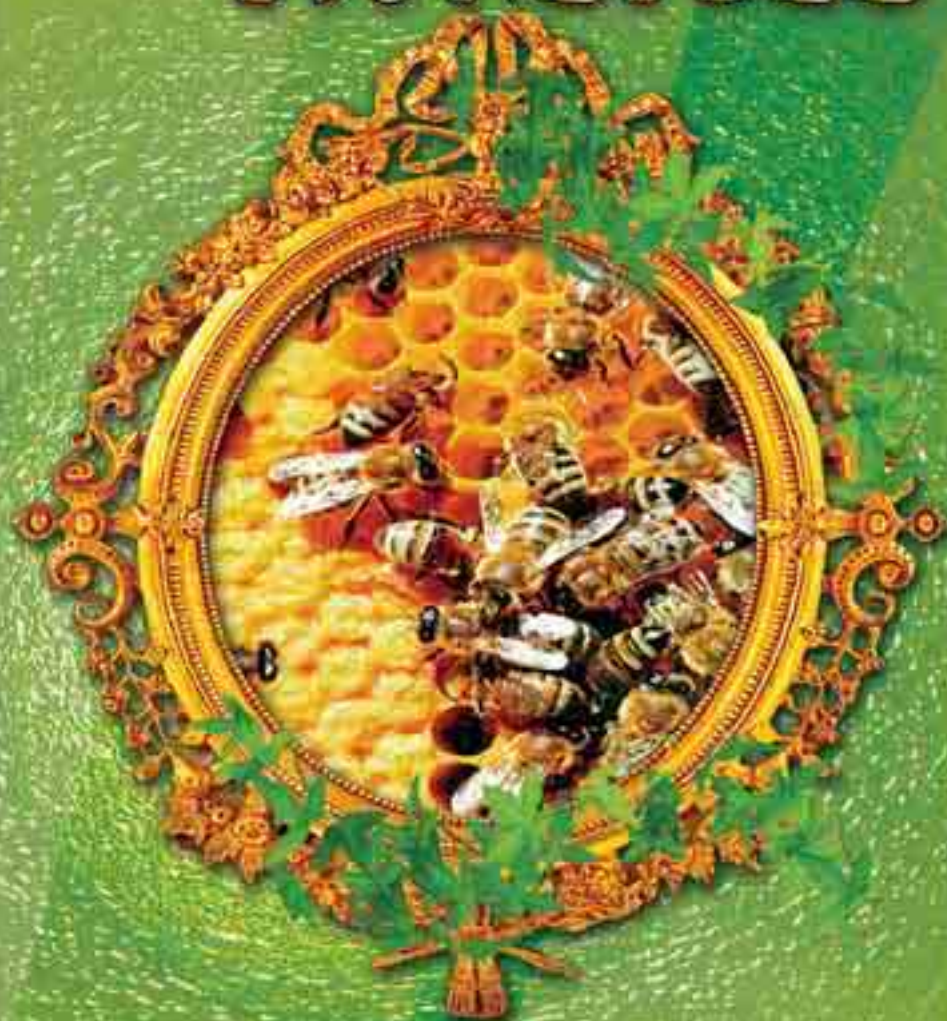


الله  
رسول  
محمد

THE  
MIRACLE  
OF THE  
HONEYBEE



HARUN YAHYA

The honeybees dealt with in this book possess amazing properties: They possess the most astonishing knowledge of engineering and architecture in the animal kingdom, stand out from many other creatures in terms of their social lives, and means of communication.

In this book, the reader shall be seeing that there is no arbitrary "struggle for survival" either in nature or in the lives of bees, contrary to what the theory of evolution maintains, and that, like all creatures on Earth, bees act in accord with God's inspiration.



## About the Author

Adnan Oktar, who writes under the pen-name Harun Yahya, was born in Ankara in 1956. He studied arts at Istanbul's Mimar Sinan University, and philosophy at Istanbul University. Since the 1980s, the author has published many books on political, faith-related and scientific issues. Greatly appreciated all around the world, these works have been instrumental in helping many to return their faith in God, and, in many others, to gain a deeper insight into their faith. Harun Yahya's books appeal to all kinds of readers, regardless of their age, race, or nationality, for they focus on one objective: to broaden the reader's perspective by encouraging him or her to think about a number of critical issues, such as the existence of God and His unity, and to live by the values He prescribed for them.

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

اللَّهُ  
رَسُولُ  
مُحَمَّدٌ

## About the Author

Now writing under the pen-name of HARUN YAHYA, Adnan Oktar was born in Ankara in 1956. Having completed his primary and secondary education in Ankara, he studied arts at Istanbul's Mimar Sinan University and philosophy at Istanbul University. Since the 1980s, he has published many books on political, scientific, and faith-related issues. Harun Yahya is well-known as the author of important works disclosing the imposture of evolutionists, their invalid claims, and the dark liaisons between Darwinism and such bloody ideologies as fascism and communism.

Harun Yahya's works, translated into 57 different languages, constitute a collection for a total of more than 45,000 pages with 30,000 illustrations.

His pen-name is a composite of the names Harun (*Aaron*) and Yahya (*John*), in memory of the two esteemed prophets who fought against their peoples' lack of faith. The Prophet's (may God bless him and grant him peace) seal on his books' covers is symbolic and is linked to their contents. It represents the Qur'an (the Final Scripture) and Prophet Muhammad (may God bless him and grant him peace), last of the prophets. Under the guidance of the Qur'an and the Sunnah (teachings of the Prophet [may God bless him and grant him peace]), the author makes it his purpose to disprove each fundamental tenet of irreligious ideologies and to have the "last word," so as to completely silence the objections raised against religion. He uses the seal of the final Prophet (may God bless him and grant him peace), who attained ultimate wisdom and moral perfection, as a sign of his intention to offer the last word.

All of Harun Yahya's works share one single goal: to convey the Qur'an's message, encourage readers to consider basic faith-related issues such as God's existence and unity and the Hereafter; and to expose irreligious systems' feeble foundations and perverted ideologies.

Harun Yahya enjoys a wide readership in many countries, from India to America, England to Indonesia, Poland to Bosnia, Spain to Brazil, Malaysia to Italy, France to Bulgaria and Russia. Some of his books are available in English, French, German, Spanish, Italian,



Portuguese, Urdu, Arabic, Albanian, Chinese, Swahili, Hausa, Dhivehi (spoken in Mauritius), Russian, Serbo-Croat (Bosnian), Polish, Malay, Uygur Turkish, Indonesian, Bengali, Danish and Swedish.

Greatly appreciated all around the world, these works have been instrumental in many people recovering faith in God and gaining deeper insights into their faith. His books' wisdom and sincerity, together with a distinct style that's easy to understand, directly affect anyone who reads them. Those who seriously consider these books, can no longer advocate atheism or any other perverted ideology or materialistic philosophy, since these books are characterized by rapid effectiveness, definite results, and irrefutability. Even if they continue to do so, it will be only a sentimental insistence, since these books refute such ideologies from their very foundations. All contemporary movements of denial are now ideologically defeated, thanks to the books written by Harun Yahya.

This is no doubt a result of the Qur'an's wisdom and lucidity. The author modestly intends to serve as a means in humanity's search for God's right path. No material gain is sought in the publication of these works.

Those who encourage others to read these books, to open their minds and hearts and guide them to become more devoted servants of God, render an invaluable service.

Meanwhile, it would only be a waste of time and energy to propagate other books that create confusion in people's minds, lead them into ideological chaos, and that clearly have no strong and precise effects in removing the doubts in people's hearts, as also verified from previous experience. It is impossible for books devised to emphasize the author's literary power rather than the noble goal of saving people from loss of faith, to have such a great effect. Those who doubt this can readily see that the sole aim of Harun Yahya's books is to overcome disbelief and to disseminate the Qur'an's moral values. The success and impact of this service are manifested in the readers' conviction.

One point should be kept in mind: The main reason for the continuing cruelty, conflict, and other ordeals endured by the vast majority of people is the ideological prevalence of disbelief. This can be ended only with the ideological defeat of disbelief and by conveying the wonders of creation and Qur'anic morality so that people can live by it. Considering the state of the world today, leading into a downward spiral of violence, corruption and conflict, clearly this service must be provided speedily and effectively, or it may be too late.

In this effort, the books of Harun Yahya assume a leading role. By the will of God, these books will be a means through which people in the twenty-first century will attain the peace, justice, and happiness promised in the Qur'an.

## To the Reader

A special chapter is assigned to the collapse of the theory of evolution because this theory constitutes the basis of all anti-spiritual philosophies. Since Darwinism rejects the fact of creation—and therefore, God's existence—over the last 140 years it has caused many people to abandon their faith or fall into doubt. It is therefore an imperative service, a very important duty to show everyone that this theory is a deception. Since some readers may find the chance to read only one of our books, we think it is appropriate to devote a chapter to summarize this subject.

All the author's books explain faith-related issues in light of Qur'anic verses, and invite readers to learn God's words and to live by them. All the subjects concerning God's verses are explained so as to leave no doubt or room for questions in the reader's mind. The books' sincere, plain, and fluent style ensures that everyone of every age and from every social group can easily understand them. Thanks to their effective, lucid narrative, they can be read at one sitting. Even those who rigorously reject spirituality are influenced by the facts these books document and cannot refute the truthfulness of their contents.

This and all the other books by the author can be read individually, or discussed in a group. Readers eager to profit from the books will find discussion very useful, letting them relate their reflections and experiences to one another.

In addition, it will be a great service to Islam to contribute to the publication and reading of these books, written solely for the pleasure of God. The author's books are all extremely convincing. For this reason, to communicate true religion to others, one of the most effective methods is encouraging them to read these books.

We hope the reader will look through the reviews of his other books at the back of this book. His rich source material on faith-related issues is very useful, and a pleasure to read.

In these books, unlike some other books, you will not find the author's personal views, explanations based on dubious sources, styles that are unobservant of the respect and reverence due to sacred subjects, nor hopeless, pessimistic arguments that create doubts in the mind and deviations in the heart.

# THE MIRACLE OF THE HONEYBEE

Your Lord revealed to the bees: “Build dwellings in the mountains and the trees, and also in the structures which men erect. Then eat from every kind of fruit and travel the paths of your Lord, which have been made easy for you to follow.” From inside them comes a drink of varying colors, containing healing for humanity. There is certainly a sign in that for people who reflect.  
(Surat an-Nahl: 68-69)

**HARUN YAHYA**

*March 2007*

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Abbreviation used:

(*pbuh*): Peace be upon him (following a reference to the prophets)

**www.harunyahya.com**

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# INTRODUCTION: THE LIFE OF HONEYBEES

*And they have other uses for them, and drinks.  
So will they not be thankful? (Surah Ya Sin: 73)*

**C**ivil wars, slaughter, problems within families, people who kill without a qualm, children living on the streets, people freezing to death from a lack of shelter, murderers no older than children, youth gangs, civic and political corruption . . .

When one thinks about these social problems, which have become part and parcel of today's daily life, the same imperfection can be seen at the root of them all. This same common imperfection also underlies such corrupt moral values as injustice, fraud, hypocrisy and ruthlessness that cause these problems to emerge.

This grave imperfection is that people fail to think—and thus, fail to see the truth. For such people, all that matters is their own interests, their own lives. They are unconcerned by what goes on around them. At the same time, what limited topics they do think about, again center upon themselves. For that reason, they live within the confines of their own rights and wrongs. They regard living the course of their daily lives as sufficient, never sparing a thought for vital issues such as the reason for their presence in this world.

They never consider the features of the living things around them, or how it is that these have emerged so flawlessly and in such variety. They are therefore unaware that all these things—their own bodies, the equilibrium in the heavens, in short, everything and anything—are created by God. They are unable to properly appreciate Him, the Creator of the entire universe, and His infinite might. They never become aware of the reason for their own creation and the fact that they owe responsibilities to God. The fact is, however, that a great many verses in the Qur'an emphasize the importance of thinking and the fact that only thoughtful people will heed advice.

Verses refer to people who think and thus achieve awareness of the might of God:

**In the creation of the heavens and the Earth, and the alternation of night and day, there are signs for people with intelligence: those who remember God, standing, sitting and lying on their sides, and reflect on the creation of the heavens and the Earth: "Our Lord, You have not**

**created this for nothing. Glory be to You! So safeguard us from the punishment of the Fire.” (Surah Al ‘Imran: 190-191)**

The aim of this book is to overcome this mental idleness by presenting yet another of God’s miracles of creation. In addition, the honeybee is one of the creatures to which the Qur’an draws our attention. In Surat an-Nahl, God reveals that bees act in the light of His inspiration:

**Your Lord revealed to the bees: “Build dwellings in the mountains and the trees, and also in the structures which men erect. Then eat from every kind of fruit and travel the paths of your Lord, which have been made easy for you to follow.” From inside them comes a drink of varying colors, containing healing for humanity. There is certainly a sign in that for people who reflect. (Surat an-Nahl: 68-69)**

These verses emphasize bees’ making their own homes, taking nourishment from every kind of flower and producing honey. As you’ll see in the following chapters, all such activities in the hive are performed by workers. A hive contains worker bees, a queen bee, and male bees (or drones). Workers carry out almost all the tasks in the hive. In addition, the queen has the extremely important function of ensuring the hive’s continuation. The sole function of the males in the hive is to fertilize their queen. They carry out this task within their short life spans, and then die.

In addition to examining these features of bees, this book also considers many other matters, such as how tens of thousands of bees are able to live together in the hive with no difficulty, how they follow directions, and how they produce honey. With verses from the Qur’an, we shall once again be seeing that there is no arbitrary and random “struggle for survival” either in nature or in the lives of bees, contrary to what the theory of evolution would have us believe.





## **Intelligent Design, in other words Creation**

### **In order to create, God has no need to design**

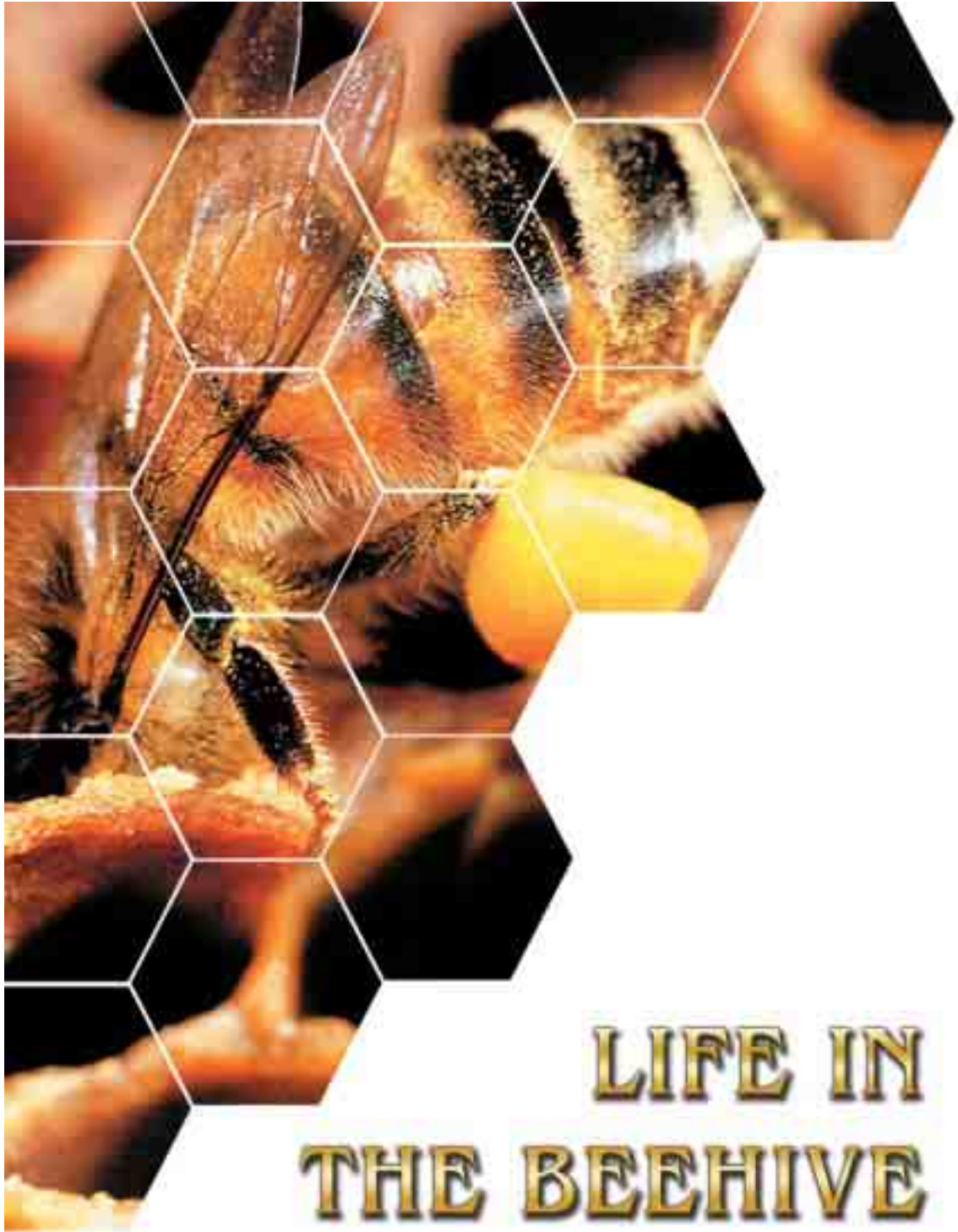
It's important that the word "design" be properly understood. That God has created a flawless design does not mean that He first made a plan and then followed it. God, the Lord of the Earth and the heavens, needs no "designs" in order to create. God is exalted above all such deficiencies. His planning and creation take place at the same instant.

Whenever God wills a thing to come about, it is enough for Him just to say, "Be!"

As we are told in the verses of the Qur'an:

**His command when He desires a thing is just to say to it, "Be!" and it is. (Surah Ya Sin: 82)**

**[God is] the Originator of the heavens and Earth. When He decides on something, He just says to it, "Be!" and it is. (Surat al-Baqara: 117)**



# LIFE IN THE BEEHIVE

*And in your creation and all the creatures He has spread  
about there are signs for people with certainty.  
(Surat al-Jathiyya: 4)*

**B**ees constitute a number of families, with some 20,000 species. They possess the most astonishing knowledge of engineering and architecture in the animal kingdom, stand out from many other creatures in terms of their social lives, and amaze scientists who study their means of communication.

The bees dealt with in this book possess rather different properties from other insect species. They live in colonies, building their nests in tree trunks or similar closed areas. A bee colony consists of a queen, a few hundred males, and from 10,000 to 80,000 workers. Of these three very different-looking bees, two—the queen and the workers—are female.

There is one queen to each colony, and she is much larger in size than the other bees. Her main task is to lay eggs. Reproduction can take place only by means of the queen, and no other females are able to mate with the drone males. In addition to laying eggs, the queen also secretes important communicative substances that maintain the unity of the colony and the working of the various systems inside it.

The drones are larger than the female workers, though they lack stings and the necessary organs to collect food for themselves. Their only function is to fertilize the queen. The worker bees perform all such other tasks that you might imagine, including making the waxen combs in the hive, gathering food, producing royal jelly, regulating the temperature in the hive, cleaning it of debris and defending it.

There is order in every phase of the life in the beehive. Every task, from the care of the larvae to meeting the general needs of the nest, is performed to the full. This can be seen more clearly when we detail the care and altruistic behavior that the other bees display to their young.



## HOW BEES CARE FOR THEIR YOUNG

The young of some creatures require greater care than the young of others. In particular, creatures that reach adulthood via various stages, such as the egg, larva and pupa of a moth or butterfly, require a different form of care at each stage.

