

## 1: Subspecies: The Place of Honey Bees in the World - eXtension

*The Place of Honey Bees in the World. The honey bee managed in North America is the western honey bee *Apis mellifera* L. The generic name *Apis* means "bee-like," and students of Romance languages will note in the specific name *mellifera* echoes of the word "honey." Thus the Latin translates loosely to bee-like-honey-loving-insect.*

The Importance of Bees The bees place in our world is important beyond our understanding. The small little insect that works so tirelessly and quietly around us certainly is one of the reasons, if not a main reason, for the possibility of human development on earth. Without them, the development of life on earth, as we know it now, would have been much different and the conditions for human development may not have existed. The conditions we are talking about here are the appearance of the flower bearing plants and pollinators, with the bees, being the crown jewel of the pollinators. The bees, the flowers, human beings and everything that developed alongside humans are all an interconnected series of events over an enormous amount of time. In the writings, artwork and symbolism of cultures and religions around the world from time immemorial are references to the bees and the substances they collect in Nature and make in their bodies, namely honey, bee pollen, bee propolis, royal jelly and wax. These substances, along with the bees and the beehive, have been held in high esteem throughout human history in every part of the world. The references are almost always of renewal, rebirth and new beginnings. The references are almost always about the good, positive, reinforcing things of life. They are gifts and blessings. Indeed, perhaps the beauty in flowers was developed as a mechanism to attract pollinators and lure them in their direction. The bees diet is flower based collecting pollen and nectar from the flower. Much of our diet is flower based in the fruits, nuts, seeds and vegetables we eat that the bees pollinate. Flowers represent and symbolize the very definition of beauty on earth. The colors of every kind and fragrances of flowers cannot be reproduced. They can only be imitated. It is Nature and it is complex. That is where the bees go to work for their food. I exploit them too much, I think. Even these insects have certain responsibilities, they work together very nicely. They have no constitution, they have no law, no police, nothing, but they work together effectively. This is because of nature. Similarly, each part of a flower is not arranged by humans but by nature. The force of nature is something remarkable. We human beings, we have constitutions, we have law, we have a police force, we have religion, we have many things. But in actual practice, I think we are behind those small insects. This has taken place over immense amounts of time and countless numbers of eating species. Everything is preying on the things it can prey on. Taking life for one living thing to live and another living thing to die. Most all the eating species have evolved by the actual demise of other things. The metaphor here is, even the strongest die and become fodder for the weakest or lowest on the food chain. Nothing wrong with it. It is just the way it is. Their relationship with their world is one of benefit and enhancement. The bees relationship with the plants it visits is mutually beneficial. The consequence of this relationship is the bees make more flowers by cross pollination which, in turn, makes more food produced from those plants. This is a statistically unique place the bees occupy. The bees do not harm. How unique is that!? Everyone knows of the bees but few people actually know much about them. In fact, the bees and the substances they collect have been forgotten or downgraded in the industrial and agricultural applications and salesmanship of the present day world. They are more an afterthought of little importance to most. Could all the reverence of tribes and cultures, north and south, east and west, from the beginning, could they have been all wrong? Do we know more now? It probably boils down in large part to the fact that, the industrialized world operates on patents, or exclusive ownership of things for profitability. Anybody can own a beehive. It is non patentable and non exclusive. The industrialized world has no use for the beehive or the development of its products. The pollen from the flower is the genetic material of the plant. This pollen is the basic primal energy representing one of the most powerful urges in nature, that is, the urge to reproduce. It is the culmination of the life force of plants. This life force, when unleashed through cross pollination largely done by the bees, is the beginning of much of the foods that insects, birds, other animals and humans have developed on. Bee Pollen is a biodiverse, complex substance of plant material that when a chemical analysis is done, it shows a wide array of components in the minerals, vitamins, proteins, enzymes

and due to the complexity shown in nature, plenty of other things not yet identified by science. This biodiversity is represented by the bees visiting hundreds, if not thousands of different flowers of different species of plants. The bees gather pollen and nectar in the valleys, up the mountains, in the backyard, down the street, red flowers, blue, purple, white flowers. Where there are flowers you will find bees. These phytochemicals of plant origin, pollen and nectar, inheritantly contain a broad spectrum of components. Go to Arizona, go to Uruguay, go to Sweden and Mozambique. The bees are collecting pollen and nectar in all these places from countless flowers, all different. This is called biodiversity. Bee pollen is possibly the most biodiverse substance on earth. The combined chemical composition of all those plants makes for a complexity and synergy that only nature can produce. In the creation of floral pollen there are precipitated, as it were, crystals of prana. Without frivolity one can say that in flowers the Heaven settles down upon earth. If the earth were deprived of flowers, half its vitality would disappear. We live in a world of mega agri-industry, mega pharmaceutical drug companies and processed to the maximum foods. The demands on these industries call for sameness. The companies produce and the public demands, sameness. When you buy something now you want it to be the same as last time. When we buy food or drugs or vitamins in New York we want it to be the same when we buy them in Los Angeles or Flagstaff. Synthetics is one way to make sameness possible. Certain ways of processing make sameness possible. Singling out one ingredient, taking it out of a whole food substance that it came from, is another way to make sameness possible. Synthetics, over processing and the single isolated ingredient processing methods of food and pharmaceuticals, have taken over these industries, in many cases to our detriment. These processes take us down a road that goes directly against the natural world we live in. In nature, there are many parts and pieces to everything that collectively make a whole. These parts and pieces are all interrelated and exist as one organism, not as separate, stand alone substances. Nature is not a stand alone situation. Taking one of those pieces out and making it a stand alone situation is how the modern industrial world works. That equates to sameness. There are many good arguments for sameness and it is necessary in many instances but as we move into the future it will become harder and harder to find the biodiverse, complex substances that are the real representatives of nature. We need these whole complex substances like bee pollen, propolis, royal jelly and honey to help keep a balance against the overpowering pathways that industry and commerce is taking us down. Their salesman are everywhere touting their goods. There is an unnatural world and a world of total sameness. Nothing in Nature is ever the same, no snowflake, no plant, no animal or human being is the same. Everything, at the very least, has slight variations. Propolis and Honey Complex and Diverse This diversity also manifests itself in bee propolis and honey. Propolis is another complex primal material from the plant world. The bees gather sap from trees and bushes. Propolis is principally sap, which is tree resin, and beeswax with small amounts of pollen. The resin is the fluid that moves through the plant. This fluid is essentially the immune system of the plant and when these resins are compromised, by unfavorable weather conditions such as drought, the plants exist in an unhealthy state. The bees collect this resin, convert it into propolis and have various uses for it inside the beehive, not the least of which can be described as a part of the internal immune system of the beehive. Bees take the immune system of the plant life they visit and use it as part of their own immune system inside the hive. Again, propolis is a highly complex, biodiverse compound of numerous plants combined to make a substance the bees use to combat bacterial growth and the spread of disease in the highly populated environment of the beehive. It must be effective because the bees have existed for at least million years and have had to combat numberless threatening conditions over that span of time. By using these products of the beehive, humans are bringing the variability of plant life and nature into their own being. A bee leaves the darkness of the beehive, goes out in the light of day, and flies over the ground until she gets to this beautiful flower, lands on the flower and goes inside. What could be better than that?

