monoculture farming practices as better and more efficient. But in reality, monoculture practices destroy the critical balance between soil, water, livestock, crops and pests — the very features that keep agriculture alive. Today any system that does so much damage to itself instantly earns the moniker "unsustainable." The damaging effects of Earl Butz's policies are still being felt today.

### Systemic Neonicotinoid Pesticides

After years of traditional pesticides, a completely new class of pesticides—systemic neonicotinoids—came on the scene in the 1990s. These were not without their supposed advantages; after all, they were intended to reduce the amount of toxic chemicals being sprayed on plants, and this they did.

And that sounds like a good thing…instead of being sprayed on the developing plant, a systemic pesticide is painted on the seed of the plant. As the plant grows, the pesticide is in the very tissue of the plant, not just on the plant—in other words, you can't just wash it off. The use of systemic neonicotinoids also means that their poisons are in the nectar and the pollen of the plant—the part that constitutes bee food.

### Outmoded Testing Methods

The methods currently in use to test this new, insidious type of pesticide have proven to be woefully inadequate for measuring the danger to honeybees. The current methods don't take into account the possibility of delayed responses to the pesticides, or the concept of *sublethal effects*—effects that damage but don't necessarily kill the honeybee. Any effect is relevant when one considers the interconnectedness of our food system and these important pollinators.

### Genetically Modified Organisms

Bees and beekeepers now have to contend with another worrisome thing—genetically modified organisms (GMOs). The audacity of patenting a plant completely astounds me—along with the frightening implications of creating a plant that has been genetically altered in order to withstand pests and pesticides. The methods used to genetically alter plants could have deep implications on our health and on the future of the planet.

A battle currently being fought in Washington concerns the legal requirement to label GMO food, and I encourage thinking people to educate themselves on this important topic as it evolves.

### Our Broken Food System

Michael Pollan, in *The Omnivore's Dilemma* and in *The Botany of Desire*, eloquently illuminates the fundamental brokenness of our food system.[5] He defines the 1,500-mile salad, does the math on the grossly inefficient use of fossil fuels in producing food, discusses the wacky sex life of corn and describes in vivid detail the effect that government-subsidized overproduction of this one mutant grass has had on the US farming economy — even though it does not require honeybees for pollination!

## And now, Back to the Bees

In late 2006, news broke of a frightening problem happening with honeybees — a small insect so completely crucial to our food system that our lives literally depend upon its existence.

This problem with bees was named *Colony Collapse Disorder*, and it quickly became a major focus of the bee research community. It garnered a snazzy abbbreviation — CCD — and was soon a major buzzword in the media.

The primary symptom of CCD is frighteningly strange. Let me try to make it clear just exactly how strange it is.

First you must understand that bees sting in order to defend two treasures: their *brood* (baby bees) and their food (honey). And since when a honeybee stings, she dies — obviously to the bees, these two things are of life-or-death importance.

But when a colony collapses, the adult bees simply disappear. What the beekeeper finds is a hive containing brood and food, but no adult bees. The bees have abandoned the two things most important to them.

This also means that there are no dead bees — no bodies to study. They're just gone, having left behind all those babies and all that honey. It's eerie and almost too weird to contemplate.

In the years that have elapsed since 2006, bee researchers have gradually concluded that the cause of CCD cannot be pinned on any one single thing — one pesticide, one fungus, one virus, one parasite — but that CCD

is caused by combinations of stressors breaking down the bees' natural systems. CCD is truly an indication that the bees have reached the limit of their ability to withstand the stress of the manipulations and mechanization that they've been subjected to.

For industrial beekeepers, especially large-scale migratory pollinators, Colony Collapse Disorder has been a devastating fiscal tragedy, not to be wished on anyone. And I have never, ever met a beekeeper — commercial, backyard or otherwise, who did not love their bees — so there is personal heartbreak as well in every vanished colony.

But on a different note, it could be that CCD is an opportunity for eaters and beekeepers everywhere to awake from a strange and mind-numbing slumber…and for us all to realize that

- big is not necessarily better.
- faster is not necessarily a good thing.
- more is not necessarily the goal.

And as bad as all this doom and gloom is, doesn't it also impart a sense of hope?

It does for me — because CCD points out a very, very important thing…

We don't have to find a cure for CCD — we just have to stop causing it!

And we can do that by respecting and working with the natural systems that are part of our food system, and at work inside the beehive.

*When one tugs at a single thing in nature,*
*one finds it attached to the rest of the world.*

« John Muir »