Bees also go through a number of growth stages. Young bees reach adulthood by completing their larval and pupal stages. Throughout this period, which begins with the queen laying her eggs, bees take great care of their developing young.

All responsibility for caring for the larvae falls to the worker bees in the hive, which prepare incubation cells in a region specially set aside in the combs where the queen can lay her eggs. The queen bee comes here, and after checking the cleanliness and suitability of each cell, she deposits one egg in it and moves on.

Once the conditions essential to the development of the eggs have been met, a great many other factors must be organized, including meeting the food needs of the larvae that will hatch from them, the stabilization of the cell temperature, and special recurring inspections of the cells. The worker bees take great care of the larva, and employ intricate methods to do so.

### **The Worker Bees' Special Care of the Larvae**

After about three days, the eggs that the queen placed into the cells with enormous sensitivity hatch and white, maggotlike larvae emerge.<sup>1</sup> These hatchlings have no eyes, wings or legs. They bear no resemblance to bees at all.

The worker bees feed the newly-hatched larvae with great care and selflessness. In fact, it has been established that worker bees will visit any single larva some 10,000 times during its period of growth.<sup>2</sup> For the first three days after they hatch, the larvae are fed on royal jelly. During this larval stage, the young bees are fed constantly and undergo their greatest physical development. As a result of their regular feeding during this phase, the larvae's weight increases by up to 1,500 times in only six days.<sup>3</sup>

In the hive, there are thousands of larvae, and as many worker bees to look after them. These nurse bees are in a constant state of motion and easily monitor the eggs and larvae. Although the feeding needs of these thousands of larvae change from day to day, there is never any confusion. The worker bees never grow confused over such details as the age of the larvae



or each one's nutritional needs.

This is most astonishing, because in the hive is a very large number of larvae of different sizes, from eggs laid by the queen at different times. The workers adopt a feeding program for the young bees during the larva stage, based on how many days old they are. Nevertheless, the nurse bees experience no problems with their feeding of the larvae.

The larvae within the hive continue growing in specially prepared combs, and on the seventh day, a surprising phenomenon transpires. Each larva stops eating, and worker bees seal the entrance to its cell with a lightly domed wax cover.<sup>4</sup> At this point the larva imprisons itself here by spinning around itself a papery cocoon from a substance it generates itself.<sup>5</sup>



The bee larvae thus move on to their pupal stage. Before we examine the details further, one particular point requires special attention—the nature of the substance from which they weave their cocoon, produced by the two silk glands on the larva's head.

**Bee larvae, resembling maggots, hatch after three days from eggs laid by the queen.**



**Within 6 days, bee larvae reach 1,500 times their body weight and are barely able to fit into the cells. (Left) After that, growth stops and their pupal stage begins. (Right)**



One characteristic of this substance is that after coming into contact with the air, it hardens very quickly. The protein known as fibroin which it contains is a powerful bactericide and prevents infection. Scientists studying bees estimate that the cocoons they weave protect these pupae from germs.

The material used in weaving the cocoon consists of a combination of different chemical substances in specific proportions:

1. The elastic protein fibroin makes up 53.67%, a compound that includes glycol (66.5%), alanine (21%), leucine (1.5%), arginine (1%) and tyrosine (10%).

2. Sericin, a gelatin-like protein that consists of 29% serine, 46% alanine and 25% leucine, constitutes 20.36%.

3. Other proteins constitute another 24.43%.

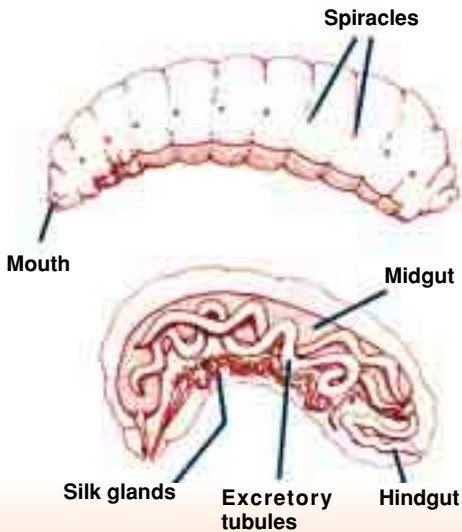
4. 1.39% is wax.

5. Fat and resin constitute 0.10%.

6. Coloring material adds a trace element, at 0.05%.<sup>6</sup>

The formula for this thread with which the larvae spin their cocoons is produced in exactly the same way in each bee. For millions of years, bee larvae have weaved their cocoons using thread with that exact formula. Moreover, the bee larvae produce this complex substance only when they need it, just before their pupal stage. Bearing these facts in mind, a number of questions arise. For instance, how is this substance suddenly produced in the larva's body? Can a larva, without eyes, wings or legs, which has never seen the world and is unaware of the kind of life it will lead, decide on its own to produce such a substance? Did the larva hit upon the formula for the protective chemical substance on its own? Did it succeed in producing it by itself? Who placed these necessary chemicals in the larva's body?

It is of course impossible for the larva—which is unable even to move by itself, whose care is provided by other adults, which is unable to see or hear and possesses only the most basic vital functions—to form the thread used in the cocoon on its own. Even claiming that such an ability were possible would be to distance oneself from science and reason, because



On the left is the anatomical structure of larvae, whose care is undertaken by other bees. It is absolutely impossible for such a creature, which resembles an eyeless morsel of flesh, to make its own decisions and to produce the chemical substances necessary for its development.



Developmental stages of young bees

such a claim would be tantamount to accepting that the larval bee possesses the information needed to manufacture the chemical formula and is capable of mathematical calculations. That would be an unscientific fantasy.

However, one most important point needs emphasizing here. Even if the creature in question did possess conscious awareness, that would still alter nothing, because it is out of the question for any living thing to develop, on its own, a system, which doesn't already exist in its body. Human beings, for example, are the only living things in nature which possess logic and reason. Despite that, however, it is impossible for humans to develop inside their own bodies' systems to enable the production of even a very simple chemical formula. That being so, it would be illogical and irrational to maintain that an insect could do something that human beings, with their reason and consciousness, cannot.

How does the thread used by the larva in cocoon spinning come about?

In order to answer this question, let's first enumerate the substances that constitute it. One of these, fibroin, is a combination of glycol, alanine, leucine, arginine and tyrosine, in specific proportions. Another of its components, sericin, is a compound of very exact proportions of serine, alanine and leucine. The thread used by the larvae in spinning their cocoons also contains such substances as wax, fat and resin.

As we have seen, a large number of chemical substances need to come together in very exact proportions to form the thread. Suppose we now conduct an experiment and wait for the simplest substance among these to come into being by itself. No matter how long we wait, no matter what processes we carry out, the result will always be the same. Whether we wait for days, months, or even millions of years, not one of the atoms comprising these substances, let alone those substances themselves, can ever come into existence by chance. That being so, it's totally illogical and irrational to claim that each substance in the thread the larvae use to spin their cocoons emerged by chance, and that later—again by chance—they came together to form the thread itself.

The formation of this thread is just one of the many processes necessary in order for a bee to hatch out of its chamber and become able to fly. All these mechanisms have to be present in order, at exactly the same time, in order for the larva to develop into an adult bee. The slightest defect, and the bee larva will fail to develop, leading to its death. That, in turn, will lead to gradual extinction of the species. The conclusion we reach is that, contrary to what evolutionists would have us believe, bees did not emerge of their own accord over the passage of time, but came into being in a single moment, with all their systems in working order. This shows that bees are the work of a Creator. That Creator is God, Who rules the entire universe and Who possesses superior wisdom.

It is God Who sets out the sorts of features that bees should possess, Who creates all of these in a perfect form, Who inspires the larva to spin its cocoon—and Who, in short, directs every action that bees take.

## The Pupal Stage

After the worker bees cap the larva's chamber, it enters the pupal stage and remains in its cell for 12 days.<sup>7</sup> During that time, no external change can be observed in the cell. Yet within it, the pupa is constantly developing. Three weeks after the queen bee laid the egg in the cell, its wax cover is torn open, and a honeybee emerges, ready to fly. The pupa's outer shell remains in the cell as a dead, cast-off sheath.

The honeybee that emerges from the cell begins its life span of six weeks or so as a result of these developmental stages it has undergone.<sup>8</sup> The bee emerges from the cell as an entirely new creature, resembling neither the larva nor the pupa. With the completion of its final stage of development, the bee emerges from the pupa with all the perfect systems it will need in order to survive—a phenomenon that deserves consideration. Every structure and attribute the bee possesses has formed inside a small, entirely closed area. Its specially structured wings it will use to travel long distances, the compound eyes created for all the functions they will perform, the sting it will use against enemies, its glands, the system which enables the production of wax, its reproductive system, the leg hairs that allow it to gather pollen—in other words, all its physical systems develop



**During the pupal stage, all of a bee's adult physical characteristics form in a confined area. When a bee emerges, its wings, eyes and all of its physical systems are ready for life in the outside world.**



within its cocoon during the pupal stage.

How did the pupa turn into a bee? How did the growth stages of the bee first emerge? Who or what defined that process? Was it the bee itself—or chance, as evolutionists would have us believe—or a more powerful force than either of these?

The answer to these questions is clear. It is absurd to claim that the insect inside the cocoon could carry out the necessary changes within itself, in full knowledge of what it will need in the outside world. It's totally out of the question for the eye or digestive system, or substances such as enzymes and hormones, to form inside a pupa that develops as a result of happenstance changes in itself. Neither can there be any question of an external intervention in the pupa.

During the pupal stage, neither chance nor the bee itself enables the perfect completion of each of the bee's organs, with all the functions they will require. Such a flawless development can only be performed by a superior and matchless Power—God, Who is matchless in creation.



Every bee emerges from the cell with all its bodily structures fully formed. Neither happenstance nor the bee itself can bring this about.



When a bee opens the cover of its cell and emerges, its hairs are wet for the first few moments. Shortly afterwards, its hairs dry and the bee begins to perform its duties in the hive.





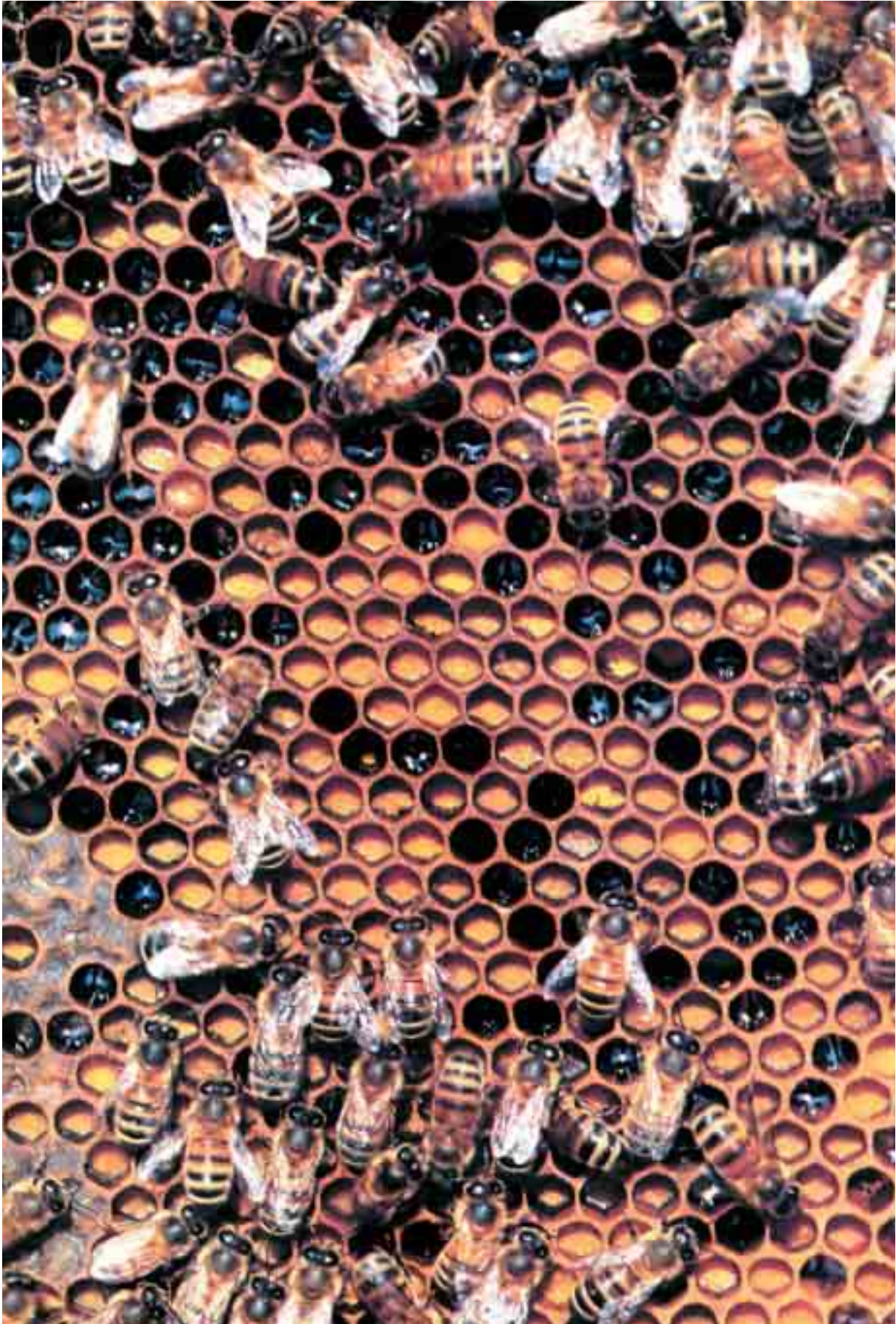
## **DIVISION OF LABOR, AND THE ORDER IN THE HIVE**

The number of bees in a hive varies between 10,000 and 80,000. Despite the large number of insects living together in this way, never is there any interruption in the functioning of the hive nor any confusion within it, thanks to the flawless division of labor and discipline among the bees.

The order within the hive is particularly striking. For that reason, scientists have performed very detailed studies of bees, starting with how that order is established inside the hive, the criteria by which tasks are divided, and how such enormous communities are able to cooperate so comfortably. The results they came up with proved to be most thought-provoking for the researchers themselves. In particular, proponents of the theory of evolution—which maintains that living things came into being by chance—were forced to consider the contradictions, which now confronted them.

The concept of the “struggle for survival,” one of the fundamental tenets of the theory of evolution, is just one of the inconsistencies now in question. According to evolutionists, every living thing in nature fights to protect its own interests. Moreover, according to this twisted perception, the reason why a living thing cares for its young is a desire for the survival of its own genes, in other words, nothing more than an instinct. “Instinct” is in any case the explanation that evolutionists proffer to account for any behavior they can’t explain in any other way. Yet they are unable to offer a logical explanation of how these instincts could have emerged in the first place.

Evolutionists maintain that instinct is a feature acquired through the mechanism known as natural selection. Natural selection mandates that all forms of change beneficial to a living thing should be selected and made permanent in that living thing and thus transmitted to subsequent generations. On careful inspection, however, it’s clear that consciousness and some decision-making mechanism are necessary for any such selection to be made. In other words, a living thing must first engage in a given





form of behavior, then determine that such behavior would give it significant long-term advantages, and then, as the result of a conscious decision, make that behavior “instinctive” and permanent.

Yet no such decision-taking mechanism can belong to any of the living things in nature. They are not only unable to select and propagate any form of behavior that might prove advantageous, but they are even unaware of their own situation.

Take the example of the cocoon-spinning larva examined in the preceding section. At a specific time, as we saw, worker bees cap the opening of the cell in the comb and the larva enshrouds itself in its own cocoon. What is more, all honeybees, whether they live in Africa or Australia, have been carrying out these same processes for millions of years. In other words, this instinct is common to all bees. Yet how do the worker bees and larvae establish that the most suitable developmental environment is within the cocoon? Is it possible for them to calculate this and make the necessary decisions?

At this point, evolutionists find themselves in a grave inconsistency. The series of selections they claim can be made only by a superior power. Only a conscious entity can give these creatures the features and instinctive behavior they require. Yet to accept that premise is to accept the existence of a Creator. To put it another way, the flawless design in nature belongs to God, and all forms of behavior defined as “instinctive” are inspired by Him. Evolutionists are actually well aware of this. They know that such a small and unconscious creature as the honeybee can never possess these extraordinary abilities by its own will. Yet even though evolutionists see the superior power of God and realize the impossibility of their own claims, still they refuse to abandon their theory.

In the past, there have been people who shared that exact same mindset. At the time of Prophet Moses (peace be upon him), there were some who ignored the evident miracles that this blessed prophet performed and continued to deny the manifest existence of God. In the Qur’an, God re-

**According to evolutionists, every living thing fights to protect its own interests. Yet bees exhibit a striking cooperation, and the order stemming from that cooperation—quite incompatible with evolutionist claims—is clear evidence that bees act in accordance with God’s inspiration.**



veals the situation of such people:

**And they repudiated them wrongly and haughtily, in spite of their own certainty about them. See the final fate of the corrupters. (Surat an-Naml: 14)**

## ADMISSIONS BY EVOLUTIONISTS

During their studies of life and nature, scientists have encountered very different proofs of creation in not one or two, but hundreds, thousands and even millions of species. Countless times, therefore, they've had to admit their claims with regard to instinct are meaningless.

These words by the geneticist Gordon Taylor clearly reveal the dilemma facing evolutionists:

When we ask ourselves how any instinctive pattern of behavior arose in the first place and became hereditarily fixed, we are given no answer . . . .<sup>9</sup>

In *The Life and Letters of Charles Darwin*, Darwin's son Francis described the difficulties faced by his father in this regard:

Chapter III. of the Sketch, which concludes the first part, treats of the variations which occur in the instincts and habits of animals . . . It seems to have been placed thus early in the Essay to prevent the hasty rejection of the whole theory by a reader to whom the idea of natural selection acting on instincts might seem impossible. This is the more probable, as the Chapter on Instinct in the *Origin* is specially mentioned (Introduction, page 5) as one of the "most apparent and gravest difficulties on the theory."<sup>10</sup>

The situation that the theory of evolution found itself in with regard to instincts was also admitted by Charles Darwin himself, in various ways. For example, this is how Darwin confesses that animal instincts overturn his theory in his *The Origin of Species*:

Many instincts are so wonderful that their development will probably appear to the reader a difficulty sufficient to overthrow my whole theory.<sup>11</sup>

Regarding the impossibility of instincts developing, Darwin had this to say:

It seems to me wholly to rest on the assumption that instincts cannot graduate as finely as structures. I have stated in my volume that it is hardly possible to

know which, i.e. whether instinct or structure, change first by insensible steps.<sup>12</sup>

Darwin, originator of the theory that bears his name, many times admitted the impossibility of the complex and advantageous forms of behavior seen in living things having been acquired by means of natural selection. However, he also stated why he persisted with that claim, despite its nonsensical nature:

Finally, it may not be a logical deduction, but to my imagination it is far more satisfactory to look at such instincts as the young cuckoo ejecting its foster-brothers,—ants making slaves,—not as specially endowed or created instincts, but as small consequences of one general law leading to the advancement of all organic beings,—namely, multiply, vary, let the strongest live and weakest die.<sup>13</sup>

The proponents of the theory of evolution resort to all sorts of means so as not to have to accept the existence of a supreme Creator. Indeed, in his own words quoted above Charles Darwin stated that it would be illogical not to accept that instincts were created—but that he found it more personally satisfying to persist in denial, based on the use of the imagination. The conclusion that emerges is a clear example of “repudiating in spite of one’s own certainty about it,” mentioned in the Qur’anic verse cited earlier.