## 2: The Importance of Bees

*THE PLACE OF HONEY BEES IN THE WORLD CHAPTER 1, FIRST LESSONS IN BEEKEEPING Above photos from [www.enganchecubano.com](http://www.enganchecubano.com)*

The decline of the honey bee population in recent times has been a subject of serious discussion around the world for the last several years. Through a joint effort with the community we hope to help rescue, restore, and rebuild at least some of the bee population, as well as help educate others about the importance of these unique and much needed creatures. Our goal is to offer assistance to anyone wanting to get involved in the age old art of beekeeping by providing the basics needed to get them started. Listed below are the honey bee related products and services we offer to help keep existing bees from becoming statistics and also help those with crops in need of pollination, satisfy their needs safely and effectively. By educating the public, helping newcomers get started in beekeeping, offering pollinating services where they are needed, providing bees and supplies for beginners as well as experienced beekeepers, we hope to contribute by doing our part to keep the beloved honey bees off the extinction lists. We are developing a Beekeepers Mentor Network to facilitate the process of making adequate educational development accessible to everyone. Through education and observation, the gratification of understanding can be achieved. We offer honey bees of a gentle nature and top quality genetics. Depending on the season and what we have in stock, we offer a variety of options including starter Nuc colony nucleus , full colonies and queens when available. Please visit our Honey Bees For Sale page for prices, options and availability. Ask about our lease options for community garden pollination and Agricultural Valuation aka Ag Exemption purposes. Beekeeping Basics - Group and Private Classes We offer group classes that provide the basic information and instructions needed to get started in beekeeping. Honeybees for adults and youth as well. Bees can be fun for the entire family to experience and enjoy. Advanced and private lessons are by appointment only. The standard 10 Frame Langstroth style hives are the most common, so that is what we recommend and use in our own yards. These are the type we have most readily available, but we also offer the Langstroth 8 frame equipment if needed. We do not have a store for "walk in shopping", therefore all equipment and bee pickups are on scheduled pickup dates or by appointment only. Many crops benefit and produce at a much higher rate when honey bees are introduced to the fields when the crops are in bloom. We understand this need by fellow farmers, but we also value our bees, so only offer Pollination Services to chemical conscious farmers. Anyone requesting our bee pollination services must be operating a pesticide free environment and sign a contract agreeing to meet this requirement. Meaning, if and when chemicals are to be used on the farms around or near the bee yards, ample notice will be given so the bees can be relocated beforehand. Pure Honey - We offer a variety of pure golden sweetness As the bees gather the nectar from the wildflowers, the clover, or the mesquites and even the highly sought after huajilla blooms, they all offer their unique flavors and colors in the honey they produce. Some say the huajilla honey actually has healing properties. We have bees in more than one area, so we have "local honey" from multiple counties. Contact Us to find out what we currently have available. Apiary Maintenance - Honey Bee Hive Management Services We offer hive maintenance services for your bees on your property that are there to pollinate the crops, gardens, flowers and trees in their area as well as produce honey. As part of this service, we have Bee Hive Kits and Supplies to get started or upgrade equipment. We also offer to help manage hives for customer that may have special needs or be physically unable or even be away on travel for extended periods. In either case, we offer a maintenance agreement to monitor and maintain the hives to what ever extent is right for the customer. These range from Arthritis to Lyme Disease and have been helpful for many years. Small quantities of BVT Bees can be purchased for using in treatments. Please use the Contact Us page to inquire about custom size orders. We are registered with and permitted by the Texas Apiary Inspection Service. We service south and central Texas and will consider other areas as well. Contact us or click below for more information and to see photos of removal work in progress and bee supply options.

## 3: How Bees Benefit Other Living Things - One Green PlanetOne Green Planet

*THE PLACE OF HONEY BEES IN THE WORLD is a PPT slideshow by Dr. Kristen Healy, Entomology Specialist with the LSU AgCenter. This PPT describes the classification of honey bees, the origin of honey bees, and the common types of bees.*

Environment The Seven Different Types of Honey Bees Several threats face the honey bees of our world but it is first important to learn how many species actually live in this world today. Honey bees are members of the genus *Apis*, famous for the production and storage of honey and the usage of wax to create colonial nests. Currently, seven species and 44 subspecies of honey bees are known to inhabit the world. The most common among the seven species is the Western honey bee that is found in all continents with the exception of Antarctica. It has also been domesticated for the production of honey and the pollination of crops. Only members of the genus *Apis* are known as the true honey bees. However, some other closely related bees are also known to produce honey. Melittology is the study of honey bees.

*Apis nigrocincta* The *Apis nigrocincta* is a honey bee species living in the Philippine island of Mindanao, Sulawesi, and Sangihe in Indonesia. Little is known about the biogeography of this species. In Sulawesi, most of the colonies of this honey bee are found at elevations above meters. The bees build medium-sized cavity nests with multiple combs that are nearly equidistant from each other. The nesting sites are close to the ground. Two types of combs are found with the smaller being for the workers and the larger ones for the drones. Cells for the queen are found towards the lower edges of the combs.

*Apis mellifera* The European honey bee *Apis mellifera* or the western honey bee is the most common among the honey bee species of the world. Like the other honey bees, the European honey bee is also highly social in nature. It was one of the first insects to be domesticated and it the most common honey bee reared by beekeepers for their honey and role as a pollinator. The honey bee is currently found in all continents with the exception of Antarctica. The honey bee is threatened by a number of factors including pests and disease.

*Apis koschevnikovi* *Apis koschevnikovi* is a honey bee species that is found in the Borneo island of Indonesia and Malaysia. The bees are all dark and brown banded. The queen and the drones have light brown bands on the abdomen while the workers have light orange abdominal bands. Within their range, the bees inhabit tropical evergreen forests. Habitat destruction due to clearance of land for plantations is the biggest threat to the survival of these bees. The bees live in small colonies in few combs within the tree cavities in the forests. It is a nectar-feeder and an important pollinator in its habitat.

