



Preface

MAN SHALL NOT LIVE BY BREAD ALONE

*“A bee colony is like a magic well;
the more you draw from it the richer it flows.”*

KARL VON FRISCH

UNTIL RECENTLY, THE May 24, 2012, article in the *Neue Zürcher Zeitung* would not have been considered front-page news for this well-respected Swiss newspaper: “Bee Smuggling Exposed: 80 Illegally Imported Bee Colonies Destroyed.” A German man aged almost thirty was arrested by customs investigators as he attempted to sell artificial swarms—bees taken by the kilo from other colonies with a separately packed queen—that had not been declared and were thus illegal. Among the twenty Swiss beekeepers he had contacted online and lured to the border was an undercover buyer from the Verein deutschschweizerischer Bienenfreunde (the society of German and Swiss bee friends). He revealed his true intentions just as the money was being exchanged for bees. All of a sudden it wasn’t bees that were swarming but customs officials. This single operation brought the Zurich customs investigators eighty Swiss buyers whose illegally imported colonies were immediately and completely destroyed. Many more buyers remained at large.

Why were the colonies destroyed? Why so much fuss about a mere 135 Swiss francs (slightly more than US\$150) per colony? For once, the customs investigators were not interested in money, their motive was the survival of the Swiss bee world. Illegally imported colonies could be disease carriers, worsening the rates of bee mortality there. In some regions of Switzerland, up

to 70 percent of colonies didn't survive the winter of 2011/2012. In Germany, according to expert estimates, up to one-third of the colonies—about 300,000 from a total of roughly 1 million—didn't survive the winter.¹ And in the USA, on average, one-third of all bee colonies have been dying annually since 2006. At the fifth EurBee Congress, an international conference of apidology, in Halle, Germany, at the beginning of September 2012, Professor Robin Moritz warned about the worldwide collapse of bee populations in his opening address.

If 70 percent of all cattle or 30 percent of all chickens were to die annually, states of emergency would be declared everywhere. The death of bees is at least that dramatic and with even more far-reaching consequences. The bee is our smallest working animal. In the peak year of 2007, they gave us a record yield worldwide of 1.4 million metric tons (slightly more than 1.5 million short tons) of honey. But the questions arising from the consequences of these deaths are about more than just honey.

Successful pollination is a prerequisite for fruit production. Bees pollinate more than 70 percent of the one hundred most important domesticated plant species in the world. A colony of honeybees can visit up to 7 million blossoms every day. It is hard to imagine what a loss of bee power would mean. What if the honeybees, whose services humans have taken advantage of for years, no longer performed their services? Bees are responsible for 30 percent of global harvests, and if they fail, we have to do without every third bite. It is about nothing less than global food supplies. Our plates would look dreary were it not for the bees' contribution. Many of the things that are colorful, aromatic, and tempting would be missing. Apples, cherries, asparagus, soya beans, peaches, and cucumbers, for example, are only a few of almost one hundred kinds of fruit and vegetables that are dependent on pollination by bees. A hamburger would have no salad, no onion, no ketchup; the meat would come from a cow that had never eaten clover. Only the bread roll would be unaffected as wheat is pollinated by the wind.

In the quest to explain why honeybees are leaving us by the billions, we find not a reason but rather reasons: diseases, including epidemics; agricultural toxins; depletion of blossoms leading to starvation for bees; changes in

climate conditions; and a weakening of the natural resistance of bees. The majority of experts believe that it is the sum of many different, intensifying attacks on bees' immune systems that is now causing catastrophic gaps in the global bee population.

Many experts and apiarists place the blame primarily on pesticides. Scientists have been able to prove that in 2008 in the Rhine Valley, more than eleven thousand bee colonies were either killed or severely damaged by a nicotine-like neurotoxin used when sowing corn.

On March 10, 2011, the United Nations (UN) issued a statement in response to the crisis: "Systemic insecticides such as those used as seed coatings, which migrate from the roots through the entire plant all the way to the flowers, can potentially cause toxic chronic exposure to non-target pollinators. [...] Laboratory studies have shown that such chemicals can cause losses of sense of direction, impair memory and brain metabolism, and cause mortality."²

The UN has stated in at least one of its World Food Reports that the world's population can only be supported by small, structured farming. However, in reality the opposite continues to be the case because monocultures are more efficient to farm. Just as totalitarian systems can only survive with a brutal police force, monocultures rely on policing by pesticides that keep in check pests that would otherwise find their ideal living conditions there. Toxins in foodstuffs and the loss of bees are the collateral damage. Intensive farming methods for agricultural rationalization and improved efficiency are justified by the claim that there is no other way of guaranteeing global nourishment. "Humans have the illusion that in the twenty-first century they can be independent of nature with the aid of technological progress," said Achim Steiner, director of the UN Environment Programme.³ This raises a loaded question: Do we want to starve healthily or to eat but be poisoned in the process?