The common features among the slave-making ants and cuckoos cited by Darwin, are 1) establishing tactics in the light of their objectives, 2) making plans compatible with that tactic, and 3) applying these to the letter. Developing a tactic to deceive another creature, and drawing up plans to destroy an enemy by identifying his weak points, come about as the result of reason and planning and judgment. The fact is, however, that neither ants nor cuckoos possess the powers of reason and judgment.

They receive no training in these areas. They have not learned from anyone else the tactics they employ. Neither do they possess any accumulated knowledge. These creatures, totally devoid of any power of thought, were created by God together with all the characteristics they possess. Thanks to their being inspired by God, they perform these functions requiring reason and judgment.

## ANIMALS THAT POSE AN INSOLUBLE DILEMMA FOR DARWINISM

The conscious behavior of bees is one of those surprises that pose an insoluble dilemma for followers of Darwin. Yet the theory of evolution cannot explain not only the behavior of bees, but that of a great many other creatures. Female cuckoos, for example, lay an egg in other species' nests and leave it to hatch and be reared by these foster parents. In this way, they ensure that their own offspring are looked after by another species. The young cuckoo hatches before the other eggs in the nest, even though it joins them later, and the first thing it does is to push the other eggs out, selecting a time when the parent birds are absent in order to do this. The young cuckoo thus guarantees its own survival. This conscious behavior, displayed

the moment the cuckoo hatches, is one of the phenomena that made it so difficult for Darwin to defend his theory.

Similarly, some ants kidnap the larvae of other species of ant and enslave them—another example of animal behavior that poses a dilemma for Darwin. The most important characteristic of these so-called slave-making ants is the way they fight to extract another colony's larvae, rear them, and then use them as slave labor for their own purposes. In doing this, slave-making ants imitate the alarm-scent given off by the other colony and instill panic in its members. As the members of the colony under attack flee, the slave-making ants seize their food stores and kidnap their larvae.

These pictures show a female cuckoo (side), a young cuckoo throwing the other bird's eggs out of the nest (middle), and the real owner of the nest feeding the young cuckoo, which has actually grown larger than its host (far right).



The picture to the immediate above left shows slave-making ants. The conscious behavior of these insects places evolutionists, who seek to defend the idea that living things emerged by chance, in a very difficult position. Such a difficult position, in fact, that the statements they make on this subject are actually admissions of the invalidity of the theory of evolution.

## **Bees Deal a Lethal Blow to the “Instinct” Claim**

No matter how much evolutionists may ignore the behavior of living things in nature, it refutes their claims. Bees, with their social order and conscious behavior, are just some of the animals that deal a fatal blow to the claims of evolutionists.

No “struggle for survival” of the kind that evolutionists propose is ever to be seen in beehives. On the contrary, bees behave most altruistically towards one another and display great cooperation. A comparison of the general order within the hive will be enough to demonstrate that the intelligent, altruistic and disciplined behavior of bees does not arise from these creatures themselves and cannot come about by chance.

If we imagine the same number of human beings living together as there are bees in a hive, and suppose that all these people met all their own individual needs, then we can more clearly grasp the importance of the tasks that the bees perform. Let us take the lowest population for a hive—say 20,000—and imagine that this number of humans lived together in a closed area. A huge number of problems will inevitably result, such as cleanliness, food, security and the like. Order in the full sense of the word will be established only following a division of labor carried out with precise organization.

In brief, it would be a most demanding process to set up the kind of order established by bees. Yet from the moment a bee emerges from the cell, it knows how that order is to be maintained, its duty within that order, and where, when and in what ways it needs to behave. Moreover, there are no other bees directing these newly-emerged adults and telling them what to do. These insects receive no formal training, yet they carry out their duties in a most disciplined way. That is because bees were created together with their characteristics by God. As we have already seen in Surat an-Nahl, God has inspired their behavior in them. It is God, Lord of infinite might and knowledge, Who brings about the order and impeccable discipline among the tens of thousands of bees living together in their dark hive.



## THE WORKERS: THE HIVE'S MOST INDUSTRIOUS MEMBERS

Worker bees in the hive are most important in ensuring order and that the work in the hive is performed without anything going wrong. Due to the large numbers of bees in the hive, a lot of work needs to be done. Like the queen, all the workers are female. As soon as they emerge from their cells, they set to work. The worker bees are responsible for much of this such as caring for the young, cleaning, feeding, food-gathering and storage of honey and pollen. Before considering the tasks of the worker bees in detail, we may set out their tasks in the following broad categories:

1. Cleaning the hive
2. Caring for the larvae and the young
3. Feeding the queen and the drones
4. Making honey
5. Building and maintaining the combs
6. Hive ventilation
7. Hive security
8. Gathering and storing such substances as nectar, pollen, water and resin.

Order inside the hive, with its tens of thousands of bees, is ensured by every individual carrying out its duties to the full. But what kind of order is there within the hive? How are the tasks distributed and defined?

The German scientist Gustav Rosch sought answers to these questions. As a result of his experiment, he concluded that the tasks assumed by the workers in the hive depends on their age. According to these results, worker bees take on completely different roles during their first three weeks of life.<sup>14</sup> These periods can be divided up as follows:

- First period: Days 1 and 2
- Second period: Days 3 through 9
- Third period: Days 10 through 16
- Fourth period: Days 17 through 20
- Fifth period: Day 21 and after.



Worker bees are responsible for just about all the jobs in the hive, home to a very large number of bees. The order within the hive ensures that the worker bees fulfill all their responsibilities. It is God, Who knows all, Who inspires the tens of thousands of bees in how to behave.

But age is not the only factor involved in determining a bee's tasks. Although each bee has its specific responsibilities, in an emergency, bees can also change their duties instantly. This is an enormous advantage in a society as crowded as the hive's. If the distribution of labor among bees were bound by fixed rules, then in the event of some unexpected happening, the colony might face grave difficulties. For instance, in case of a major attack on the hive, if only the sentry bees participated in the fighting and the rest all carried on with their own jobs, this would represent a serious danger to the hive. Yet what actually happens is that a large part of the colony takes part in the defense, and security becomes an immediate priority.

The way that bees suddenly change jobs is actually no different than someone working in the health field suddenly taking up employment in architecture or engineering. To make a comparison with human beings, people capable of serving in different capacities are described as intelligent. Yet when these characteristics, perfectly normal for human beings, come to apply to insects, matters are rather different because human beings acquire experience and an accumulation of knowledge in different areas by undertaking training or learning on the job. Yet bees do not. It is clear therefore that this is an extraordinary situation. How are the accumulated knowledge and abilities of bees to be accounted for? By whom were these skills taught to them?

According to the proponents of the theory of evolution, the root of these myriad abilities is either chance or the old mythological figure of "Mother Nature." Evolutionists maintain that the force they describe as natural selection turns bees into expert architects, dedicated caretakers and expert honey manufacturers. However, the concept of "nature"—a world consisting of birds, insects, reptiles, trees, stones and flowers—cannot produce a bee through a string of coincidences. It cannot create a bee's wing, or the ability whereby all the combs in a hive are crafted according to the same measurements, or the bees' reproductive systems—or, in brief, even a single component of the bee's body. That is because nature itself was also created by God. Every component of nature, and every detail thereof, was created by God.

Like all living things on Earth, bees act in accord with God's inspira-



tion. He is the one and only source of their intelligent behavior and the abilities they possess.

## The Main Stages in the Lives of Worker Bees

### *First Stage: Cleaning Brood Cells*

As soon as the worker bees hatch, they begin supporting activities in the hive in a most surprising manner. They have no guides or teachers to show them what to do, yet from the moment they emerge from their cells, they behave in a very conscious manner. Each bee has its own specific du-



When it first emerges from its cell, a bee's body is soaking wet, its hairs all stuck together. It combs out these hairs with its feet and then immediately sets about cleaning the brood cell from which it emerged, making it ready for the queen to lay another egg within.



One of the most important duties of worker bees is the cleanliness of the hive. The picture to the side shows worker bees opening the covers of the cells from which the larvae have emerged, checking whether these cells are fit for the queen to lay eggs in, and occupying themselves with cleaning.

ties. Tens of thousands of bees act with complete harmony, and order in the hive is quickly established with no confusion ever arising.

A worker bee's first job is cleaning. Emerging from the pupa, a bee immediately sets about this task. Beginning with its own cell, it cleans the brood cells for the first two days. Since the queen lays eggs constantly, there is an ongoing need for empty cells. As the cells empty out, they therefore need to be cleaned in preparation for new eggs.

The worker bee enters the cell it is to clean and remains in it sometimes for several minutes, carefully licking and cleaning the cell walls. In addition, the new-hatched worker bees also spend their first two days exploring the hive in order to get their bearings—since later in their lives, the workers will be responsible for the general cleanliness of the hive as a whole.<sup>15</sup>

### *Second Stage: Tending Larvae*

From the third day of their lives onward, worker bees set about the task of feeding the larvae, and take great pains over every detail of this job.<sup>16</sup>

Bee larvae require greater care and attention than the young of many other animals. But what is significant here is that how the larvae are fed changes according to such factors as the age of the larvae and their future roles within the hive. In their care of the larvae, the nurse bees stick to a special feeding menu.

Care of the larvae takes place in two phases, depending on their ages:

1) Worker bees spend the third through the fifth days of their lives feeding those larvae which have completed their third days. These they feed with the foodstuff known as “bee bread,” a mixture of pollen and honey.<sup>17</sup> Since larvae younger than three days are unable to digest this bee



The larvae in the hive all vary according to their age and how they must be fed. Despite this, the worker bees feed the larvae in total order, with no confusion ever arising over the duties they will perform in the hive. The workers visit the larvae in their cells throughout the day and look after them with the greatest care.

bread, they are given different food:

2) Newly-hatched larvae are given a kind of milk that the worker bees secrete. When the worker bees are six days old, a pair of glands on their heads go into action. These organs, known as the hypopharyngeal glands, secrete a very special substance known as “royal jelly,” whose properties have astonished scientists. This is because whether a larva turns into a queen bee or a worker depends on whether it’s fed this substance which the workers secrete. The nurse bees feed royal jelly to the larvae only for the first three days after hatching from their eggs; after which, as we have seen above, the larvae are then fed on bee bread.

However, bee bread is never fed to a larva that is intended to turn into a queen. Unlike other larvae, future queens are fed on royal jelly throughout their larval stage.<sup>18</sup>

### *Third Stage: Construction*

Starting on their tenth day, the bees leave the hive for the first time and familiarize themselves with the world outside. At this point, the wax glands on the bees’ abdomens begin to develop, maturing on the twelfth day and becoming ready to produce wax.<sup>19</sup> The activities of the hypopharyngeal glands have now been halted. Now 12 days old, the workers stop feeding the young and set about constructing honeycombs consisting of identical hexagonal cells. (Since this is a particularly complex procedure, we’ll examine it in detail later in this book.)

There is no need for the bees to constantly build combs in their hive. They construct them only when the site they live in fails to respond to requirements or when they migrate elsewhere. Apart from that, they generally use wax to repair the combs—a task that does not take up that much time. During this period, the bees perform three other very important jobs.

Two of these involve distributing foodstuffs—pollen and nectar—collected from the outside to the other bees and storing them in the comb cells. The bees take the honey from the nectar-gathering bees on their return to the hive, divide it among their hungry fellows as appropriate, and store the rest in honeycombs.<sup>20</sup>



When bees return to the hive pollen-laden, they either distribute it to the other bees or else store it in the combs.

### Major Cleaning in the Hive

During this period, the third job performed by the worker bees is cleaning the hive, which is essential to the health of the colony. Bees of this age drag outside the hive all sorts of waste material—comb caps that have served their purpose, the bodies of bees which have died, remains of cocoons and waste materials from bees that have newly emerged from their cells—and deposit it some meters away.<sup>21</sup>

However, if something is too large for them to carry, they cover it with a substance known as propolis, also known as bee glue, which they produce by adding saliva to the sticky resin that they gather from the buds of some trees. They then collect this substance in special structures called pollen baskets on their hind legs and carry it back to the hive. One characteristic feature of propolis is that it prevents any bacterial growth.<sup>22</sup>

Bees make a particularly accurate use of propolis's bactericidal qualities. By using it to cover intruding insects that they have killed but which are too large for them to drag outside the hive, they engage in a kind of mummification process.

If you carefully consider this last sentence, you will perceive the most astonishing details. Consider the way in which propolis is used and the functions performed by the bees.

First of all, bees apparently know that when a living thing dies, its body will decay and that the substances resulting from its putrefaction



**As can be seen in the pictures to the side and above, bees use their mandibles to scrape resin off of trees.**

could sicken the hive's inhabitants. Somehow, they are also aware that in order to prevent its decay, the dead creature needs to be subjected to a specific chemical process. And so they use propolis, with its property of killing bacteria, for this mummification process.

But how do the bees—emerged as adults less than a month ago—know that this creature will decay and how to eliminate its eventual harmful effects? Furthermore, how could they have thought of using, much less manufacturing—the propolis? Who taught them to do this? How did the bees discover this substance in the first place? How did they come by the formula and learn to produce it? How did they transmit the knowledge of its formula to other bees and hand it down to subsequent generations of their own?



Clearly, bees can have no “advance knowledge” of such subjects as the knack of mummification, the ingredients and production of the antiseptic substance or how it can be used—much less that their own bodies have developed a system to manufacture this. Bees cannot think out all these details for themselves. Neither can they have possibly learned these processes, which require intelligence and knowledge at every stage, by chance, since chance cannot lead to conscious, rational behavior.

All this shows that bees must have been taught to carry out all these processes by another Intelligence. All of this has been inspired in bees by God, the Creator of all beings. Like everything else on Earth, bees submit to God, the Almighty Lord and Absolute Ruler of the universe:

**Exalted be God, the King, the Real. There is no deity but Him, Lord of the Noble Throne. (Surat al-Muminun: 116)**

### The Diverse Uses of Propolis

Bees also use propolis in the construction of their hive, employing this material to repair crevices and holes in the walls. Moreover, in some volcanic regions such as in Salerno in southern Italy, where temperatures often get very high, it has been observed that the addition of propolis into wax, the raw material of the combs, raises the melting point of the wax so that the combs do not melt.<sup>23</sup>

When it comes to the collection and dispersal of propolis, there is a literal division of labor among the bees in different parts of the hive. A propolis-bearing bee returns to the hive in a different way than one carrying pollen. The pollen-bearer looks for an empty cell in which to deposit its cargo. But the propolis-bearer goes to a construction zone where this substance is needed and shows to the other bees what it has collected. If the workers need propolis, they approach the bearer and take as much as they need from its basket. They then immediately mix it with wax, forming a sticky adhesive that they use in the construction process.

The striking point is that the propolis-bearing bee does not become involved in the construction work, but waits for its fellows engaged in the task to relieve it of its load.<sup>24</sup> Every member of the bee colony has its own

particular job. Each one takes care of its own assignment, and the bees help out on another job only when something goes wrong in it. For that reason, a bee does not become involved in both resin gathering and patching and mummification, or also in dragging outside what has been mummified. Although every bee in the hive possesses the ability to perform all these tasks, it performs its own task in the best possible manner and leaves the other jobs to those of its fellows responsible for them.

Concerning the lives of the worker bees, one very important point must not be forgotten. All the changes of task in worker bees throughout their 5- to 6-week life spans are related to changes in their bodies. While some glands cease to function, new ones begin to go into action for an entirely different work.

During the bees' comb-making period, for instance, their wax glands develop. During the nursing phase, the glands mature that provide food for the larvae. When they reach the sentry phase, suddenly their glands start to secrete venom. If this were a chance development, then a great number of problems would be experienced. During the larvae tending phase, for example, venom might be secreted in the bees' bodies instead of royal jelly. That would spell the death of all the larvae and the extinction of the bees. Yet no problem actually arises during the course of all these changes, because everything happens in a very controlled manner, within a flawless order. It would be impossible for such an ordered system to come about through chance development.

In the fourth stage of their lives, worker bees undergo another change of function.

#### ***Fourth Stage: Guarding the Hive***

During the fourth stage of their lives, worker bees serve as guards at the entrance to the hive. Another change takes place in their bodies; their

***Everything in the heavens and everything in the Earth belongs to God. All matters return to God. (Surah Al 'Imran: 109)***





**A guard bee  
at the en-  
trance to the  
hive**

sting glands develop and they start to produce venom. At this stage, the bees stand sentry at the hive entrance and keep out uninvited guests. Every creature which approaches—bees included—can enter only after being identified by the guard.<sup>25</sup> If the guard bee should happen to leave her post, she is immediately replaced by another worker, who takes over the guard duty.

The way bees stand guard over the hive may be compared to how immigration officers work on national frontiers. A country's border security is of the greatest importance, for which reason a large number of precautions are taken. In the same way, security in the hive is also very important: Guard bees allow absolutely no strangers into the hive.

All the bees bear a very close resemblance to one another, yet any for-



**Workers releasing alarm chemicals through the hive**

eign bees entering the hive are immediately identified. Scientists researching the question of how bees accomplish this came up with some very surprising conclusions:

The odor of the hive is the most important factor how bees recognize one another; thanks to this odor, the bees are able to tell each other apart. Those that do not carry the hive's distinctive odor therefore represent a danger. Without exception, every outsider lacking the odor of the hive is attacked by the guard bees.

Bees that try to enter another hive are immediately identified by its sentries because of their different odors, and are either expelled or killed by the guards.

**Since they do not carry the hive odor, outsiders trying to enter it are attacked and repulsed by the guard bees.**



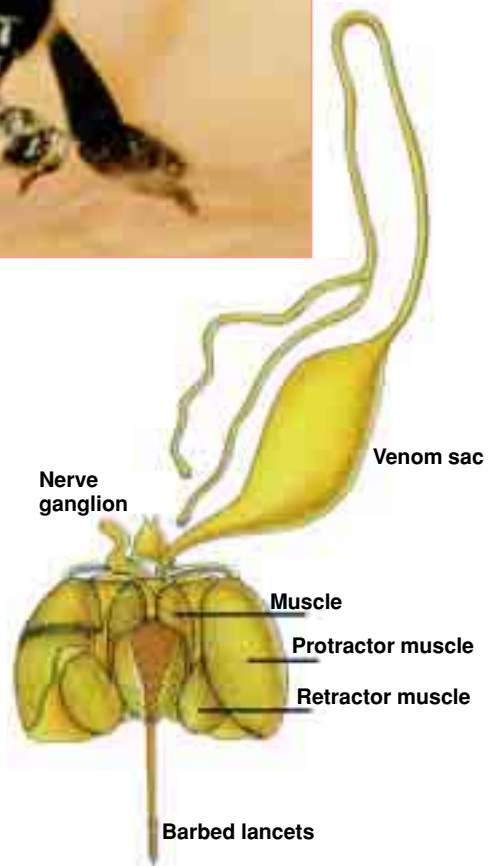


**When the hive is attacked, the guard bees immediately release a chemical substance, or pheromone. This pheromone and the tense posture of the bees set the whole hive in motion. The workers defend the hive at the cost of their own lives.**

When an outsider appears at the entrance to the hive, the sentries immediately display a forceful reaction, using their stings against any creature perceived as being from outside the hive. Right after the guard bees' initial intervention, other bees in the hive then generally join in the attack.