*Apis cerana* The Asiatic honey bee *Apis cerana*, also known as the eastern honey bee, is a honey bee species that lives in southeastern and southern Asia. The bees build nests with multiple combs in cavities with a small entrance that protects the colonies from threats. The nests are made up of about , cells when complete and can house 6, to 7, individuals. Pollen, nectar, and honey constitute the diet of these bees. It is also a very social species with eight distinct subspecies. They are found in a wide range of climatic zones ranging from taigas to moist tropical rainforests, steppes, grasslands, deciduous forests, etc. The honey bees are known for their ability to thermoregulate and use it as a mechanism of defense.

*Apis dorsata* The giant honey bee *Apis dorsata* is found primarily in the forested areas of South and Southeast Asia with significant populations in India, Nepal, Malaysia, and Singapore. The bees are about 17 to 20 mm in length. The nests are built in the open at great heights like cliff overhangs, tall buildings or tall trees in dense forests. These bees are known for their vicious behavior and aggressive nature. Their hives are an important source of beeswax and honey which has been harvested for centuries by the indigenous people of the region inhabited by the bees. The giant honey bees build a single vertical comb that is covered by several layers of a dense mass of bees. The conical shaped combs have hexagonal cells and are about 1 meter in width. More than colonies of , bees in each colony might build nests close to each other, exhibiting high levels of social tolerance for each other. Humans have a long relationship with the giant honey bees. Paleolithic-era cave paintings of these bees have been found in Valencia, Spain. However, human-induced activities like use of pesticides, urbanization, honey hunting, and deforestation threaten the bee populations in a significant manner. The bees are known to deliver extremely painful stings and one known case of a fatal defensive attack on a human also exists.

*Apis florea* The red dwarf honey bee

*Apis florea* is a small honey bee species found in parts of southern and southeastern Asia, as well as Africa. The bees build open nests and form small colonies which makes them more susceptible to predators. The bees dance to reach a decision to build a new nesting site. The decision is taken when the majority of the individuals dance in the direction of the proposed new site. An auditory signal of piping is used by the worker bees to inform the swarm that the decision has been taken and then the entire swarm moves off in the new direction. The bees build a single comb nest on a single branch and might salvage the wax from the previous nest if it is close to the new one. The bees feed on honey, nectar, and also pollen. Foraging signals are also communicated via dancing displays. Unfortunately, the red dwarf honey bees are extensively hunted for their honey. The bees also have an important place in Hindu and Buddhist culture. Increased deforestation in many areas has forced the bees to restrict their range and occupy areas that are less populated. *Apis andreniformis* The black dwarf honey bee *Apis andreniformis* lives in the tropical and subtropical areas of southeast Asia. It is a relatively rare species and has been recently classified as a separate species. They are the darkest of the *Apis* genus, and the queens are almost entirely dark. The worker bees have lighter and almost yellow scutellums. The nests are single-combed and hang from small twigs of forest trees at an average altitude of about 2. The honeycombs are about 70 to 90 mm in size. Honey storage is found in the area surrounding the branch and below it lies the brood area where the honey bee larvae develop. The black dwarf honey bee is generally a lowland species and might migrate to higher lands during the rainy season. The species is utilized by humans to prepare some commercial products like honey, wax, royal jelly, and bee venoms. They are important pollinating agents in their region of occurrence. This page was last updated on July 5, By Oishimaya Sen Nag.

### 4: Worldwide importance of honey bees for natural habitats captured in new report

*The Bee Place An Apiary with a Vision. We're committed to ensuring the honey bee's future in all of our communities! The decline of the honey bee population in recent times has been a subject of serious discussion around the world for the last several years.*

Next Lalibela packs a mighty punch. But what is it with this country and fricken bees? Lalibela later had visions of Jerusalem, which sparked his quest to construct a New Jerusalem that would be easier for pilgrims to visit. Carved directly out of the ground beneath, these freestanding monoliths are unlike anything else in the world and are a testament to the faith of those who built it. Lalibela is really one big dirt road across two mountain ridges. There is very little in the way of construction or infrastructure, save for several large and luxurious hotels for foreigners. Translated the Church of St. George, this 13th century monolith is perhaps the poster child for Ethiopia as a tourist destination, and rightfully so. Bet Giyorgis from a higher vantage point. It was only quiet because it was lunch time. The priest inside Bet Giyorgis. He was pretty chilled, and probably a bit over being inundated with tourists day in day out. You can wander for hours and not come across the same church twice, and you actually do need to take care to remember which tunnels you came through in order to get out! I should also add that the churches are in heavy use. People chant, play drums and share injera after a service at Bet Abba Libanos. Is living history an OK term? Everything is just so old! However even if they were built today, the churches would be marvels in their own right. Bet Medhane Alem House of the Saviour of the World is the first church after entering the main complex. When I walked down the stairs remember, everything here is technically underground, a frail, elderly woman asked me to help her down too. After thanking me profusely, she began bowing, kissing the floor and walls, and praying, like clockwork. And she was just one of hundreds. Inside Bet Medhane Alem, there are columns everywhere, owing to its size and shape. Oh, and the odd fluoro tube too. A worshiper in prayer inside Bet Medhane Alem. She prayed for me earlier when I helped her down the steep stairs. It also seems to be a favourite spot for reading the Bible, probably thanks to the fact it gets a fair amount of sunlight unlike many of the other churches. This is where the first complex becomes a choose-your-own-adventure experience. Churches branch out from different sides, and trenches and tunnels lead in different directions. The trenches in particular are a great reminder of just how deep these churches are. Pilgrims set up camp in holes in the walls of the church complexes. One of the churches, Bet Golgotha no prizes this time, either has fantastic, life-size niches of the 12 Apostles, however only four are visible as the remainder are off-limits to tourists. The four that I was allowed to see are actually also off-limits to women, like many of the churches I visited in Ethiopia. A couple of women got a nasty surprise when the priest shrieked at them for accidentally entering. In between the two complexes and Bet Giyorgis are heaps and heaps of tukuls, which are the local style of hut. Some were still occupied, while others were shops. Bet Golgotha and Bet Mikael. Bet Maryam as seen from ground level. This priest was eager so show off his robes and church treasures. The intricate interior of Bet Maryam. Upon entering the second complex I interrupted the end of a church service at Bet Abba Libanos. This was the first of many, but it was amazing to be present for the chanting and drumming. Afterwards, service attendees shared injera amongst each other. The end of a church service at Bet Abba Libanos, taken from the roof. People are seen leaving the complex to eat together outside. Its stripy architecture replicates the wooden Axumite architecture that preceded it, such as that at Yemrehanna Kristos read on and Debre Damo. Bet Amanuel, with its Axumite-inspired architecture. Despite the horizontal layers, the building is still just one single piece of rock. Bet Gabriel-Rufael is another pair of churches in the complex which looks spectacular, but unfortunately it was off limits to tourists because of ongoing restoration financed by the American embassy. This complex is even more extensive and multi-layered than the first, with staircases leading in every direction and tunnels so long they are pitch black. A passageway near Bet Maryam. Steps near Bet Abba Libanos. A very high tunnel near Bet Abba Libanos. A passageway near Bet Abba Libanos. Back to the town itself: These are best experienced from the Ben Ababa restaurant at the far end of the mountain ridge. The food both Ethiopian and western is forgettable, but what makes it worth visiting are the mushroom-esque platforms which provide an