However, some experts from other renowned bee institutes don't blame agrochemicals for the decline in bees. Dr. Peter Rosenkranz, from the Landesanstalt für Bienenkunde of Hohenheim University, is one of them: "The most important factor is *Varroa destructor*, followed by *Varroa destructor* and then *Varroa destructor*."⁴

Varroa destructor, or the *varroa* mite, was introduced from China and has unequivocally been causing honeybees problems since the end of the 1970s. These mites infest the broods and live off the blood of bees. Additionally, viruses that deform the wings infiltrate the open wounds at the point of contact of the bites. In human terms, this mite would correspond to a leech the size of a rabbit. The immense deficiencies within populations lead to labor shortages and thus to a lack of care for the broods and insufficient food reserves. The colony becomes weak and eventually collapses. Does this collapse mean the end of the mites too? Unfortunately not. Weakened colonies are plundered by stronger ones—after all, where else can nectar be more easily foraged than where the stocks have already been fully processed?—and the raiders are in turn jumped on by the *Varroa destructors*, which hitch a ride with them to other, possibly uninfected hives. Furthermore, there are around a dozen serious diseases and parasites affecting honeybees that beekeepers keep under control by using chemicals that are to some extent harmful.

Can all these factors combine to explain the phenomenon that has become famous under the name of Colony Collapse Disorder (CCD)? Beekeepers, particularly in the USA but also in Europe, have come to accept that in some years their colonies simply disappear without a trace. Only the queen and a few bees remain on the honeycomb, which is well filled with honey and pollen. All the others are gone, and no nurse bees remain to feed the abandoned brood. There are no bodies of bees in the hives, none near the hive opening, and none nearby. They have disappeared, apparently without any cause, without previously displaying any symptoms of disease, and without showing up anywhere else.

On the basis of this dramatic development, a growing number of scientists worldwide are becoming interested in the problems of the honeybee, both researching the causes and attempting to find solutions. Some beekeepers are also seeking alternatives to conventional beekeeping in order to focus on their natural living habits and reproductive practices. There is hope that in this way bee colonies can be invigorated and then use their own strengths to better come to terms with damaging environmental factors that can affect tended

bees which are completely dependent on human beings for support. After all, bees have survived on this planet without human support for at least 80 million years.

Over this time they have not only adapted to continuous changes in their environment but also perfected the art of coexisting with humans—without whom they successfully survived for centuries. Experts believe that the oldest preserved specimen found in amber belonged to the eusocial variety of bees. The eusocial bee is strictly organized, disciplined, and efficient—it's not surprising that humans quickly realized what an excellent partner this insect could be. Unlike a farm horse or load-bearing elephants, bees are not forced into doing something that they wouldn't usually be doing. Everything from which we profit—the hauling of sweetness back to the hive and creating the preconditions for a successful harvest—they do better than we could ever teach them to. All we humans have to do is monitor an existing, functioning system. But now it is becoming apparent that human intrusions in the functioning system have destabilized it.

In the USA, one-sixth of all bee colonies stem from only 308 queen bees, which has led to a massive depletion in genetic diversity. Worldwide, the flagging situation of the honeybees can also be traced to the fact that the gene pool is continually being reduced. The focus on breeding bees that tend to industriousness and gentleness has come at the expense of their health, their ability to live.

Like the documentary *More Than Honey*, this book of the same name follows people who live with, for, and from bees: large-scale operators, beekeepers, breeders, and scientists. It looks at those who transport their bees over thousands of kilometers across the continent, those mailing them throughout the world, those wanting to protect bees through racial purity, those trying to look into their brains, those wanting to replace them with their own labor. As diverse and, to some extent, absurd as the respective approaches seem, all the participants have a common love of bees—and still something is wrong. It would be disastrous if the relationship between humans and bees over thousands of years became a war between civilization and nature.