The signal which initiates a general attack by worker bees in the hive is a chemical substance (pheromone) given off by the stings of the sentries attacking the outsider. In some cases, in addition to the release of the pheromones that initiate the attack, the characteristic posture and behavior of the restless bees also represent an alarm signal to the other bees in the hive. Following the dispersion of the alarm chemicals, hundreds of bees swarm to the hive's entrance. The stronger the pheromone released by the guard bees, the greater the excitement and aggression of the others.<sup>26</sup>

These particular pheromones play a most important role in communication among bees, and have been used ever since the first bees appeared on Earth. Bees produce and release these chemicals with special features created for them in their bodies by God, and thus are able to maintain communications.



When a bee stings you, the barb on its stinger pierces your skin. In the process, the entire sting mechanism is torn out, leaving the bee mortally wounded. Even after the dying bee has departed, a set of muscles push the barb in deeper and continue to contract in such a way as to pump more venom into the wound. The small photograph shows a stinger detached from a bee's body.

The drawing above shows the bee-stinging mechanism, with such structures as the muscles and venom sac.

### **The Self-Sacrifice of Worker Bees**

In the period during which they serve as guards, these worker bees place their own lives in danger. That is because any bee that attacks an aggressor faces death because it is unable to retract its sting. Like the spines of a hedgehog, the bee's stinger is barbed that prevent it from being withdrawn from the skin of many animals. The guard bees can retract their stings only from other bees or certain other animals—and the guards suffer no harm in such cases. However, if a bee stings a human being and then seeks to fly away, the sting mechanism remains embedded in skin, and the bee is thus eviscerated. The area of the abdomen which is thus detached contains the venom sac and the nerves that control it. In the wake of this damage to its internal organs, the bee soon dies.

Another feature of the sac torn from the soon-to-be dead bee is that it still continues to pump venom out into its victim, even though it is no longer attached to the bee.<sup>27</sup>

The defense of the hive is a major responsibility that concerns the entire colony—one that the guard bees fulfill even at the cost of their own lives. Every bee in the hive behaves in the same way, and when the time comes, it assumes the role of sentry, protecting the colony at the risk of its own life.

This self-sacrificing behavior of bees refutes the evolutionists' claim that there is a "struggle for survival" in nature and that all living things seek to protect only their own line of descent.

### **The True Reason for Bees' Self-Sacrificial Behavior**

Self-sacrifice is a form of behavior that cannot be explained by the theory of evolution's "struggle for survival" thesis. Evolutionist claims take the position that living things fight to protect themselves and survive. But the fact is that it is inaccurate to say that nature consists solely of warring individuals, since living things display considerable behavior such as mutual cooperation and self-sacrifice. In reply to that, some evolutionists claim that living things sacrifice themselves to ensure the continuity of

their offspring, in other words that this represents an advantage to them. This claim contains a number of inconsistencies, however.

For instance, guard bees attack and fight insects such as hornets, which are much larger than themselves, without a moment's hesitation. The claim that bees do so out of a consideration of their own interests and that this represents an advantage to them raises a number of questions. Are bees able to think in terms of defending their colony's young as they engage in such behavior? Can bees possess the concepts of past and future and have concerns and expectations regarding these? What advantage can their deaths bring to worker bees as they defend their hive?

There is of course no question of bees thinking in such terms. Neither have individual bees anything to gain from this. Even if they did, there would still be no point in sacrificing their lives. Guard bees protect their hive solely because that is the task that God entrusted to them.

For a creature devoid of any reason, to establish a plan, act in the light of that plan, display exemplary cooperation and engage in self-sacrifice is behavior that cannot possibly have arisen by chance. This behavior has been taught to them—in other words, it has been inspired by God.

Just like all the other creatures on Earth, the bees that are the subject of this book act according to God's inspiration. All living things in the universe—horses, birds, insects, trees, flowers, leopards and elephants—have bowed their heads to God. Everything they do is by God's inspiration. God reveals His dominion over the living world in Surah Hud:

**... There is no creature He does not hold by the forelock. My Lord is on a Straight Path. (Surah Hud: 56)**

### ***Fifth Stage: Foraging***

In the final period of their lives, the worker bees' job is to collect food. They meet all their own nutritional needs from the pollen and nectar they gather from flowers. Pollen is rich in protein, and nectar is both a source of quick energy and the raw material for honey. Since bees are unable to forage for food in the winter, they store honey in the hive. They do not store

## HONEYBEES' DEFENSE STRATEGY: USING HEAT TO DESTROY THE ENEMY

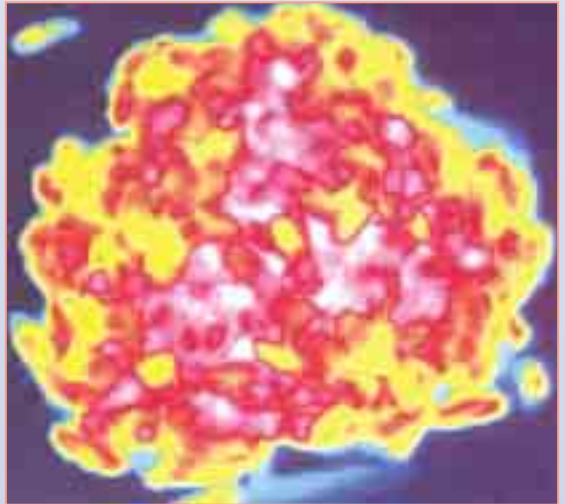
**T**he Japanese giant hornets are literally a nightmare for the introduced European honeybees. A colony of 30,000 European honeybees can be killed in roughly three hours by a group of some 30 hornets, which then occupy the hive. Local honeybees, on the other hand, have been created with a perfect defense mechanism.

When a hornet discovers a new colony, it secretes a special marking pheromone to inform the others of the fact. Since that pheromone is also detected by the Japanese honeybees, they all gather at the entrance of the hive to defend it. When a hornet approaches, some 500 bees take to the air, surround it in a tight ball and generate muscle heat.

In an infrared photograph taken of such an attack, the temperature in the white regions rises as high as 47 degrees centi-

grade (117° F). The honeybees are able to withstand this heat, but it spells death for hornets.

“Unusual thermal defence by a honeybee against mass attack by hornets,” *Nature*, Vol. 377, 28 September 1995, pp. 334-336.



The Japanese honeybees kill the attacking hornets by generating high temperatures.

pollen separately for the winter, but collect it in sufficient quantities for the younger bees to eat in rainy weather.<sup>28</sup>

The pollen they collect is not consumed directly, but is turned into a substance known as “bee pollen” or “bee bread.” The bees bring about this transition by adding nectar and various enzymes to the pollen collected by flowers.<sup>29</sup>

The job of collecting pollen and nectar falls to bees that are 21 days old. At this stage, their wax glands that served to produce wax stop secreting,





and the workers leave the hive to begin their new and dangerous jobs. It is hazardous to fly around outside among the flowers because all the bees' natural enemies, such as spiders and dragonflies, live there. In addition, this task is a rather tiring one, since the bees must constantly fly back and forth between the hive and the flowers, their source of food. Bees whose flight muscles wear out die soon afterwards.



**Foraging bees have some dangerous enemies, such as the mantis (above), dragonfly and spider.**

But meanwhile, their bodies are equipped with specially created systems to collect nectar and pollen. They swallow nectar to fill their internal honey sacs. They do not swallow pollen as they do nectar, but carry it back to the hive in small pouches affixed to the sides of their hind legs.

### **Bees' Pollen Baskets**

On the hind legs of bees are found slight concavities, just like spoons, surrounded by a fringe of hairs. This area is known as the "pollen basket," and serves to carry the pollen. The underside of the bees' abdomen is completely covered in soft hairs. The pollen sticks to these when the worker bee encounters a flower, and the hairs on its legs act rather like a comb, sweeping up the pollen and helping accumulate it in the pollen basket.<sup>30</sup>

When a bee reaches the age for food gathering, it fills its crop with a small amount of honey to give it enough energy before flying off. In addition, it uses this honey to place in its baskets the pollen it collects. When the pollen-gathering bee lands on a flower's anther, it uses its mouth and forelegs to scrape up the pollen it finds there and moistens it with the regurgitated honey in order to make it sticky. As the bee does so, some of the pollen sticks to its body hairs, so that bees sometimes appear as if they were covered in flour.

The Keys of the heavens and Earth belong to Him. He expands the provision of anyone He wills or restricts it. He has knowledge of all things.  
(Surat ash-Shura: 12)

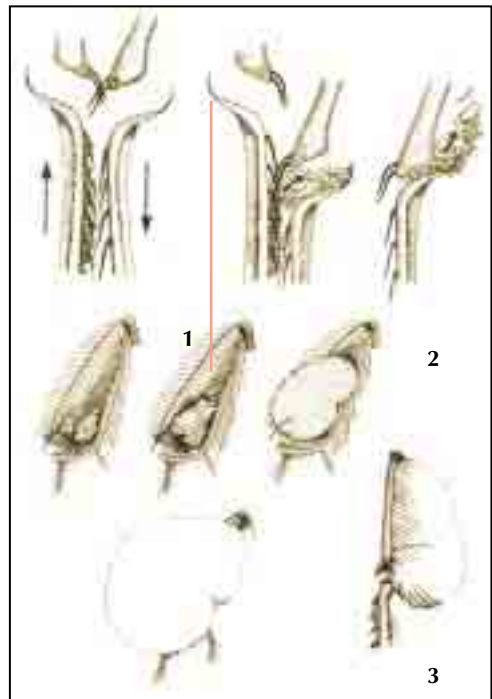


Bees sweep up this pollen into their pollen baskets while in flight. As they fly from one flower to another, they use the combs on their hind legs to collect the pollen stuck to their legs and bodies. By rubbing its hind legs against each other, a bee transfers the pollen gathered on each pollen comb to the pollen press on the opposing leg. The accumulated pollen is then forced into the pollen basket on the outer part of the leg. The pollen is thus collected in one place, and the bee continues doing this until, eventually, a large deposit of pollen forms, and the basket is filled. The bee occasionally strikes the outer surface of the basket with its legs in order to keep the pollen mass from falling off, thus settling it safely, and heads off back toward the hive. On arriving, the pollen is placed in cells specially set aside for it.<sup>31</sup>



Many insects collect pollen from flowers, but none achieve such productive results as bees, because their bodies are so ideally suited to pollen gathering. Even so, it requires considerable work, because after working for a very long time, the bee carries only two pollen packets back to the hive. It takes an average of 20 pairs of pollen packages to fill one honeycomb cell. This means the bees must work non-stop.<sup>32</sup>

From flowers, bees collect two distinct substances that are each very different to one another, both in terms of their contents, their manner of col-



**Bees use the special systems created by God in their hind legs to carry pollen.**

**1 – The bee scrapes the pollen collected on the combs, using its pollen rakes.**

**2 – The pollen is then pushed towards the pollen basket by pumping the legs.**

**3 – Finally the pollen, moistened with a quantity of regurgitated honey, is transported back to the nest.**



Thanks to their special mouthparts, hairy bodies and pollen baskets, bees can collect pollen in a far more productive manner than other insects do. These pictures show bees who have filled their baskets with pollen.



lection and where they are used. Bees need a different system to collect nectar from flowers from what they use for collecting pollen. That is because the location of nectar varies according to the plant's structure. In some plants, the nectar appears freely on the surface of the petals, and it is no problems for bees to reach it. In the flowers of other species, however, the nectar is much less accessible, being at the bottom of a long tube. Bees therefore need to be able to descend deep to retrieve the nectar from those regions.

This represents a difficulty for a great many insect species, though not for bees, since they have a special organ known as the proboscis—an elongated tubular mouthpart that allows them to reach nectar in the depths of a flower. They also use their proboscis to drink honey and water. The proboscis plays a vital role in exchanging foodstuffs among bees, and is also used in licking up the secretions from the queen bee and distributing them to the other bees. When not using its proboscis, a worker folds it up in a Z-shaped pattern into a cavity beneath its mouth, and then opens it out

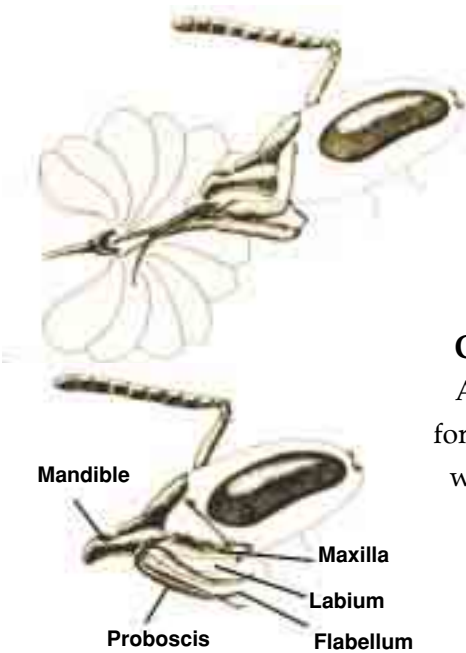
again when she wants to collect nectar, pollen or water.<sup>33</sup>

When a bee lands on a flower, drops of nectar flow first up this sucking tube, and then through the esophagus into the “honey stomach.” Bees collect as much nectar as they can carry there, then return to the hive. They need to visit between 100 and 150 flowers in order to fill their honey stomachs of 50 cubic millimeter capacity.<sup>34</sup>

The division of labor among bees is clearly dramatized in their collection and storage of nectar. A bee returning to the hive laden with nectar wastes no time in storing it away. Instead, it transfers the nectar from its mouth to those bees charged with that responsibility, leaving only enough

**Thanks to their flawless bodily structures, bees can easily collect nectar from the depths of flowers that other insects cannot reach. God has created bees together with features ideally suited to their duties.**





in its stomach to meet its own energy needs, then flies off again at once to the food source. Any bee to which the nectar has been transferred either gives it to still other bees or else stores it away, depending on the food needs of the hive on the day in question.<sup>35</sup>

### Other Duties

After having become adults and beginning to forage, bees can undertake all jobs. Their three-week life span is sufficient for this.

We have already mentioned that changes take place in the bee's body throughout her development, and how jobs in the hive change in direct proportion to bodily changes that take place at different times in the bee's body. But these changes are not irreversible. A bee's organs can regain their previous functions if the needs of the hive require it. For example, when the hive



The worker proboscis can vary in length from 5.3 to 7.2 millimeters (0.2087 to 0.2835 inches), depending on the race. The nectar of some flowers lies deeper down than in others. It's thus a major advantage for bees to possess a long proboscis ideally suited to extracting nectar from the base of such flowers.

The pictures at top left show the bee's proboscis in extended and folded positions. As can be seen below, bees fold their proboscis inwards in a Z-shaped pattern when not in use.

**He is God—the Creator, the Maker, the Giver of Form. To Him belong the Most Beautiful Names. Everything in the heavens and earth glorifies Him. He is the Almighty, the All-Wise.  
(Surat al-Hashr: 24)**



suffers any damage, either through an enemy attack or as the result of fire, adults no longer engaged in making wax may start to do so in order to repair the damage. Similarly, if the possibility of a problem in feeding the larvae arises, there may be others whose hypopharyngeal glands come back into operation to aid the nurse bees. When the honey stock is insufficient, a greater number of bees may forage out to collect nectar, or if the hive urgently needs to be cooled down, then the other bees stop whatever they are doing and immediately start ventilating with their wings. If the hive comes under a major attack, most of the bees join in its defense, and hundreds of workers congregate at the entrance to the hive to repulse the assault together.<sup>36</sup>

In short, every bee in the hive knows what sorts of needs may arise, and thus how and where they need to act. As we have seen so far, there is a “group consciousness” prevailing in everything bees do, allowing them to fulfill their responsibilities in a most successful manner.

Considering all this information, a most important conclusion emerges. To maintain that bees acquired all their behavioral and physical characteristics either of their own will or else by chance conflicts with reason, logic and science. Details such as the fact that all bees of the same age behave in a similar way, and that the order within the beehive has persisted unchanged ever since the appearance of the first bees, are clear indications that these insects are directed by an intelligence. All the knowledge they possess is given them by an Entity possessed of intelligence. It is God, with His infinite knowledge, Who inspires in bees what they need to do and what tasks they will undertake at different times. God creates everything within a specific order:

**He is God—the Creator, the Maker, the Giver of Form. To Him belong the Most Beautiful Names. Everything in the**

**He to Whom the kingdom of the heavens and the earth belongs. He does not have a son and He has no partner in the Kingdom. He created everything and determined it most exactly. (Surat al-Furqan: 2)**



**heavens and earth glorifies Him. He is the Almighty, the All-Wise.  
(Surat al-Hashr: 24)**

### **Temperature Regulation in the Hive**

Some living things use their own body heat in order to regulate the temperature of the environment in which they live. Those capable of doing this include warm-blooded creatures like mammals and birds. The body temperatures of a great many other cold-blooded creatures (lizards, snakes, tortoises, fish, snails, worms, lobsters, insects, etc.) change according to the temperature of their surroundings.

Bearing this in mind, it is striking that the temperature in beehives remains unchanged at 35 degrees centigrade (95 degrees Fahrenheit).<sup>37</sup> Although bees are unable to regulate the temperature in the hive with their own internal body heat, they regulate the temperature in the hive with the heat given off by their own movement. One of worker bees' most important responsibilities is this stabilization of the hive temperature. No matter what the temperature in the surroundings (tree trunk, rocky space, etc.), honeybees always keep the temperature in the hive under strict control. From the end of spring to autumn, they maintain a temperature of a constant 34.5 to 35.5 degrees centigrade (94-96°F).

Honeybees are strongly affected by temperature changes. Processes such as the production of wax and honey all take place at a specific temperature. Those most affected by changes in the hive temperature are the young, and for that reason, great care is taken over the temperature in the brood cells. Bees engage in various activities in order to stabilize the temperature in the hive regardless of the temperature changes over the course of the day. In the early morning, for instance, when air temperatures are coldest, the workers throng together around the combs and warm the eggs with their own body heat. As the day goes on and air temperatures start to rise, this mass of bees gradually disperses. If the temperature continues to rise, the bees start to beat their wings in order to ventilate this region and lower the temperature. They seek to lower the temperature by

directing the air current to the hive entrance and toward the combs.

On very hot days, bees use a rather stronger means of cooling. When the temperature in the hive rises to a severe level, rather than bringing pollen or nectar the foraging bees bring drops of water they've collected from various sources and sprinkle these over the brood cells.<sup>38</sup> They then set up an air current with their wings to evaporate this water. Via this method, the temperature soon returns to its previous level.<sup>39</sup> In one experiment, a hive was placed in direct sunlight on a day when the temperature had risen to 50 degrees centigrade (122°F). The bees were observed to be bringing in water constantly from a nearby source to keep the inside temperature at 35 degrees centigrade (95°F).

Bees use a similar method to the one they employ in cooling the hive when it comes to warming it during the winter. When the temperature falls in the hive, they first come together in a large cluster. The outer crust of bees varies between 2.5 and 7.5 centimeters (1 to 3 inches) thick, depending on the intensity of the cold. The rest of the bees, which are inside, are not as closely packed as those on the outside. These bees constantly move, providing heat for the cluster. (It is known that at 10 degrees centigrade (or 50°F), a bee can produce 0.1 calories of heat per minute.) The bees move about more in order to generate more heat. Those on the out-



**Bees achieve temperature balance in the hive by a number of methods. In the event that the hive temperature rises, the bees beat their wings to set up a current to cool it off again. (Above and side)**

side shrink together, thus ensuring their bodies make less contact with the cold air.

The food in the honey stomachs of the outside bees is soon expended. At this point, those bees on the outside and those on the inside change places.<sup>40</sup> By this method, bees are able to maintain the hive temperature at 35 degrees centigrade (95°F) even when the outside temperature drops as far as -30°C (-22°F).<sup>41</sup>

These solutions that bees employ in regulating the hive temperature are exceedingly effective and practical. The question that needs to be considered is how they discovered these solutions and how they arrived at the optimum hive temperature. It is most astonishing that an insect should be able to make such fine calculations.