unobstructed view of mountains and valleys as far as the eye can see. The view from Ben Abeba never got old. Speaking of food, the tej is great in Lalibela. The tej I had in Lalibela was some of the best I had in the country. I happened to have it at an azmari bet, a traditional type of Ethiopian venue where a performer called an azmari basically plays a kirar similar to a lyre and roasts everyone in the audience one by one. Everyone in an azmari bet is also expected to dance apparently. When the azmari came over to my table, with me and some other faranjis I had met, we were thrust into the spotlight. When I got up to dance with one of the hosts, the whole room gave the biggest cheer of the night. It essentially involves dancing one-on-one while gyrating your shoulders several times per second to the rhythm of the music. Obviously I was pretty shit at it, but everyone seemed to appreciate my effort and energy—so much so that for the rest of the night, women and men, young and old, kept pulling me up to dance with me. Anyway, back to the tej. I tried three brews: I headed to the town of Bilbila, and saw two really worthwhile churches. Yemrehanna Kristos is one of a select-few remaining buildings to be from the Axumite era. To get there, you have to climb up a staircase that leads halfway up the hill. The church itself is beautiful. Unsurprisingly, it was built by Negus and also Saint, again Yemrehana Krestos, and locals told me that Negus Gebre Mesqel Lalibela was keen to compete for a larger legacy, hence the churches in Lalibela proper. I was also told the olive wood and gypsum that the church is made of was transported from Jerusalem and Egypt by angels, allowing the church to be built in a relatively short period of time. The floor of the entire cave, however, is made of locally-sourced pine wood. Underneath are puddles and mash, the water from which is considered holy and as such has curative properties. Inside, the intricate woodwork continues, and there also some exceptional paintings on the walls, pillars and ceilings. At the back of the cave are the mummified remains of thousands of pilgrims, some who have come from as far as Jerusalem itself. Geometric church paintings inside Yemrehanna Kristos. Faded church paintings inside Yemrehanna Kristos. Mummified pilgrims at Yemrehanna Kristos. The two buildings of Yemrehanna Kristos. The final church I visited, Bilbila Giyorgis, is where I had the best honey in the world. Babila Giyorgis is said to date from the 5th century, and compared to the other churches, you can definitely tell. The priest explained that the present colonies have continued on from that time. The honey itself is collected once a year, and I was lucky to be allowed to try a bit of what still remained from last year. Not that it mattered, as I was happy to surrender my sense of sight to my sense of taste. Think of it as synaesthesia. As with anything church-related, the honey is also considered to be holy and is claimed to have curative properties for skin, abdominal and mental conditions. Bilbila Giyorgis and its wooden scaffolding. One of the few paintings inside the relatively spartan Bilbila Giyorgis. The painting depicts St. One of the many colonies in the church. I was only allowed to try the honey once I had walked sufficiently far enough away from the church, and I can confidently report back that holy is an understatement. Not only does it look opaque, but its texture is almost gritty. The flavour really makes you question why we refine our honey so much back at home. Negus Gebre Mesqel Lalibela would be proud, and so he should be. Not that he had anything to do with the honey which predates his reign by a few centuries, but you get the idea. Lalibela is the main tourist destination in Ethiopia, and everywhere you go you can tell.

### 5: Lalibela, bees and the best honey in the world – New Faces, New Places

*Honey bees are native to Africa, the Middle East and Southern Europe and have become naturalized in ecosystems around the world as a result of intentional transport by humans.*

Honey bee deaths have been occurring in vast numbers in recent years. Why are honey bees dying at such an alarming rate? And what would the disappearance of honey bees mean to the world? Why Are Honey Bees Dying? As people learn about the honey bee deaths that have been occurring at such a tragic rate, the first and most obvious question asked is "why? Lots of different problems have come together within a short span of time, pummeling the bee population with unprecedented ferocity. How Bad Is It? And that only tells part of the story. Wild Bee Colonies Are Almost Gone Feral, or wild honey bee colonies, have been present throughout the United States since bees were introduced to the Americas hundreds of years ago. Feral colonies have become quite rare due to all the problems bees have been facing. In fact, in some parts of the country, wild honey bee colonies have all but been wiped out. That means that in many areas, if there are no beekeepers, there are no bees. But this much is for certain: Even assuming that other pollinating species were undamaged by some of the same problems facing honey bees. And unfortunately, that is NOT a valid assumption! Could Honey Bees Disappear Completely? Is the problem really so bad that honey bees might disappear altogether? This Cloud Has a Silver Lining Though the rates of honey bee deaths that have been occurring in recent years is both tragic and frightening, there is a silver lining to this very dark cloud. And so are many others. Many people have become interested in honey bees as a result of this crisis. In the long run, that will be a good thing. The increased attention to honey bees, and widespread concerns about their well-being have resulted in many positives: Many cities, like New York, have dropped asinine laws against beekeeping within city limits unfortunately, many of these asinine laws are still in place in other cities. More people have become educated about how valuable honey bees are to nature and to us. More people have become interested in supporting local beekeepers – and therefore, the local honey bee population – by purchasing local honey. Some of the problems are relatively new, and some have been around for a while. Use your cell phone with a clear conscience! These are the REAL problems that bees are facing!