First, it is essential for there to be some organ for measuring temperature in the bee's body. That being so the question then arises of how such an organ, as sensitive as a thermometer, came to exist. Since bees could not have come into possession of this system by chance, and cannot have identified what the hive temperature should be and how to maintain it by experimenting, then there must be a Power creating these abilities in bees.

It is impossible for bees to create all this themselves. Bees, most of whose adults live less than a month, cannot have worked out the design for this temperature-measuring system sited in their bodies, nor the information about when and how to heat their hive, by themselves.

All this leads us to one conclusion: Everything bees do is inspired in them by God, the Creator of all. The systems they possess and the matchless artistry also point us to Him.

## **The Death of the Worker Bees**

Worker bees bear the entire burden of the colony, and work without stopping from the moment they emerge from the pupal stage. Due to this heavy tempo, they only live for 3-4 weeks after they leave the hive and begin gathering food.

The chief cause of the death of workers is their never-ending search for

## EFFICIENT INSECT FLIGHT

**A**n article in the pro-evolution magazine *New Scientist* on 12 October 1996 stated that insect flight was significantly inefficient and unproductive, and that only 6% of the metabolic power expended was converted into mechanical power. The rest, it was claimed, was dissipated in the form of heat.

Jon Harrison of Arizona State University and his team then set about studying this, with astonishing results. There were actually very important reasons for the low efficiency in flight. These results were published in a report titled "Achievement of Thermal Stability by Varying Metabolic Heat Production in Flying Honeybees" in *Science* magazine (4 October 1996, Vol. 274, pp. 88-90). In these experiments, bees' body temperatures, flight metabolic rates and wing-beat frequencies were measured by changing the air temperature around the hive. When the air temperature rose from 20 to 40 degrees centigrade (from 68 to 104 degrees Fahrenheit), the wing-beat frequency decreased by 16% and the metabolic rate by 50%, while their thoracic temperatures remained stable. Bees' wing-beat frequencies registered a fall, but caused no problem in flight. From all this, it was realized that as the temperature rose, bee flight became more effective and productive. Bees' muscles, it was thus discovered,

are more efficient on hot summer days.

Harrison then researched the reason why bee flight was less efficient in winter. He concluded that the heat given off in ineffective, inefficient flights helped to keep them warm on cold days. This occupies an important role in regulating the hive temperature. The conclusion from these detailed studies was that bees' wing muscles serve two important purposes: to allow the bee to fly, but also to establish the required temperature in the hive. Thanks to their wing design, bees were able to vary their heat production and flight efficiency according to the surrounding conditions and in light of their requirements.

As this example shows, scientists studying a creature cannot arrive at accurate findings if they look for chance developments or faulty features. We see very clearly that there are actually flawless features in nature: All life forms possess the exact characteristics they need, and always have. There can be no doubt that this is God's flawless creation, with His infinite might and wisdom.

When people engage in research with that perspective in mind—in other words, when they seek to study that perfection—they can witness the superior art of creation in nature from much closer up and achieve results much faster.

food. As a result of this demanding activity, the foragers' brood food and wax glands soon degenerate. They also lose their hair after a total flight distance of about 800 kilometers (500 miles), and their flight muscles wear out.<sup>42</sup> Worker bees usually die while on duty, outside the hive.

The new individuals that hatch out in the autumn will assume charge of maintaining the colony. Since the emergence of these bees coincides with the beginnings of winter, they are unable to leave the hive and must live off foodstuffs already stored by previous generations of workers.

Despite the short life spans of the bees that make up the colony, the colonies themselves are rather long-lived—so much so, in fact, that barring such circumstances as fire and drought, they are able to survive for 20 years or more.

### **Bees Emerged in a Single Moment**

In examining the lives of bees, the point to concentrate on is how all the functions in the hive are performed by thousands of individuals, and yet, despite those large numbers, there is never the slightest confusion or disorder. The larvae never go hungry. Defense is never neglected, nor is the



**Foragers returning home with their pollen baskets full. This task of carrying pollen, which the workers perform during the final stages of their lives, is an exceedingly tiring one. Their bodies become damaged during the course of it, and they die shortly afterwards.**

service of the queen ever impaired. Bees behave most intelligently at all stages of their lives and successfully complete all the tasks entrusted to them.

The activities of worker bees are described in *The Marvels of Animal Behavior*, a book published by the National Geographic Society:

If you watch the workers, it soon becomes obvious that their behavior is consistent and that they do not shift aimlessly from task to task. One bee may spend an hour readying cells for fresh eggs; another moves across the combs to attend the queen; a third forages in the field. How does each worker know precisely what to do and when to do it? <sup>43</sup>

In order to carry out their jobs in the hive, as mentioned earlier, workers sometimes use special fluids and at other times, organs created for the task at hand. In order for a bee to survive, the properties it possesses all need to exist at the same time. The venom and stinger essential to the defense of the hive, the elongated mouthpart used to collect nectar from flowers, the hairs which allow pollen to stick to the forager's body, the comb-like hairs on their legs, and a great many other structures have all existed since bees first appeared on Earth. In addition, the behavior described by evolutionists as "instinctive" must also have existed since their first appearance. A bee has to know how to feed larvae, how to serve the queen, the best angle at which to build the combs for the easiest storage of honey, how to save wax and protect the hive, how to collect propolis, and how to tell its fellows where food is located—and all this from the moment of its emergence from its cell. In short, all bees' abilities must have been in existence for as long as bees themselves have.

Were only one of bees' features not to exist, then insuperable difficulties would arise, and these creatures would be unable to survive. This fact proves that bees could not have emerged over the course of time, in stages, as evolutionists would have us believe. In the absence of a single one of their properties and abilities, bees could not survive. Without stings, for example, they would be unable to defend themselves. Without the pollen baskets behind their legs, they would be unable to carry pollen back to the hive. If their proboscises were too short, they would be unable to suck up

nectar, and if they did not secrete wax, they would be unable to build combs. If they did not know how to care for the larvae and build the honeycombs, their hives would become extinct. Even if they had venom glands but lacked the knowledge to protect the hive, those glands would serve no purpose. In short, all bees' bodily systems and abilities need to have emerged at the same time, and in complete form, which cannot possibly have occurred by chance.

All this demonstrates that bees must have come into being in a single moment, and in their present-day forms. Bees were created by an all-powerful Creator, Who reveals Himself to us with the flawless features He has created in bees and all other species. That Creator is Almighty God, the Creator of the entire universe, Who possesses a mighty, infinite and incomparable knowledge. God is He Who is able to create everything, Who has knowledge of everything:

**It is God Who created the heavens with no support—you can see them—and cast firmly embedded mountains on the Earth so that it would not move under you, and scattered about in it creatures of every kind. And We send down water from the sky and make every generous species grow in it. This is God's creation. Show me then what those besides Him have created! The wrongdoers are clearly misguided. (Surah Luqman: 10-11)**

*Don't you know that  
God is He to Whom  
the kingdom of the  
heavens and the  
Earth belongs and  
that, besides God,  
you have no protec-  
tor and no helper?  
(Surat al-Baqara:  
107)*



## THE QUEEN BEE WHO ENSURES THE CONTINUITY OF THE HIVE

A brief look at the beehive reveals that the workers take particular care of one bee, far larger than themselves. The other bees supply all these bee's needs, such as feeding, cleaning and security. Although any hive contains tens of thousands of bees, there is only one queen, whose longevity is of vital importance to the entire hive. She ensures the continuity of the colony. In addition, discipline in the colony is ensured by substances she releases.

Throughout her life, the queen does nothing but lay eggs. She is always inside the hive, never leaves it, and lays eggs every day from early spring through late summer. The workers undertake all aspects of her care. As the queen moves around in the hive, a group of workers gather around her, feeding her constantly, stroking her with their antennae and licking

**The queen bee is of the utmost importance to the hive, keeping the colony alive. The worker bees therefore meet all her needs. This photograph shows workers taking a close interest in all aspects of the queen's welfare, feeding her with great care and ensuring her safety. It is God Who provides the workers with this dedication. The bees behave under His inspiration.**





her clean. In short, the queen does not involve in anything regarding her own care, because her only duty is to lay eggs to perpetuate the hive.

### **The Queen: A Rather Different Bee**

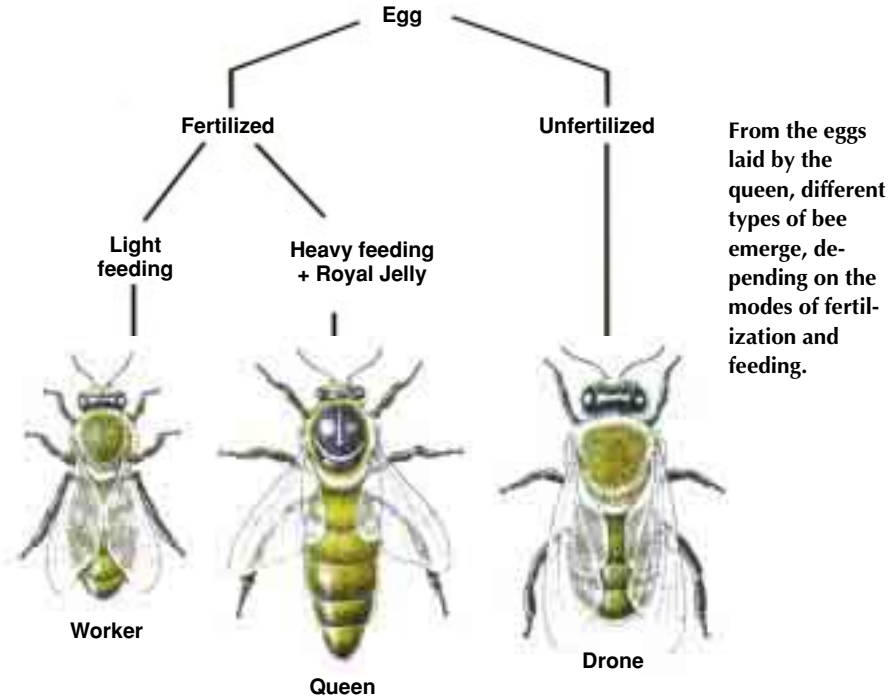
The queen bee is set apart from the other bees right from her larval stage. Queens are raised in different combs with different features from those of the other bees. This site where the queen is raised consists of special cells hanging upside down from the comb. Since she is larger than the other bees, these cells are also constructed on a larger scale.<sup>44</sup>

As has been emphasized in earlier sections, there is no difference between the egg that hatches into a queen and an egg that produces the workers. The queen is the result of special feeding with royal jelly over her six-day larval period, and emerges not as an ordinary female worker, but as one very different in terms of appearance and function. Workers are fed royal jelly for only three days, but the queen receives it for the full six days of her larval stage.<sup>45</sup>

The ingredients and amount of the royal jelly given to the queen are specially regulated. Research has established that while other bees are only given 3 milligrams throughout their larval stage, the queen is given 10 milligrams. Simply on account of this difference in feeding, the queen and a worker emerge as two very different creatures, with very different morphological characteristics from one another.<sup>46</sup>



**The larvae of queen bees are raised in special brood cells.**



### Differences between the Queen and the Other Bees

The queen differs in terms of her general structure and appearance. For example, although the workers are female like the queen, their ovaries are not developed—in other words, all worker bees are sterile. The queen's head and thorax are little larger than those of the workers. And unlike the worker bees, the queen's mandible is not suited to making wax cells. The queen bee's hind legs also lack the workers' hard hairs which fringe the pollen baskets. Most important of all, although the queen hatches from exactly the same sort of egg as the workers, she lives for from 4 to 5 years (except for those emerging in winter, who live for a few months), rather than just 5 to 6 weeks.

These are just a few of the general differences between the queen and the workers, which are set out in greater detail on the next page.

## THE DIFFERENCES AMONG HONEYBEES

Characteristic	Worker	Queen	Drone
<b><u>Sensory</u></b>			
Number of facets of compound eyes	4000 to 6900	3000 to 4000	7000 to 8600
Optic lobe of brain	Medium	Small	Large
Number of antennal plate organs	3000	1600	30000
Relative ratio of antennal surface	2	1	3
<b><u>Glandular</u></b>			
Hypopharyngeal	Present	Absent	Absent
Mandibular	Large	Very large	Small
Head salivary (labial)	Large	Large	Absent
Wax glands	Present	Absent	Absent
Nasonov (concerned with direction finding)	Present	Absent	Absent
Dufour (concerned with defense)	Reduced	Large	Absent
Koshevnikov (scent-secreting gland)	Reduced or absent	Present	Absent
<b><u>Reproductive and sting</u></b>			
Ovary or testis	Reduced ovaries	Enlarged ovaries	Testis
Number of ovarioles	2 to 12	150 to 180	None
Spermatheca	Not developed	Large	None
Sting barbs	Strong	Minute	No sting
Sting plates	Loosely attached	Strongly attached	None
<b><u>Mouthpart</u></b>			
Mandibles	Slender	Robust	Small
Mandibular groove	Present	Absent	Absent
Proboscis	Long	Short	Short
<b><u>Leg and wing</u></b>			
Pollen press and comb	Present	Absent	Absent
Pollen basket	Present	Absent	Absent
Wing sensilla	Medium	Fewest	Most

## The Queen's First Days

Following her larval stage, the queen goes through the pupal phase, just like all other bees, and emerges as an adult queen 16 days after the egg phase. In size, she is rather larger than the workers, and rather longer than the male drones.

To help ensure the security of the hive, and bearing all potential circumstances in mind, the workers raise several queens at a time, not just one. In the event that any harm befalls the old queen, a new queen immediately begins to be raised. The first thing she does is to move around the combs until she finds an uncovered cell with honey in it. She eats the honey she finds and rapidly moves around the other combs. Her objective is to find and kill the other pupating, potential queens. As soon as she finds another unhatched queen, she uses her lower jaw to tear open the cell in which the queen pupa lies, and stings her rival. Alternatively, she may simply leave the cell cap open and leave the queen to be destroyed by the workers.

If the queen encounters another adult queen in the hive, the two attack each other in a fight to the death, which contest is decided when one manages to sting the other. But this is not a frequent occurrence in the hive, because queens confront one another only if the existing queen is very old or has not yet left the colony to establish a new



As soon as the queen bee emerges from the cell, the first thing she does is to destroy the other queen in the hive. These photos show queens fighting to the death.

one.<sup>47</sup> Generally speaking, when a new queen appears in the hive, the old queen has long since departed it. That the queen is so determined to kill her rivals is of great importance in terms of the order in the hive, because the existence of only one queen in the hive is essential for the establishment of discipline.

As she emerges from her cell, the new queen cannot replace the old queen, because she has not yet begun to lay eggs. In order to do so, she first needs to mate. Yet mating never takes place inside the hive. The queen soon leaves the hive and looks for male bees—drones—to fertilize her.<sup>48</sup>

There are two circumstances under which the queen leaves the hive: her mating flight and swarming time. Apart from these two occasions, the queen will never leave the hive. Before departing on the mating flight, she constantly moves around the hive. On days 5 and 6, she visits the hive entrance frequently. The following day or the day after, she leaves on short flights to learn the location of the hive and to familiarize herself with its surroundings. These flights start out with short duration, but become longer as the days go by.<sup>49</sup>

### **The Queen's Mating Flight**

The queen flies off from the hive to mate, accompanied by a group of workers. Shortly afterward, she leaves her escort of bees and flies alone to where male drones are present. When she comes within a certain distance of that area she starts to release a pheromone which allows the drones to locate her.

This journey, known as the mating flight and as a result of which the males become aware of her presence, typically takes place 10 days after the queen emerges from the pupa.<sup>50</sup> The queen's reproductive organs consist of two ovaries which produce her eggs, and a small receptacle at her abdomen known as the "spermatheca," in which the male's sperm is stored. This receptacle will play a most crucial role in the lives of bees that constitute the future members of the colony. The mating of the drone and



**Male bees (drones) waiting for the queen to leave on the mating flight**

queen takes place on the wing. Following fertilization, the male generally dies as the queen bee flies back to the hive.

It has been established that the queen makes from three to 12 flights during her mating period, mating with a different drone each time. Since the sperm from one male is insufficient to fill her spermatheca, she receives sperm from several males.<sup>51</sup> Following each fertilization, the sperm from all the males is stored together. The queen will use this sperm obtained from the mating flights during her life span of 4 to 5 years.<sup>52</sup> There is an average of 6 million spermatozoa in the spermatheca of a mated queen.<sup>53</sup>

Unlike the reproductive cells in many creatures, the male bees' sperm can be preserved for years in the queen's body without decaying or losing their viability. This is yet another sign of flawless creation in the body of the bee.

Yet the sperm collected in her body do not carry out the fertilization themselves. Every stage of the fertilization of the egg is under the queen's control. She regulates the fertilization by depositing as much sperm as she desires from the spermatheca. (This most miraculous process will be examined in greater detail later in this book.)

### **A Million Eggs a Year**

Some 2 to 3 days after the mating process is finished, the queen begins to lay her eggs one by one, in a series of cells specially prepared by the worker bees. She continues the process, non-stop, each year from early spring to mid-autumn, until the end of her life.

During the laying period, a queen lays from 1,500 to 2,000 eggs a day.<sup>54</sup> When necessary, she can increase that figure to as high as 3,000.<sup>55</sup> Based on

the queen's average speed, this means one fertilized egg laid every minute.

It has been calculated that a single queen may lay over one and a half million eggs within a year.<sup>56</sup> Given her normal life span, this means that a single queen will eventually lay millions of eggs. In addition, the total weight of the eggs laid by the queen during one day is equivalent to that of her own body!