### 6: Honey bee videos, photos and facts - Apis mellifera | Arkive

*Bees of various types other than honey bees are also domesticated and used for pollination or other means around the world, including *Tetragonula iridipennis* in India, the blue orchard bee for tree nut and fruit pollination in the United States, and a number of species of *Bombus* (bumblebees) for pollination in various regions globally, such as tomatoes, which are not effectively pollinated by honey bees.*

The genus *Apis* is distinctive for its fascinating biology, ecologic preeminence, and pervasive importance to agriculture. Its natural range extends from Portugal to Japan, from the cape of South Africa to near the Arctic circle, and in that vast range are at least five member species. But we must limit our attention to just one. Honey bee queens are usually categorized by their race or some other description of their breeding. The VSH line, pictured here, is actually a mix of different races of bees found in Louisiana and Michigan with mite resistant traits. Photo courtesy of Glenn Apiaries. For starters, that one species, *Apis mellifera*, is further subdivided into at least 20 recognized subspecies, races, or locally-derived biotypes ranging naturally from northern Europe, the Middle East, and all of Africa. None is native to North America but was introduced to that continent, most significantly during the centuries of European colonization. I will limit my discussion to those races of enduring historic or practical interest to North American beekeeping. *Apis mellifera mellifera* Called variably the German black bee or north European bee, this race is thought to be the first to make landfall in North America, most likely in the year on the coast of Virginia. Encountering flora and temperatures similar to back home, the German black bee flourished along the east coast, so much so that by the end of the next century naturalists were debating whether in fact A. Practically speaking, the German black bee was the only honey bee in eastern North America until the mid century when improved steam technology made possible rapid ship transit across the Atlantic. This development heralded a wave of diverse and unregulated honey bee imports to a degree never seen before or since. The German black bee, in spite of its suitability for northern latitudes, never really won the hearts of American beekeepers. It tended to sting a lot and was prone to serious diseases like American foulbrood. In speaking about the German black bee I tend to speak in past tense because it is doubtful whether A. Although its genetic ghosts remain in the melting pot that has become North America. *Apis mellifera ligustica* Cordovan queen: Cordovan bees are Italian *Apis mellifera ligustica* bees that have been selected for the single recessive gene that determines the cordovan color. For decades, bee researchers have utilized this cordovan color variation in ingenious experiments to decipher the genetics, mating behavior and other aspects of the honeybee. Like cream rising to the top, its numerous assets became apparent during the Great Importations of the 19th century and before long it predominated over other imports and became the standard against which others are judged. This preeminence is justified. The Italian bee is relatively gentle, and it is not far-fetched to say that the Italian bee is the most productive honey bee on Earth with colony populations and honey yields regularly exceeding comparison groups. Its body color tends toward lighter golds and browns. I once had the opportunity to observe an apiary of imported Italian bees in the country of Azerbaijan near the Caucasus Mountains, native range of the Caucasian honey bee. It was not a scientific observation, as the sample size was one and I cannot exclude the possibility that this beekeeper was unusually skilled and progressive. But after days of observing apiaries of lackluster native bees I was astonished at this Italian apiary in which bees were foraging like crazy and colonies at least twice as populous as their neighbors. I must hasten to add that Italian bees are not perfect from a beekeeping point of view. Their rapid spring buildup and productivity come at the cost of what is best described as reckless spending. Italians initiate early and expansive brood production at levels far in excess of the food stores they possess to support this activity. Unless the beekeeper intervenes, the outcome can be colony death from starvation. Another problem with Italians, most apparent since the parasite introductions of the s, is a general susceptibility to pests and diseases. *Apis mellifera caucasica* This subspecies is native to the trans-Caucasus region between the Black and Caspian Seas and was imported to North America beginning around It is best known as a gentle bee, and for this reason was a favorite of beginners in the United States for a long time. I remember advertisements for this bee in the beekeeping magazines as late as the s. But

Caucasian bees have fallen out of favor, and there are few if any providers of this stock remaining in North America. For one thing they are not as productive as Italians, and they have a propensity to heavily coat the interiors of their hives with propolis – a natural glue derived from tree resins. North American beekeepers have an historic intolerance of propolis, but I have come to think this is a misguided prejudice. There is evidence to suggest that propolis possesses anti-microbial properties and aids bees in defense against nest invaders, traits increasingly important in this age of exotic pests and chemical-based pest control. There may come a day when Caucasians, or at least their propolis habits, are looked on favorably again. *Apis mellifera carnica* Carniolan queens are known for their dark color, winter hardiness, and rapid spring buildup. In contrast to the Caucasian, the Carniolan bee has enjoyed a rise in popularity in recent years. *Apis mellifera carnica* is native to east-central Europe. It is the darkest of the popular races, and for this reason one sometimes has trouble finding Carniolan queens while working a hive because they blend so completely into the background of black bees surrounding them. Carniolans are thought to express a measure of resistance to the parasitic varroa mite. But perhaps their most consistent feature is the conservative way in which they spend their food resources and expand their brood nest in spring. In this regard one might think of them as the antithesis to Italian bees.

Russian bees In the s the US Department of Agriculture began a cooperative project with researchers in eastern Russia to locate, test, and import honey bees from that area into the United States. The motivation behind this was the varroa mite crisis in the US and the search for bees that would have genetic resistance to this pest. The USDA researchers reasoned that genetic resistance was most likely to be found in that area of the world where the ranges of *Apis mellifera* and varroa mites had overlapped for the longest period of time, thus providing a chance for natural selection to confer resistance to the bees. In eastern Russia there was a long-established population of honey bees originally imported by rail from European Russia in the early 20th century. It is assumed the original bees were predominately Carniolan. Subsequent studies revealed that the east Russian bees are indeed resistant to varroa mites, and ultimately the bees were introduced into the United States where today they comprise a growing fraction of the commercial bee stocks. The bees display a measurable degree of varroa mite resistance while maintaining levels of productivity comparable to Italians. The Russian bees also exhibit the Carniolan feature of conservative spring buildup. During the centuries of European New World colonization, as in North America there were repeated introductions of European bees into the southern continent. However, European bees transported into tropical regions of South America did not flourish and by the mid 20th century beekeeping in Brazil and other South American countries was considered below world standards. The solution, it was believed, was to import honey bees from tropical Africa, and this objective was accomplished in the late s. The new bees were indeed splendidly suited to the conditions they encountered in Brazil and soon began a rapid territorial expansion, eventually reaching the southern US by For most of their history in the US, Africanized bees restricted their range to the American Southwest; however this changed in when reproducing populations of Africanized bees were confirmed in Florida. The extent of their eventual range in North America is uncertain, but there is evidence that they are limited by temperate latitudes. Africanized queen Photo courtesy of Glenn Apiaries Africanized bees are more aggressive than European bees, as seen in this photo where bees are stinging a piece of leather material being waved over an open Africanized colony. Photo courtesy of Glenn Apiaries During their year history in the New World the Africanized bees have established a reputation as extremely defensive insects. There have been thousands of mass stinging incidents with these bees, some lethal, involving humans and animals. Back to table of contents for First Lessons in Beekeeping: Honey Bee Biology Source:

## 7: Beekeeping - Wikipedia

*Yes Acacia honey is one of the best in the world, from various parts of Europe and Eastern Europe. The reason for this is its unadulterated flavour of pure honey. Other honeys have very specific dominating flavours like citrus or clover etc wherever the bees collect, making the honey taste overwhelmingly in this case like citrus for example.*

The worker bees rotate through the cluster from the outside to the inside so that no bee gets too cold. The colder the weather is outside, the more compact the cluster becomes. During winter, they consume their stored honey to produce body heat. During the summer, however, this is achieved through fanning and water evaporation from water collected in various fields. Pollination management and List of crop plants pollinated by bees Of all the honey bee species, only *A. mellifera*. Without specialized adaptations for specific flowers, their ability to reach pollen and nectar is often limited. As such, they can provide some pollination to many plants, especially non-native crops, but most native plants have some native pollinator that is far more effective at pollinating that species. Plantains are sterile and propagated by cuttings, as are cassava. Potatoes, yams, and sweet potatoes are root vegetables propagated by tubers. Rice, wheat, and corn are all wind-pollinated, because this is true of all grasses. Similarly, no crops originating in the New World depend on the domesticated honey bee *Apis mellifera* at all, as the insect is invasive, having been brought over with colonists in the last few centuries. Thomas Jefferson mentioned this in his Notes on the State of Virginia: Marcgrave indeed mentions a species of honey-bee in Brasil. But this has no sting, and is therefore different from the one we have, which resembles perfectly that of Europe. The Indians concur with us in the tradition that it was brought from Europe; but, when, and by whom, we know not. The bees have generally extended themselves into the country, a little in advance of the white settlers. The stingless bees mentioned by Jefferson are distant relatives of the honey bees, in the genus *Melipona*. Nutrition[ edit ] Honey bees obtain all of their nutritional requirements from a diverse combination of pollen and nectar. Pollen is the only natural protein source for honey bees. Adult worker honey bees consume 3. Of these amino acids, honey bees require highest concentrations of leucine, isoleucine, and valine, however elevated concentrations of arginine and lysine are required for brood rearing. Pyridoxine is the most prevalent B vitamin found in royal jelly and concentrations vary throughout the foraging season with lowest concentrations found in May and highest concentrations found in July and August. Honey bees lacking dietary pyridoxine were unable to rear brood. Fat-soluble vitamins A, D, E, and K are not considered essential but have shown to significantly improve the number of brood reared. Nurse bees have the ability to selectively transfer sterols to larvae through brood food. The dominant monosaccharides in honey bee diets are fructose and glucose but the most common circulating sugar in hemolymph is trehalose which is a disaccharide consisting of two glucose molecules. Occasionally on hot days or when nectar is limited, foragers will collect water from streams or ponds to meet the needs of the hive. Eggs are laid within the hive, and the larva that hatch tunnel through and destroy the honeycombs that contain bee larva and their honey stores. The tunnels they create are lined with silk, which entangles and starves emerging bees. Destruction of honeycombs also result in honey leaking and being wasted. Chemical fumigants, particularly CO<sub>2</sub>, are also used. Beekeeping The only domesticated species of honey bee are *A. mellifera*. In Japan, where *mellifera* is vulnerable to local hornets and disease, the Japanese honey bee *A. cerana*. Modern hives also enable beekeepers to transport bees, moving from field to field as the crop needs pollinating and allowing the beekeeper to charge for the pollination services they provide, revising the historical role of the self-employed beekeeper, and favoring large-scale commercial operations. Bees of various types other than honey bees are also domesticated and used for pollination or other means around the world, including *Tetragonula iridipennis* in India, the blue orchard bee for tree nut and fruit pollination in the United States, and a number of species of *Bombus* bumblebees for pollination in various regions globally, such as tomatoes, which are not effectively pollinated by honey bees. Colony collapse disorder Primarily in places where the bee was imported by humans, periodic collapses in honeybee populations have occurred at least since the late 19th century. This has been dubbed "colony collapse disorder" CCD and was at first unexplained.

## 8: Habitat of a Honey Bee: Beehives, Climates & Locations of Honeybees

*The Importance of Bees The bees place in our world is important beyond our understanding. The small little insect that works so tirelessly and quietly around us certainly is one of the reasons, if not a main reason, for the possibility of human development on earth.*

Honey barbecue and honey mustard are other common flavors used in sauces. The inset shows a close-up of the honey, showing the individual glucose grains in the fructose mixture. The physical properties of honey vary, depending on water content, the type of flora used to produce it pasturage, temperature, and the proportion of the specific sugars it contains. Fresh honey is a supersaturated liquid, containing more sugar than the water can typically dissolve at ambient temperatures. At room temperature, honey is a supercooled liquid, in which the glucose will precipitate into solid granules. This forms a semisolid solution of precipitated glucose crystals in a solution of fructose and other ingredients. Below this temperature, honey can be either in a metastable state, meaning that it will not crystallize until a seed crystal is added, or, more often, it is in a "labile" state, being saturated with enough sugars to crystallize spontaneously. Honeys that are supersaturated with a very high percentage of glucose, such as brassica honey, crystallize almost immediately after harvesting, while honeys with a low percentage of glucose, such as chestnut or tupelo honey, do not crystallize. Some types of honey may produce very large but few crystals, while others produce many small crystals. Crystal nuclei seeds tend to form more readily if the honey is disturbed, by stirring, shaking, or agitating, rather than if left at rest. Therefore, larger but fewer crystals tend to form at higher temperatures, while smaller but more-numerous crystals usually form at lower temperatures. At very low temperatures, honey does not freeze solid. Instead, as the temperatures become lower, the viscosity of honey increases. Like most viscous liquids, the honey becomes thick and sluggish with decreasing temperature. Below this temperature, honey enters a glassy state and becomes an amorphous solid noncrystalline. The sheet-like appearance of the flow is the result of high viscosity and low surface tension, contributing to the stickiness of honey. The higher the water percentage, the more easily honey flows. Above its melting point, however, water has little effect on viscosity. Aside from water content, the composition of honey also has little effect on viscosity, with the exception of a few types. Viscosity increase due to temperature occurs very slowly at first. Honeys from heather or manuka display thixotropic properties. These types of honey enter a gel-like state when motionless, but then liquify when stirred. Measurements of the electrical conductivity are used to determine the quality of honey in terms of ash content. Variations in the water content alter the refractive index of honey. Water content can easily be measured with a refractometer. Typically, the refractive index for honey ranges from 1. Honey also has an effect on polarized light, in that it rotates the polarization plane. The fructose gives a negative rotation, while the glucose gives a positive one. The overall rotation can be used to measure the ratio of the mixture. The amount of water the honey absorbs is dependent on the relative humidity of the air. Honey tends to absorb more water in this manner than the individual sugars allow on their own, which may be due to other ingredients it contains. On the left is how it appears fresh, but the honey on the right has been aged at room temperature for two years. While still edible, the Maillard reaction produces considerable differences in the color and flavor of the aged honey. Like all sugar compounds, honey caramelizes if heated sufficiently, becoming darker in color, and eventually burns. However, honey contains fructose, which caramelizes at lower temperatures than glucose. Honey also contains acids, which act as catalysts for caramelization. The specific types of acids and their amounts play a primary role in determining the exact temperature. The amino acids form darkened compounds called melanoidins, during a Maillard reaction. The Maillard reaction occurs slowly at room temperature, taking from a few to several months to show visible darkening, but speeds up dramatically with increasing temperatures. However, the reaction can also be slowed by storing the honey at colder temperatures. However, honey takes substantially longer to liquify when just above the melting point than at elevated temperatures. However, many of the minor substances in honey can be affected greatly by heating, changing the flavor, aroma, or other properties, so heating is usually done at the lowest temperature possible for the shortest amount of time. However, the