When the queen is about to lay an egg, she first puts her head into the comb cell and inspects it. Having reassured herself that the cell is empty and suitable for having an egg laid in it, she projects her abdomen over it. She then lays a long egg carefully into the bottom of the cell. As soon as the process is over, she moves on to next empty cell. The queen repeats this at least 1,500 times in a day. Despite the tiring nature of the process, she displays the same care and attention every time she lays an egg.<sup>57</sup>



**The queen lays eggs  
in newly-cleaned  
cells.**

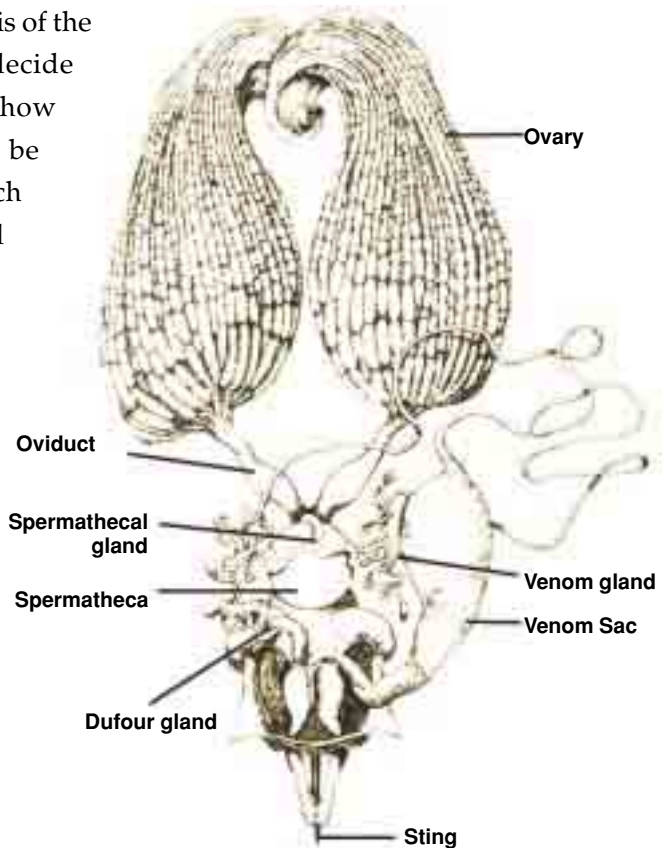
## **How the Queen Determines the Gender of the Other Bees**

We have already mentioned that the queen can determine the gender of the other bees yet unborn. She does this by opening and closing the mouth of the spermatheca in which the sperm are stored, and which is connected by a small duct to the oviduct—the tube through which the eggs pass from the ovary. When the queen wishes to lay a female egg, she releases a minute amount of sperm from the spermatheca into the duct, to fertilize the egg. The egg will be fertilized only if she releases sperm. If no sperm emerges from the spermatheca, the egg will remain unfertilized. As a result of this process, entirely under the queen's control, female bees emerge from the fertilized eggs and male bees, or drones, from the unfertilized ones.<sup>58</sup>

When scientists studied the question of how the queen bee can possess such a system and the criteria by which she determines gender, they arrived at very surprising results. Actually it's the worker bees who determine the gender of the egg, despite the queen's supervision of the process. That is because the queen lays an egg according to the kind of cell the workers have prepared for it. If the cell in which the queen is to lay an egg is a standard-size 5.2-millimeter (0.2-inch) female cell, then the queen performs fertilization and deposits in it an egg that will eventually hatch into a female bee. But if the queen comes across a larger 1-millimeter (0.03-inch) cell, then she lays an unfertilized egg in it. To put it another way, the queen lays as many drone eggs as the workers have prepared male bee cells for.<sup>59</sup>

The workers also determine the number of cells. On the basis of the needs of the hive, they decide how many worker and how many drone cells should be constructed, and how much space should be reserved for honey or pollen.<sup>60</sup>

**This drawing shows the reproductive system and sting of a mated queen. The queen bee's reproductive organs consist of two ovaries that produce her eggs, and a small receptacle known as the spermatheca, where the sperm from the drones which have mated with queen during her mating flight are stored.**





If, as we have seen, the workers decide on the number of cells in light of the needs of the hive, prepare the dimensions of those cells according to that number, and thus direct the queen's actions accordingly, a number of questions spring to mind: Is it possible for an insect to make minute calculations and decide on the cell size on its own? Or is it possible for any one insect to direct the actions of another? Of course not! Bees have very small brains, and entirely lack such attributes as thought, judgment or calculation. That being the case, it appears that there is another Power which controls the bees' behavior. The explanation for the worker bees' direction of the queen is both creatures' acting under the inspiration of God, Who teaches both groups of insects how to behave.

Let us now stop for a moment and consider that all the details we have examined so far demonstrate exceedingly conscious behavior, a flawless social order in the lives of bees, and the existence of features and structures fully compatible to carry out that order.

Quite obviously, no bee can identify the millimetric variations in the dimensions of the cells itself, nor decide accordingly on the gender of the egg. We therefore need to ask the following: Who determines the number of workers and males needed in the hive, and when a new queen will be needed? Do the intelligence and consciousness of the bees who build the combs establish this order? Or consider the queen, an insect only a few centimeters long and with a brain consisting of very basic nerve connections. With its own limited intelligence, how can such a creature possibly understand the purpose behind the comb cells constructed and lay the appropriate egg in each one with no confusion ever arising?

What emerges as a result of this is the existence of a flawless supervision of bees. Yet that control is not exerted by the queen bee or a few other bees over tens of thousands of workers. It is actually the inspiration of God. Like all other species, bees behave according to the inspiration of God and maintain the flawless order we have been considering so far. God has created their bodily systems to be ideally suited to the lives they are to lead. He is the Creator of all:

**Is He Who creates like him who does not create? So will you not pay heed? (Surat an-Nahl: 17)**

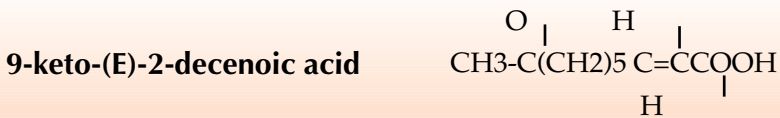
**[God is] the Originator of the heavens and Earth. When He decides on something, He just says to it, "Be!" and it is. (Surat al-Baqara: 117)**

### **The Queen's Authority Secretion**

Under normal conditions, the worker bees do not construct any cells for queens. The presence of the queen in the hive prevents this. Only in exceptional circumstances does this situation change. To understand the conditions under which the workers will begin to prepare a new royal cell when a queen is already present, we should examine the secretion emitted by the queen.

All of the worker bees in the hive are female, yet unlike the queen, they are unable to lay eggs since their reproductive organs are not developed. This was an interesting cause for speculation among scientists for many years. We have already seen how the female larvae emerge as either queens or workers due to how much royal jelly they are fed during the larval stage. In fact, the workers too have reproductive organs when they are first hatched. Yet these never develop and become suitable for egg-laying. Scientists researched the reasons for this and eventually found the answer they were looking for.

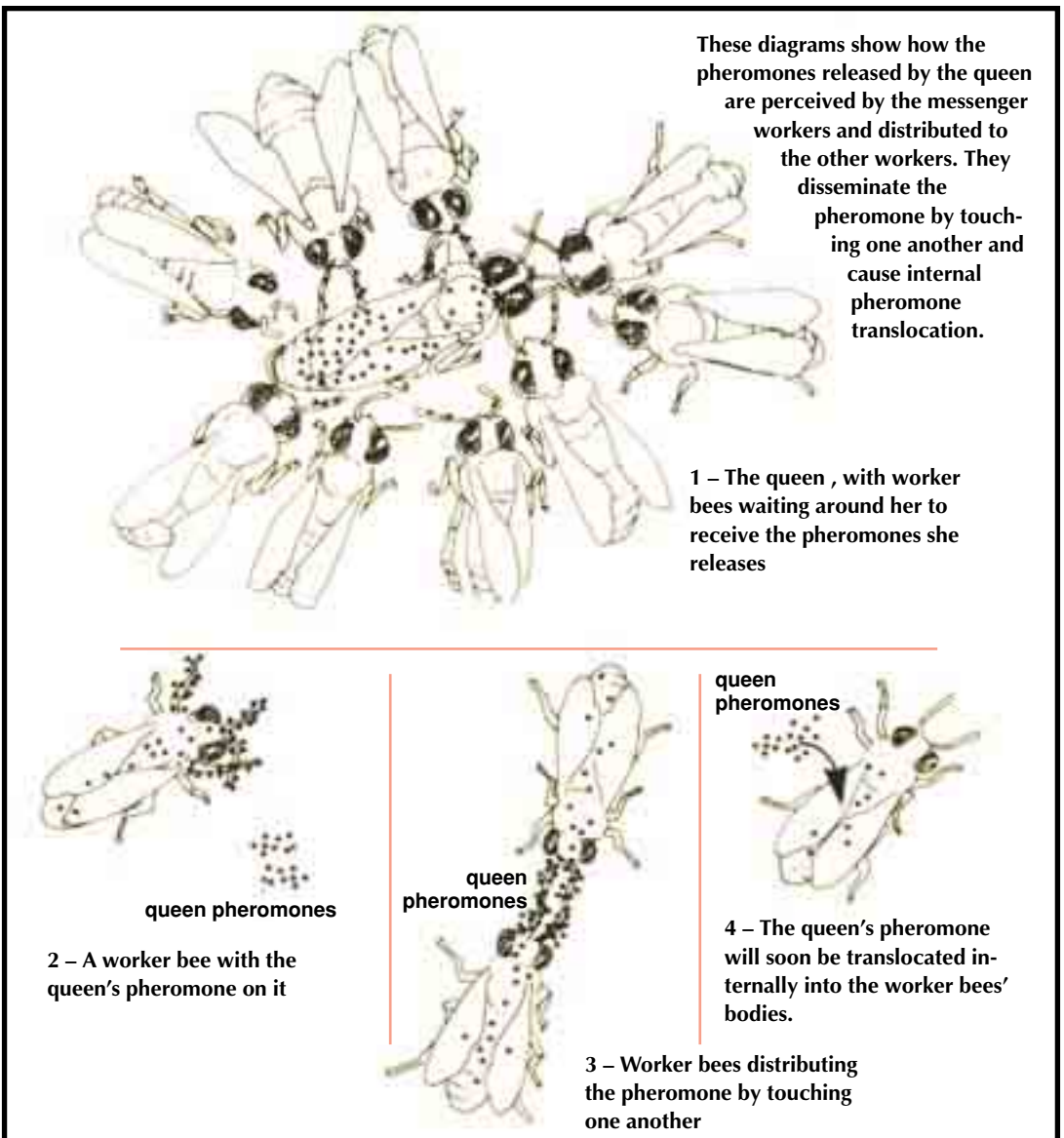
The answer lies in a chemical secreted by the queen, which chemical not only informs the other bees that she, the queen, is alive and well, but also sterilizes all the other females in the colony. This chemical from the queen's mandibular glands also allows members of the colony to recognize one another.<sup>61</sup> The formula of this chemical is:



The queen substance's formula (Thomas A. Sebeok, *Animal Communication*, p. 222.)

Another effect of this signal on the bees is it restrains them from constructing another royal cell for as long as the substance is present in the hive.

This substance also ensures discipline in the hive. Therefore, the queen needs to constantly produce enough of it in order for the hive to carry out all its everyday functions. This chemical released by the queen needs to reach all the bees in the hive, and the necessary level of queen substance



for each worker has been established as an average of  $0.1\mu\text{g}$  per day.<sup>62</sup> It is the queen who maintains order in the hive, though it's of course impossible for her to take a personal interest in all its tens of thousands of individual member bees.

The queen substance is constantly spread through the hive by up to a dozen bees that are always around her and care for her. These lick up the chemical from the queen's body and transmit it to the other

bees during food transfer, which takes place by mouth. During this process, the odor released by the queen is quickly transmitted to all other members of the colony. This means that all of the colony's members share a common odor, distinguishing them from members of other colonies.

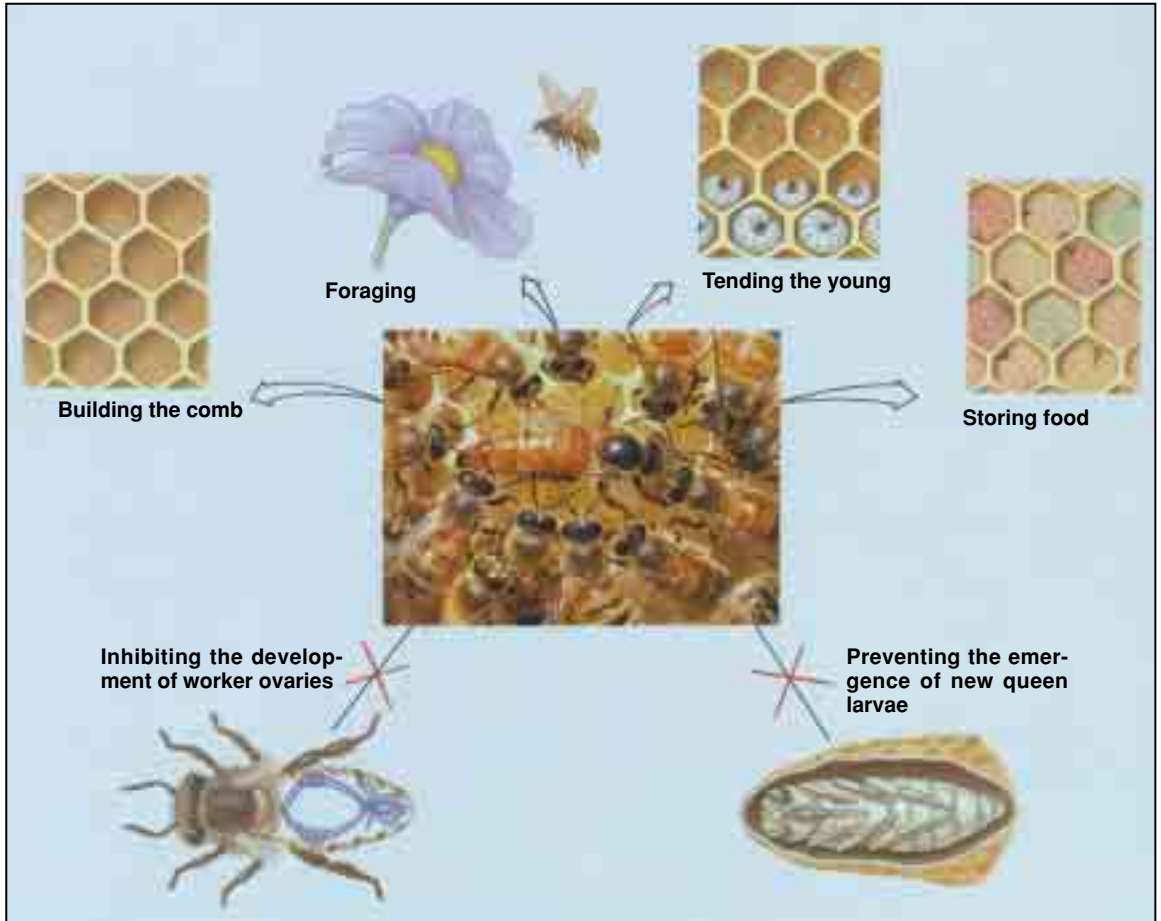
Any reduction in this secretion sets the workers into action, because they take it as a signal that that their queen has grown old, or that their colony has become excessively large. In either case, the workers need to take a number of measures.<sup>63</sup>

*Everything in the  
heavens and the  
earth glorifies God.  
He is the Almighty,  
the All-Wise.  
(Surat al-Hadid: 1)*

### **When the Queen Ages**

As the queen bee grows older, her strength declines, and the consequences begin to be seen in the hive. The rate of her egg-laying slows down, for instance, and most important of all, there is a drop in the quantity of the substance she secretes. As we have seen, the odor of this substance prevents the workers from raising a new queen, so such indications are a sign for the worker bees. As its level reduces, the workers immediately begin to construct new royal cells and set about raising new queens.

Under normal circumstances, it is out of the question for a bee colony to suddenly find itself without a queen. That's because when circumstances suddenly change and the colony finds itself facing the danger of having no queen, the worker bees immediately start feeding some of the



The upper section of this graphical representation shows part of the duties of the worker bees and, in the lower section, the effect of the queen bee on the workers.

existing larvae with royal jelly.<sup>64</sup>

There is another important point here. As already noted, the cells for those larvae raised as queens are generally wider than the others. Under emergency circumstances, there is no possibility of the larvae to be raised as queens being transferred to larger queen cells. Their cells are of the standard worker size, which might pose a problem for the developing queens. Yet for the bees, it represents no difficulty.

In such an emergency, the workers start to tear down the walls of cells around those of the larvae being raised as queens. Their aim is to widen the regular cells and enlarge them into royal cells. Several worker cells are torn down for any single royal cell. The worker larvae inside them die, of course.<sup>65</sup>

Yet this loss is insignificant for the hive. The workers do this in order to ensure the survival of their colony as a whole. They prefer the survival of a few candidate queens to that of several workers. Following the preparation of the queen cells in this manner, the new potential queens are fed with royal jelly.

Shortly afterwards, the first of the specially reared queens emerges from her cell and sets about eliminating her rivals.

From the moment she emerges from the cell until leaving the hive, the queen is fully aware of what she needs to do. There is only one possible explanation for her conscious and goal-oriented behavior and the way in which she's fully equipped with everything she needs to achieve that end. Bees possess a consciousness inspired in them by God, and engage in this behavior by His will.

## **Male Bees**

The males, or drones, are the only exception in bee colonies, where every other individual has a number of responsibilities. The male bees make no contribution to the defense of the hive, nor to cleaning, nor to food gathering. Their only function is to fertilize the queen.<sup>66</sup> Since the drones possess almost none of the features found in other bees, except for their reproductive organs, they are not able to serve any other purpose except fertilizing the queen.

There are very distinctive differences between male and female bees. Some of these may be listed as follows:

- Female bees have pollen baskets, whereas males do not.
- Females have stings, which are absent in males.
- Females have combs which help to collect pollen on their feet and



hairs on their abdomens—which males lack.

- Female bees have wax glands; males do not.
- Female bees construct combs, whereas males are unable to.
- Females can carry out the “bee dance,” but males cannot.
- Unlike males, females are able to collect food.
- Female bees nurse the young, unlike the males.

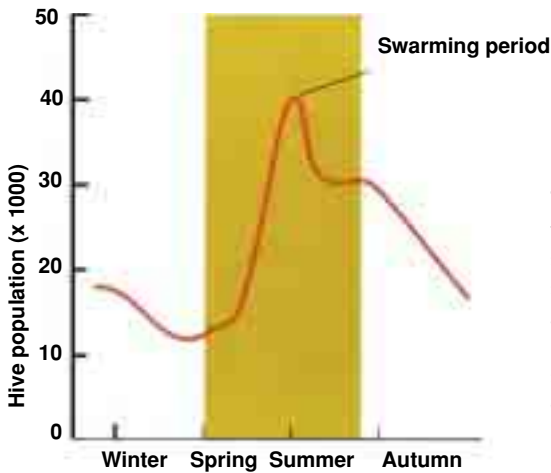
In winter, only female bees are to be found in the hive, because the males are either expelled from the hive or killed before winter’s arrival. As spring approaches, however, the worker bees begin to build cells for male eggs. The queen then lays in these cells eggs which will hatch into drones. The males emerge from these cells in early May.<sup>67</sup>

These months are generally when the old queen leaves the hive to establish a new colony and when new queens are raised in the hive. During this period, the new queen needs to engage in mating flights in order to be able to lay eggs, which is one of the reasons why the workers raise male bees.

Despite the male bees’ lack of abilities, the workers take great care of them until they mate with the queen. Five or six workers need to work non-stop to feed just one of the 400 to 500 male bees in the hive. In other words, some 2,000 to 3,000 worker bees do nothing else than care for the drones for a specific period of time.

No more than 10 males are necessary for the queen to mate. Nevertheless, a bee community raises hundreds of drones. Despite all the work that must be done in the hive, the workers spend a large part of their time taking care of the males. This task is most important because the queen has to find males when she departs on her mating flight. Bearing in mind the fact that bees have enemies such as dragonflies, and that the drones have no sting or venom to defend themselves with, one can more clearly see the importance of their being raised in large numbers.

Despite their serving no other purpose at all, the way that the drones receive enormous care from the workers for a specific period is an important precaution, taken for the security of the entire hive. There is of course a special purpose behind this—ensuring the continuity of the hive by



The population of the hive falls slightly in winter, but starts to rise again before spring since new workers are being raised. This population rise continues until swarming. (James and Carol Gould, *The Honey Bee*, p. 27.)

avoiding any risk to the mating of the queen. The question therefore arises: How do the bees take such an important decision? Did they all assemble together to work out this strategy? Or did they, by chance, discover that it was a good strategy and somehow understand that it was necessary and decide to continue with it?

Bees cannot of course do any of this and make such decisions of their own accord. They have no decision-making mechanisms, nor the consciousness with which to outline a strategy and then put it into action. Like all other living things on Earth, they are fully submitted to God.

Were the number of male bees to be limited, then a number of problems might arise during the fertilization process. For example, some of them might fail to find the queen, or else fall prey to their many predators. That might lead to the queen's spermatheca not being filled sufficiently, and thus to the eventual production of an insufficient number of bees in the hive. Yet no such thing ever actually happens. There are sufficient males in every hive. The workers conform to God's inspiration and look after the drones, who wander around the hive until the end of the mating period and do no work.