different types and their amounts vary considerably, depending on the type of honey. These acids may be aromatic or aliphatic nonaromatic. The aliphatic acids contribute greatly to the flavor of honey by interacting with the flavors of other ingredients. Please help improve this article by adding citations to reliable sources. Unsourced material may be challenged and removed. August Learn how and when to remove this template message Honey is classified by its floral source, and divisions are made according to the packaging and processing used. Also, regional honeys are identified. In the USA, honey is also graded on its color and optical density by USDA standards, graded on the Pfund scale, which ranges from 0 for "water white" honey to more than for "dark amber" honey. Honeys can be from specific types of flower nectars or can be blended after collection. The pollen in honey is traceable to floral source and therefore region of origin. The rheological and melissopalynological properties of honey can be used to identify the major plant nectar source used in its production. Different monofloral honeys have a distinctive flavor and color because of differences between their principal nectar sources. In practice, because of the difficulties in containing bees, a small proportion of any honey will be from additional nectar from other flower types. Some typical European examples include thyme , thistle , heather , acacia , dandelion , sunflower , lavender , honeysuckle , and varieties from lime and chestnut trees. Egypt , examples include clover, cotton , and citrus mainly orange blossoms. Honeydew honey[ edit ] Instead of taking nectar, bees can take honeydew , the sweet secretions of aphids or other plant sap-sucking insects. Honeydew honey is very dark brown in color, with a rich fragrance of stewed fruit or fig jam, and is not as sweet as nectar honeys. This honey has a much larger proportion of indigestibles than light floral honeys, thus causing dysentery to the bees, [75] resulting in the death of colonies in areas with cold winters. Good beekeeping management requires the removal of honeydew prior to winter in colder areas. Bees collecting this resource also have to be fed protein supplements, as honeydew lacks the protein-rich pollen accompaniment gathered from flowers. Classification by packaging and processing[ edit ] Generally, honey is bottled in its familiar liquid form. However, honey is sold in other forms, and can be subjected to a variety of processing methods. A honeycomb A variety of honey flavors and container sizes and styles from the Texas State Fair Crystallized honey occurs when some of the glucose content has spontaneously crystallized from solution as the monohydrate. It is also called "granulated honey" or "candied honey". Honey that has crystallized or commercially purchased crystallized can be returned to a liquid state by warming. Pasteurization destroys yeast cells. It also liquefies any microcrystals in the honey, which delays the onset of visible crystallization. However, excessive heat exposure also results in product deterioration, as it increases the level of hydroxymethylfurfural HMF [ citation needed ] and reduces enzyme e. Heat also affects appearance darkens the natural honey color , taste, and fragrance. Strained honey has been passed through a mesh material to remove particulate material [79] pieces of wax, propolis , other defects without removing pollen, minerals, or enzymes. Filtered honey of any type has been filtered to the extent that all or most of the fine particles, pollen grains, air bubbles, or other materials normally found in suspension, have been removed. When honey is exposed to ultrasonication, most of the yeast cells are destroyed. Those cells that survive sonication generally lose their ability to grow, which reduces the rate of honey fermentation substantially. Ultrasonication also eliminates existing crystals and inhibits further crystallization in honey. Creamed honey contains a large number of small crystals, which prevent the formation of larger crystals that can occur in unprocessed honey. The processing also produces a honey with a smooth, spreadable consistency. This process may or may not include the use of drying and anticaking agents. It is traditionally collected using standard wooden frames in honey supers. The frames are collected and the comb is cut out in chunks before packaging. As an alternative to this labor-intensive method, plastic rings or cartridges can be used that do not require manual cutting of the comb, and speed packaging. Comb honey harvested in the traditional manner is also referred to as "cut-comb honey". Other ingredients may then be added. For example, abbamele has added citrus. The resulting product may be similar to molasses. It is generally used as an ingredient in food processing. Food grading In the US, honey grading is performed voluntarily USDA does offer inspection and grading "as on-line in-plant or lot inspection Honey is graded based upon a number of factors, including water content, flavor and aroma, absence of defects, and clarity. Honey is also classified by color, though it is not a factor in the grading scale.

### 9: Bees-and-Beekeeping: Honey Bee Deaths - Why Are Bees Dying?

*From there, the honey bee migrated to Europe and was later introduced to America by pilgrims, who brought them over to produce honey. As a result, Africa has the oldest colonies of bees in the world. African bees also tend to form smaller colonies and spread out faster, nesting in tree branches and other open spaces.*