## The Special Characteristics of the Drones, Mating and Afterwards

The male bees leave the hive and start looking for the queen some two weeks after they emerge from their cells. During the males' mating period, a new function of the substance given off by the queen emerges: Thanks to it, the males can locate the queen during her mating flight.

As if to compensate, the bodies of the males possess a number of anatomical features superior to those of the hive's female workers and the queen. For example, the drones' compound eyes have a larger number of facets (from 8,000 to 10,000) than those of the females. There are about 2,600 smelling pores on the males' antennae.<sup>68</sup> Their wings are also more powerful than those of the workers.

Careful inspection shows that the males, with their very different features to those of the females, are created for a specific end—that is, for them to locate the queen with little difficulty. The males need to be able to fly at a height for long periods while searching for the queen and to be able to locate her fragrance from a long distance away. Therefore the males possess these attributes, which are very different from those of the other bees in the hive.

The fact that every living thing possesses the features necessary for it is just one of the indications of the flawless order in the universe. Such an order absolutely cannot have come about by chance. It is God Who creates all living things, together with the characteristics essential to them. This order that prevails throughout the entire universe is just one of the proofs of God's limitless creative artistry.

*Is it other than the religion of God that you desire, when everything in the heavens and earth, willingly or unwillingly, submits to Him and to Him you will be returned? (Surah Al 'Imran: 83)*

### **The Male Bees' Inevitable End**

The queen and the male generally meet at high altitudes. The males are unable to approach the queen at lower than 4.5 meters (14.76 feet). During mating, part of the males' reproductive organs, including the sperm sac, ruptures, and as soon as mating is completed, the male bee dies.<sup>69</sup> Neither do the other males who fail to mate with the queen have much longer to live. Males live only in spring and early summer, after which they are killed by the workers. Once the time of the mating flight is over—and as the nectar levels in flowers start to decline in the heat of summer—the workers' behavior towards the males changes completely. Although the workers look after the males very carefully during the mating period, once that period is over, they start to tear off the drones' wings and attack them. If the males try to eat anything, the workers seize them in their powerful mouths and drag them by their antennae or legs to the hive entrance and throw them out.

Expelled in this way, the males soon die of hunger, since they lack the ability to find food for themselves. Therefore, they make determined efforts to re-enter the hive. Yet again they face the bites and poisoned stings of the workers. Although the drones are larger than the workers, they are unable to withstand this attack.<sup>70</sup> Following the expulsion of the males from the hive, the females—both workers and the queen—spend a long time in the hive, until spring the following year, on their own.

Now, consider the situation of the male bees in the light of evolutionist claims. As just described, the males die shortly after their mating. This is one form of behavior that evolutionists cannot explain. The way that the drone risks death and embarks on the mating flight for the hive's benefit is behavior totally at odds with the concept of the "struggle for survival." If the mechanisms that evolution claims to exist in nature really did so, then the males should long since have undergone an evolutionary process that worked more in their favor. Yet for millions of years, male bees have been embarking on mating flights that will lead to their deaths.

In short, it is impossible to account for this example of self-sacrifice



**The male bees, whose only job is to fertilize the queen, are expelled from the hive by the worker bees as soon as they complete that task.**

among bees by means of any claims from the theory of evolution. There can be only one explanation for a living thing ignoring its own safety and seeking to ensure the security and well-beings of other, unborn members of its own group: The order established in the beehive has been set out by a Creator possessed of a most superior intellect, one Who has given very different tasks to every bee within the hive. Bees living in any hive behave in accordance with those tasks entrusted to them, and sacrifice their lives if necessary for their sake. The important thing is continuity of the group order, and the necessary self-sacrifice for this occurs not by the will of the bees—who lack any conscious judgment—but through the will of Him Who rules them. In other words, the drones embark on their mating flight in obedience to the command of God Who created them, and ensure the continued existence of the hive at the cost of their own lives.

## Population Planning in the Hive

Thanks to the special organization within the hive, the thousands of female bees in it occupy themselves with work inside and outside the hive, rather than looking after the drones, who serve no purpose, all through the winter. It is essential that the hive get through the winter. More individual bees would necessitate a larger stock of food, for which more honeycombs would need to be produced and therefore, a greater communal effort made. Moreover, the drones are larger than the females and taking care of them is even harder work.

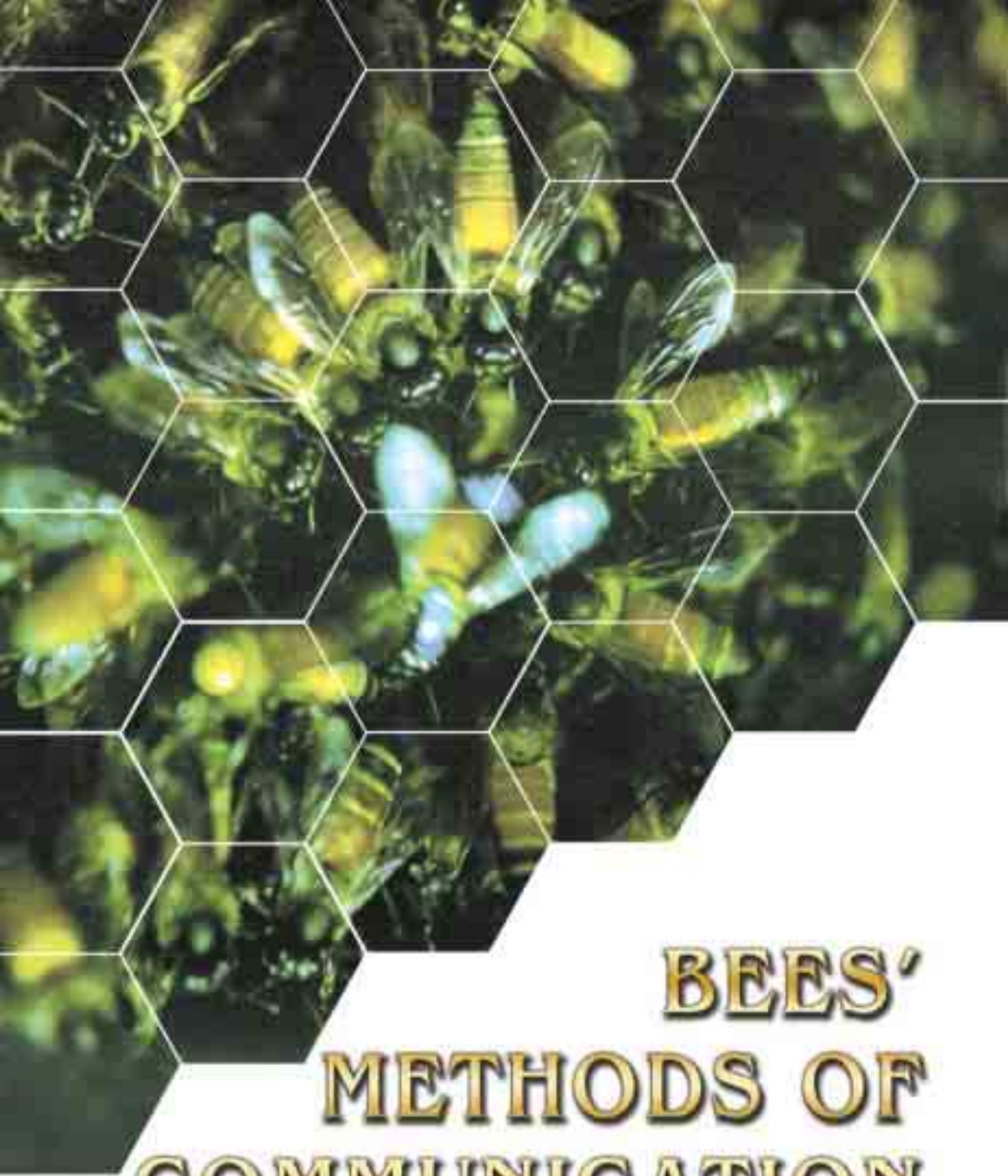
When necessary, if their food stocks are insufficient, the bees do not stop at killing off all the males. They can also destroy the eggs and larvae to reduce the numbers in the colony.

As the bees carry out their population planning in the hive they can gradually, and in a controlled manner, eliminate new individuals at the larval and pupal stages. It has been observed that this method reduces the population by one-fifth.<sup>71</sup>

As this account has shown so far, there is a flawless control and order in the lives of bees. This order in the hive, capable of responding to all the bees' needs, is a sign that they were created by God. God creates all living things with the greatest wisdom. The task of intelligent people is to consider these living creatures and draw the obvious conclusions.

*Among His signs is the creation of the heavens and earth and all the creatures He has spread about in them. And He has the power to gather them together whenever He wills. (Surat ash-Shura: 29)*





# BEES' METHODS OF COMMUNICATION

*Exalted be God, the King, the Real. There is no deity but Him, Lord of the Noble Throne. (Surat al-Muminun: 116)*

**S**cientists have performed a great deal of research to determine how the order is maintained in the hive, in which tens of thousands of bees live. A large number of academic studies have been carried out to that end as well. One prominent expert and professor at the University of Munich, the Australian zoologist Karl von Frisch, has devoted an entire 350-page book to bee communication, *The Dance Language and Orientation of Bees*.



### How Do Bees Communicate?

To find food, bees must usually search wide areas and fly long distances. When a bee finds a new source of food, it immediately returns to the hive to inform the other members of the colony. Shortly afterwards, other bees begin flying around the source.

Bees are deaf, and cannot therefore establish communications by means of sound.<sup>72</sup> Nevertheless, they are able to communicate the location of a food source to the other members of the colony with no difficulty. The methods they employ are quite extraordinary.

Scientists studying how bees inform each other of the places they find made a most astonishing discovery. Bees “describe” the location of a distant place by dancing. All the information that other bees need to find the food source—its distance from the hive, its direction, productivity—is encoded in this dance.

Once it locates a new food source, the bee returns to the hive and starts repeating specific movements in such a way as to attract the other bees’ attention. All the information they need about the food source can be obtained from the bee’s general behavior. For instance, if a bee simply returns to the hive, deposits its load of collected pollen and flies off again, this means that the source that the bee used is either already known or else not very productive. At times when water is scarce, they’ll also use this dance to describe the location of water.<sup>73</sup>

## The Bee Dance

The bee dance takes two distinct forms, depending on the distance of the food source.

The form known as the “round dance,” encountered most frequently, doesn’t bother to indicate the food source’s distance and direction. It does, however, tell the workers that the source is closer than 15 meters (50 feet) from the nest. Having located a food source, the bee first gives nectar to the workers in the nest, and then begins her dance, repeatedly making small circles. The other bees then gather around the dancer. She reverses direction and turns around the other way every one or two revolutions, or even more often. This dance, which can last for a few seconds or up to minutes, consists of up to 20 reversals and is followed by another exchange of nectar between the dancer and the bees in the nest.

Eventually the dance comes to an end. The dancing bee flies off to look for another source of food. In one experiment, Karl von Frisch showed that of the 174 bees who made contact with the dancing bee, 155 found the food source within five minutes.<sup>74</sup>

The bees perform their dances on the vertical comb, in the darkness of the hive—most important in helping us better understand bees’ flawless abilities to communicate. In the pitch dark, bees give the other workers around them all the information they could possibly need about the food source. Although their movements on the combs are performed in darkness, they are still correctly perceived by their fellows and immediately followed up.

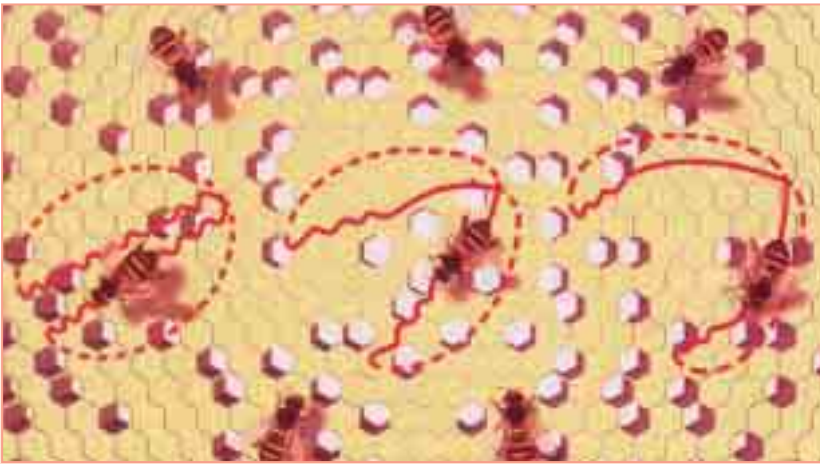
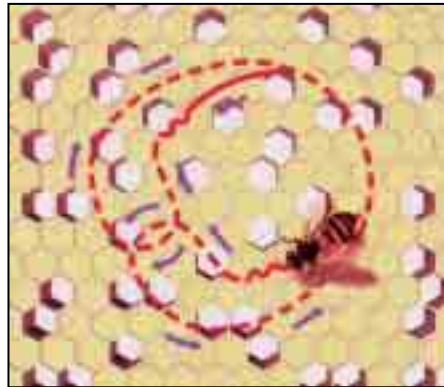
In the same way that bees perform a round dance for food sources within 15



**Karl von Frisch has spent his entire life studying bees and won a Nobel Prize for his research on that subject.**



When bees return from a food source, they dance on the comb. To the side can be seen a bee performing the dance when the food source is nearby. The bee makes two semi-circular lines, then returns to the starting point.



The drawing above shows with wavy lines the figure-eight dance bees perform to provide information about the distance of the food source.

meters of the hive, they perform “transition” dances for sources from 25 to 100 meters (80 to 330 feet) away. They use the “waggle” dance, what’s also known as the “figure-eight dance,” to notify other bees of the distance, direction and quality of food sources further than 100 meters (330 feet) from their hive.

When the bees return to the hive from the food source, they perform this dance on top of the honeycombs. As the workers take their steps, they also shake their abdomens. The form of this characteristic movement closely resembles a figure-eight. In a typical dance, the bee moves in a straight line for a short distance, moving its body from side to side ap-



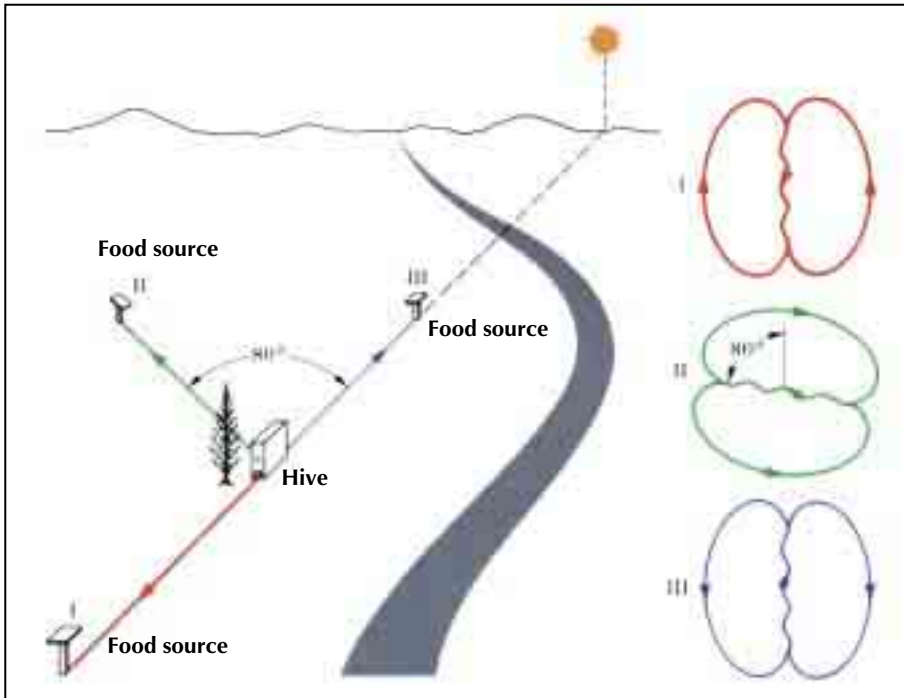
**The sickle-shaped transition dance performed by very different species of bee**

proximately 13 to 15 times a second.

By varying the angle between the wagging run and an imaginary line running straight up and down, the bee conveys the direction of the food source. If a line is drawn which connects the food source and the hive, and another line which connects the hive and the spot on the horizon immediately below the sun, then the angle formed by the two is observed to be the same as that of the angle in the waggle dance. Just like civil engineers, the bees are able to triangulate.<sup>75</sup>

Throughout the oscillatory movement in the waggle dance, the bee's abdomen is the most important organ. A buzzing sound is given off thanks to vibrations from the muscles and exoskeleton. At the end of each straight line, the bee turns in one direction and makes a semi-circular return to her starting point. She then moves forward again in a straight line, making a semi-circular return in the exact opposite direction. As with the round dance, the waggle dance ends with the dancer stopping and distributing food from its honey stomach to the workers around it. The bees watching the dance may sometimes produce a sound lasting from a tenth to two-tenths of a second. This causes the dancer to stop and exchange food with the buzzing bees. Both nectar and pollen gatherers dance in the same way.

The bees watching this dance are easily able to locate the food source. One feature that establishes distance is the dance tempo, measured by the number of turns every 15 seconds, and the duration of wagging and buzzing on every straight line. For more distant food sources, the dance tempo slows and speeds up for closer ones. The time spent in the straight



1- If the food source lies exactly in the direction of the Sun, or in the exact opposite direction, the wagging runs in the dance will be vertical on the comb. 2- If the food source is 80 degrees to the left of the Sun, this is indicated by doing the wagging run part of the dance at a corresponding angle of 80 degrees to the left of the vertical. 3- If the bee follows an upward direction in its wagging run, it signals that the food source lies in the direction toward the Sun. And if it heads straight downwards, this means that the source lies in the exact opposite direction from the Sun.

run increases for more distant sources.<sup>76</sup>

Throughout the dance, the other bees crowd around the one “dancing this description” and follow its every move. They also touch its wagging abdomen with their antennae. This movement is most important, because they perceive the vibrations produced by the dancer and thus establish the

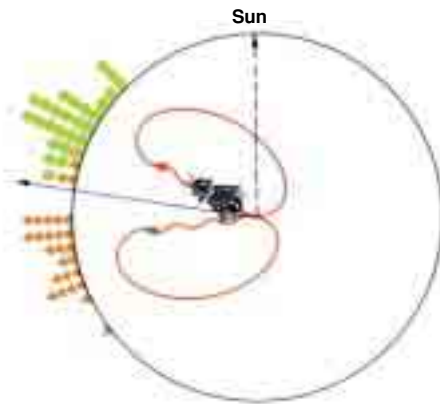


Bees watch the dancing bee in their midst, then find the food source by following the directions given.