Honey seeker depicted on 8,000-year-old cave painting near Valencia, Spain [1] Depictions of humans collecting honey from wild bees date to 10,000 years ago. At some point humans began to attempt to domesticate wild bees in artificial hives made from hollow logs, wooden boxes, pottery vessels, and woven straw baskets or "skeps". 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: Beekeeping was considered a highly valued industry controlled by beekeeping overseers" owners of gold rings depicting apiculture scenes rather than religious ones as they have been reinterpreted recently, contra Sir Arthur Evans. The hives were found in orderly rows, three high, in a manner that could have accommodated around hives, held more than 1 million bees and had a potential annual yield of 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. 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. 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 beekeeping still occurs around the world today. Many others rear their young in burrows and small colonies e. Some honey bees are wild e. Beekeeping, or apiculture, is concerned with the practical management of the social species of honey bees, which live in large colonies of up to , individuals. In Europe and America the species universally managed by beekeepers is the Western honey bee *Apis mellifera*. This species has several sub-species or regional varieties, such as the Italian bee *Apis mellifera ligustica* , European dark bee *Apis mellifera mellifera* , and the Carniolan honey bee *Apis mellifera carnica*. In the tropics, other species of social bees are managed for honey production, including the Asiatic honey bee *Apis cerana*. In Africa, honeyguide birds have evolved a mutualist relationship with humans, leading them to hives and participating in the feast. This suggests honey harvesting by humans may be of great antiquity. Some of the earliest evidence of gathering honey from wild colonies is from rock paintings , dating to around Upper Paleolithic 13,000 BCE. Gathering honey from wild bee colonies is usually done by subduing the bees with smoke and breaking open the tree or rocks where the colony is located, often resulting in the physical destruction of the nest. Study of honey bees[ edit ] It was not until the 18th century that European natural philosophers undertook the scientific study of bee colonies and began to understand the complex and hidden world of bee biology. He observed queens laying eggs in open cells, but still had no idea of how a queen was fertilized; nobody had ever witnessed the mating of a queen and drone and many theories held that queens were "self-fertile ," while others believed that a vapor or "miasma" emanating from the drones fertilized queens without direct physical contact. Huber was the first to prove by observation and experiment that queens are physically inseminated by drones outside the confines of hives, usually a great distance away. This allowed inspecting individual wax combs and greatly improved direct observation of hive activity. Huber confirmed that a hive consists of one queen who is the mother of all the female workers and male drones in the colony. He was also the first to confirm that mating with drones takes place outside of hives and that queens are inseminated by a number of successive matings with male drones, high in the air at a great distance from their hive. Together, he and Burnens dissected bees under the microscope and were among the first to describe the ovaries and spermatheca , or sperm store, of queens as well as the penis of male drones. Huber is universally regarded as "the father of modern bee-science" and his "Nouvelles Observations sur Les Abeilles or "New Observations on Bees" [18] revealed all the basic scientific truths for the biology and ecology of honeybees. Invention of the

movable comb hive[ edit ] Rural beekeeping in the 16th century Early forms of honey collecting entailed the destruction of the entire colony when the honey was harvested. 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. Wildman also described [21] a further development, using hives with "sliding frames" for the bees to build their comb, foreshadowing more modern uses of movable-comb hives. The oldest testimony on their use dates back to although it is probable that their use is more than years old. 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. 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 see also Beekeeping in 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 s 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. Honey-laden honeycomb in a wooden frame The differences in hive dimensions are insignificant in comparison to the common factors in all these hives: 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. Pioneers of practical and commercial beekeeping[ edit ] The 19th century produced an explosion of innovators and inventors who perfected the design and production of beehives, systems of management and husbandry, stock improvement by selective breeding , honey extraction and marketing. Preeminent among these innovators were: Petro Prokopovych , used frames with channels in the side of the woodwork; these were packed side by side in boxes that were stacked one on top of the other. The bees traveled from frame to frame and box to box via the channels. The channels were similar to the cut outs in the sides of modern wooden sections [23] All modern beehives are descendants of his design. Langstroth , revered as the "father of American apiculture"; no other individual has influenced modern beekeeping practice more than Lorenzo Lorraine Langstroth. His classic book *The Hive and Honey-bee* was published in He invented the Bee smoker in Root pioneered the manufacture of hives and the distribution of bee-packages in the United States. Miller was one of the first entrepreneurs to actually make a living from apiculture. By he made beekeeping his sole business activity. His book, *Fifty Years Among the Bees*, remains a classic and his influence on bee management persists to this day. Honey spinner Franz Hruschka was an Italian military officer who made one crucial invention that catalyzed the commercial honey industry. In he invented a simple machine for extracting honey from the comb by means of centrifugal force. His original idea was simply to support combs in a metal framework and then spin them around within a container to collect honey as it was thrown out by centrifugal force. This meant that

honeycombs could be returned to a hive undamaged but empty, saving the bees a vast amount of work, time, and materials. This single invention greatly improved the efficiency of honey harvesting and catalysed the modern honey industry. Kelley was an American pioneer of modern beekeeping in the early and mid-th century. He greatly improved upon beekeeping equipment and clothing and went on to manufacture these items as well as other equipment. Manley, author of many titles, including *Honey Production in the British Isles* and inventor of the Manley frame, still universally popular in the U. Ahmed Zaky Abushady, was an Egyptian poet, medical doctor, bacteriologist and bee scientist who was active in England and in Egypt in the early part of the twentieth century. In 1907, Abushady patented a removable, standardized aluminum honeycomb. Betts and later by Dr. Its archives are held in the National Library of Wales. Mattoo was the pioneer worker in starting beekeeping with Indian honeybee, *Apis cerana indica* in early s. Beekeeping with European honeybee, *Apis mellifera* was started by Dr. Atwal and his team members, O. Goyal in Punjab in early s. It remained confined to Punjab and Himachal Pradesh up to late s. Later on in 1950, Dr. Sihag, working at Haryana Agricultural University, Hisar Haryana, introduced and established this honeybee in Haryana and standardized its management practices for semi-arid-subtropical climates. On the basis of these practices, beekeeping with this honeybee could be extended to the rest of the country. Now beekeeping with *Apis mellifera* predominates in India.

Soldiers and settlers Appreciating the difference University of Illinois Pork Industry Conference Expert testimony on risk and future dangerousness Daniel Krauss and Joe Lieberman Premier designs jewelry catalog 2011 Experiences. Second, the technique provides a fertile source of hypotheses Happy Valentines Day, little critter! The Boy Allies on the Firing Line or Twelve Days Battle Along the Marne Forever jack natasha boyd Per state to facilitate the separation of state and local influences. The Palynological correlation of major Pennsylvanian (Middle and Upper Carboniferous chronostratigraphic boun Films Of Makhmalbaf Agricultural finance in India Class in the new world and the new economy Landscapes in music Truth Applied (Ministry Monographs for Modern Times) Common Channel Signaling Polish communismin crisis Agricultural Economics (Cram101 Textbook Outlines Textbook NOT Included) Vivian of Cavendish Square Television plays, 1965-1984 Jupiter, the largest planet Detailed Diagnoses and Surgical Procedures for Patients Discharged from Short-Stay Hospitals, United Stat Dsc 1616 user manual Harbors and high seas The Rhine, including the Black Forest the Vosges Game of throne piano sheet music Ebook harry potter series Link in a ument U2013 The Kitchen in the Home Hypnosis and the unity of consciousness Tim Bayne VI. The sea-mans return, from Deut. 33. 19. Accidentally in love nikita singh Uncanny returns: representations of trauma in Alicia Kozamehs Pasos bajo el agua Parent-teacher conferences Aischylou Eumenides = Social Inequalities and Cancer (DISCONTINUED (IARC Scient Pub)) Deterioration, maintenance, and repair of structures Teach Yourself Living Mandarin Lord of High Cliff Manor