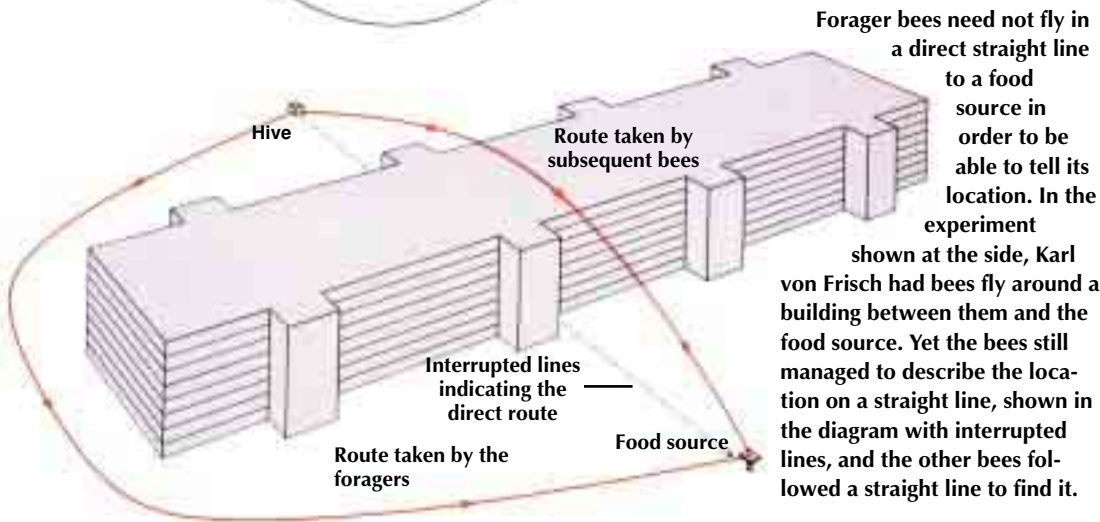
distance of the food source.<sup>77</sup> In order to describe a distance of 250 meters (820 feet), for instance, the bee will shake its abdomen 5 times in 30 seconds. It has been observed that by means of these dances, bees are able to inform one another of food sources at distances of up to 9 to 10 kilometers (5 to 6 miles).

For bees, another essential piece of information is the quality of the food at the source. This they obtain thanks to the scent that has settled on the bee performing the dance.

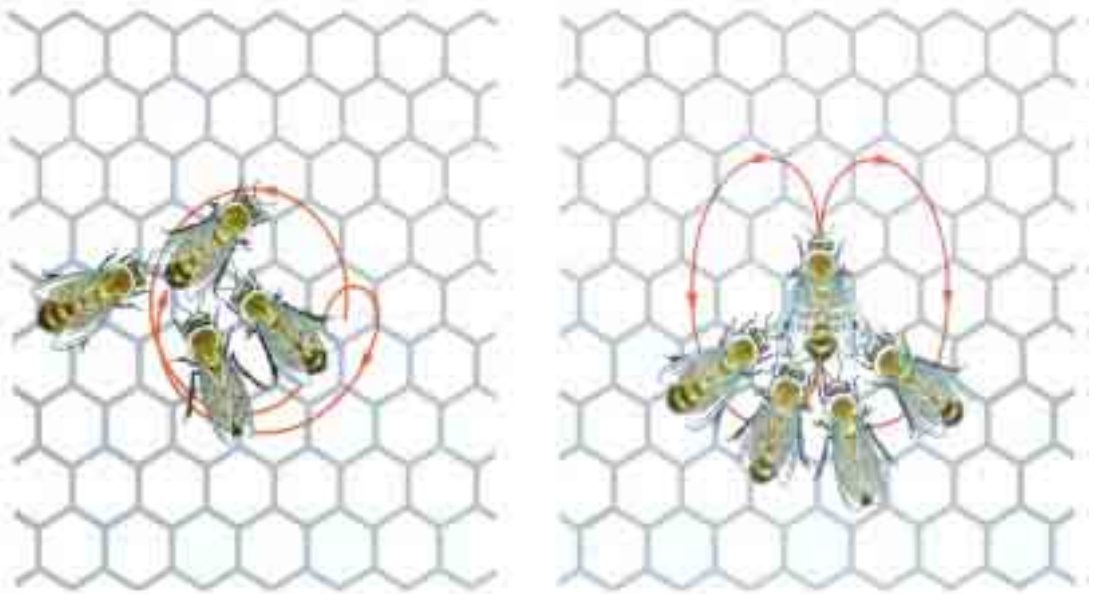
In the light of the information thus communicated, it is an easy matter for the other bees to find the food source. The number of bees that gather at the source is directly proportionate to the number of bees performing the dance. If a single bee performs it, the whole hive does not go into ac-



No two figure-eight dances are the same. To the side can be seen the direction of the great many dances performed when the food source is 80 degrees to the left of the Sun. The triangles formed by the bees as they dance show the direction of the clockwise dances, and the circles, that of the counter-clockwise dances.



Forager bees need not fly in a direct straight line to a food source in order to be able to tell its location. In the experiment shown at the side, Karl von Frisch had bees fly around a building between them and the food source. Yet the bees still managed to describe the location on a straight line, shown in the diagram with interrupted lines, and the other bees followed a straight line to find it.

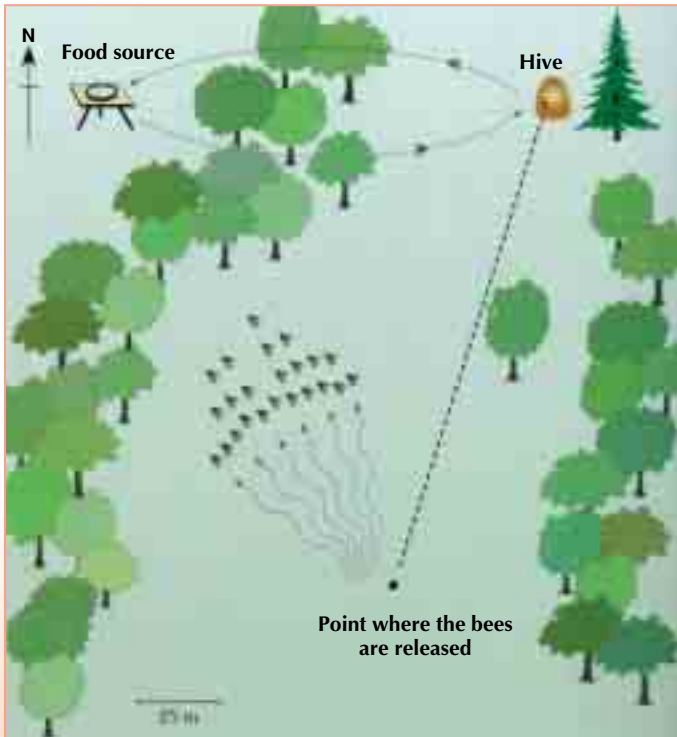


**If the food source they find is very rich, the dance the bees perform is very enthusiastic. If the source is nearby, they describe its location by performing the “round dance” shown on the left. For food sources that are further away, they perform the figure-eight dance seen on the right, with wagging movements.**

tion. First, a group of scouts leaves the hive. If that group also performs the dance on their return, then more bees head towards the target. The better the food source they find, the longer they dance and the more bees follow them. In this way the food gatherers’ attention is always focused on the most productive source.

In the event that the food source found is unproductive, the bees still dance—but they do so unwillingly, and for a shorter time. This is also reflected to the other bees in the hive, and those bees that gathered around the dancer soon disperse, and a new team leaves the hive in search of food.

Consider that the honeybees that perform the dance are just a few centimeters long, the same insects you encounter when you go outside, walk in your garden or sits out on a balcony. There’s an interesting contradiction here. People regard honeybees as ordinary, familiar insects, yet the phenomena we have seen so far can only be carried out with a very defi-



An experiment was performed to show that bees make use of surface shapes to recognize their surroundings. First, bees were introduced to the food source shown in the top left-hand corner. Then as soon as they left the hive for the source indicated, they were caught, brought to the point at bottom right, and released there. Even though the food source was not directly visible, the bees were able to head in the right direction, toward the food source.

nite consciousness. Were you to ask human beings to give the same directions that the bee does by dancing, they would be nowhere near as successful. That's because although human beings possess reason and consciousness, they lack the ability to perform such minute calculations without technical measuring equipment.

So who teaches bees this conscious behavior? They cannot learn it from other bees, and there is no training period in their brief lives. They come into the world already possessed of this knowledge, able to act upon it when the time comes. That applies to all the bees on Earth, who have been living on it for tens of millions of years.

We therefore find ourselves facing a major truth that no person of good conscience can possibly deny: God, the Creator of all living things, has flawlessly created honeybees and taught them such conscious behavior. As revealed in Surat an-Nahl, they act in accordance with the inspiration of our Lord.

To fully comprehend the significance of the description that bees make

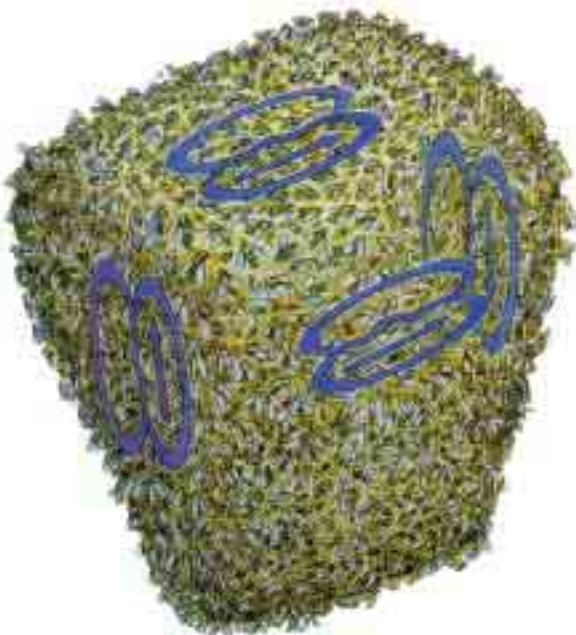
by dancing, we need to consider their movements in the hive and their overall environment. In her book *Through Our Eyes Only?: The Search for Animal Consciousness*, the evolutionist author Marian Stamp Dawkins discusses how the bees give these directions:

The problem the bees have is that they often dance on the inside of a dark hive where neither the food itself nor the sun is visible. Not only that, but they are dancing on a vertical comb when information has to be given to the other bees about which direction they should fly in the horizontal plane.<sup>78</sup>

Although the bees giving the directions dance on a vertical surface, the bees going out to seek the food source will operate in a horizontal plane. In other words, the information about which direction they must take should actually be expressed in a horizontal plane. If the bees were to act according to directions given in a vertical plane, then they would fly straight upwards, and it would be totally impossible for them to find any food.

In her book, Dawkins continues:

The bees cannot, therefore, indicate the direction of food by simply pointing or dancing towards it. They translate the flight path from hive to food (which will



One species of honeybee, known as the dwarf honeybee, always constructs its hives in the open. When they find a food source, they generally dance on top of the nest covered with bees (left). These bees perform the figure-eight dance to point to the food source directly. If for any reason they dance on the sides or rear of the hive, they redirect their dances again to indicate the direction of the source.

eventually be taken relative to the sun) into a direction relative to gravity inside the hive and the other bees retranslate this back into instructions relative to the sun when they get outside. So if the food is to be found by flying directly into the sun, the dancer will dance so that she does the straight “waggle” run precisely vertically on the comb, whereas if the food is to be found by flying at an angle of 40 degrees to the west of the sun, she waggles 40 degrees to the left of straight vertical. She thus substitutes angle with respect to vertical for angle with respect to the sun and conveys, in the darkness of the hive, information to her companions as to the direction they should fly when they get out into the sunlight.<sup>79</sup>

Consider: Bees fully understand the directions, even those are given in the dark and in a different plane, and always head straight towards their target. The movements made with respect to a vertical line established by the dancing bee are fully understood by the others, which are capable of calculating angles.

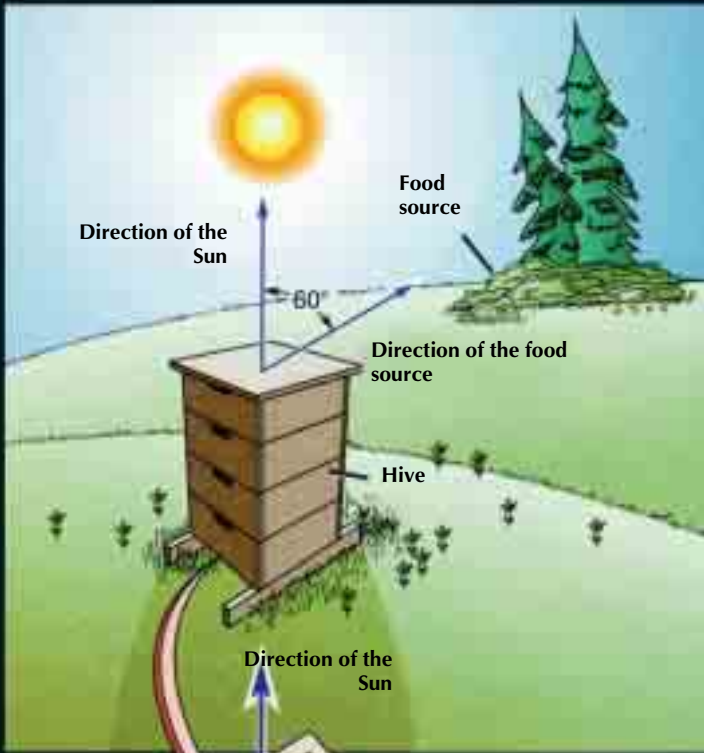
In light of this, Dawkins expresses her thoughts in these terms:

The fact that they do this [calculating angles] correctly shows that bees do indeed convey information to each other.<sup>80</sup>

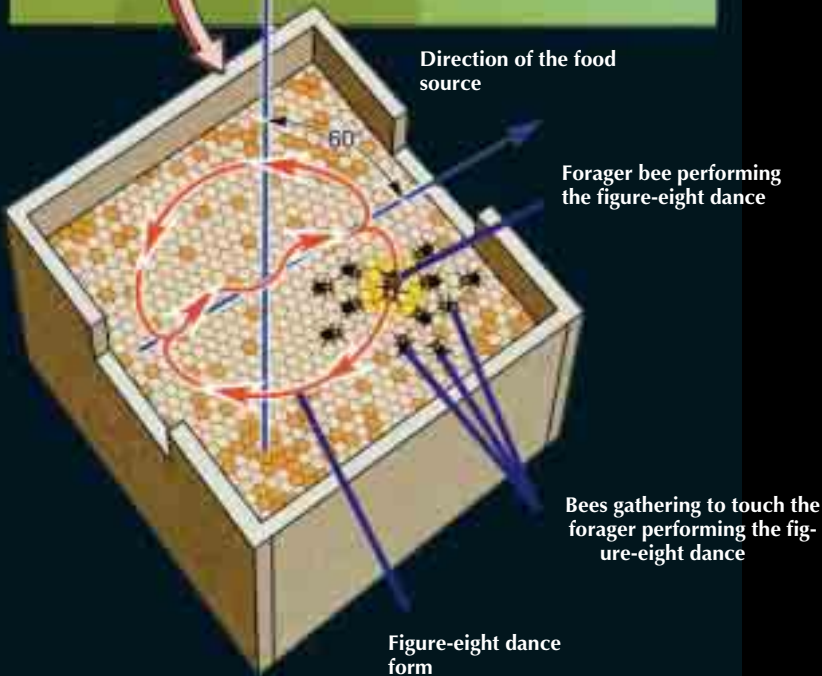
In short, all honeybees are able to calculate angles. Dawkins interprets this as bees conveying information to each other. However, there are important questions that require an answer. How did bees discover this method of calculation? Is it possible for the bee, simply by looking at the Sun, to distinguish between vertical and horizontal, to add the angle to the direction it gives, and always to do so accurately? How did other bees gain the ability to interpret this? How did they first learn to use the Sun as a reference?

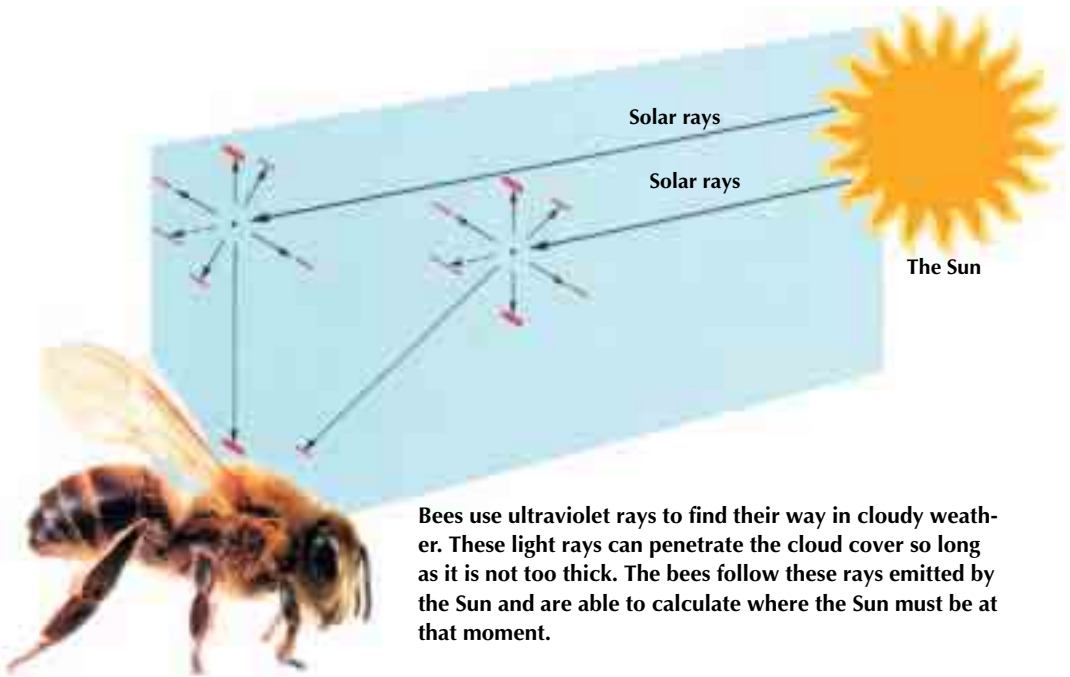
Obviously, bees cannot calculate planes and angles and other such mathematical functions on their own. There is only one explanation for all these complex abilities in bees. Bees are directed by a superior power, which belongs to God, Ruler of all the universe, Who gives bees all their sophisticated attributes.





Bees describe the location of the food source on the comb's vertical plane. Yet as the picture to the side shows, the destination lies on the horizontal plane. Nonetheless, the bees fully understand the directions given and reach the source by calculating the necessary angles. The inspiration of God is the source of this astonishing ability.





Bees use ultraviolet rays to find their way in cloudy weather. These light rays can penetrate the cloud cover so long as it is not too thick. The bees follow these rays emitted by the Sun and are able to calculate where the Sun must be at that moment.

## How Do Bees Find Their Way in Cloudy Weather?

As bees fly towards their food source, they observe the Sun. This is essential if the scout bees are to make use of the angle and direction indicated in the dance.

Yet bees are not limited to this remarkable achievement, and engage in activities even more extraordinary. Even if the weather is cloudy, they can use the Sun by means of its ultraviolet rays, which are able to pass through cloud cover as long as it is not too thick. The worker bees use these rays to establish the location of the Sun. The natural light from the Sun is polarized, in other words, the direction of vibrations of the light waves changes regularly as the Sun moves in the sky. This polarization cannot be seen by the human eye, although bees and many other living things can perceive it. Cloudy weather that makes the Sun invisible represents no obstacle to these creatures. Despite the clouds, bees think of the sky as being parceled up, and calculate where the Sun should be at a given moment.<sup>81</sup> No doubt, this attribute is one of the examples of God's superior creation that enables bees to survive.

## BEES' MEMORIES

It has been established that after watching the dance of a forager, the other bees in the hive do not immediately set off in flight. First they analyze the information provided in the dance and decide whether to act upon it.

In one experiment, a small boat was anchored in the middle of a lake near a hive, and food was placed in it. The bees eventually discovered this food, immediately returned to the hive and danced to tell their fellows of the direction and location of the food source. But even though they danced for a long while, the other bees disregarded their information and re-

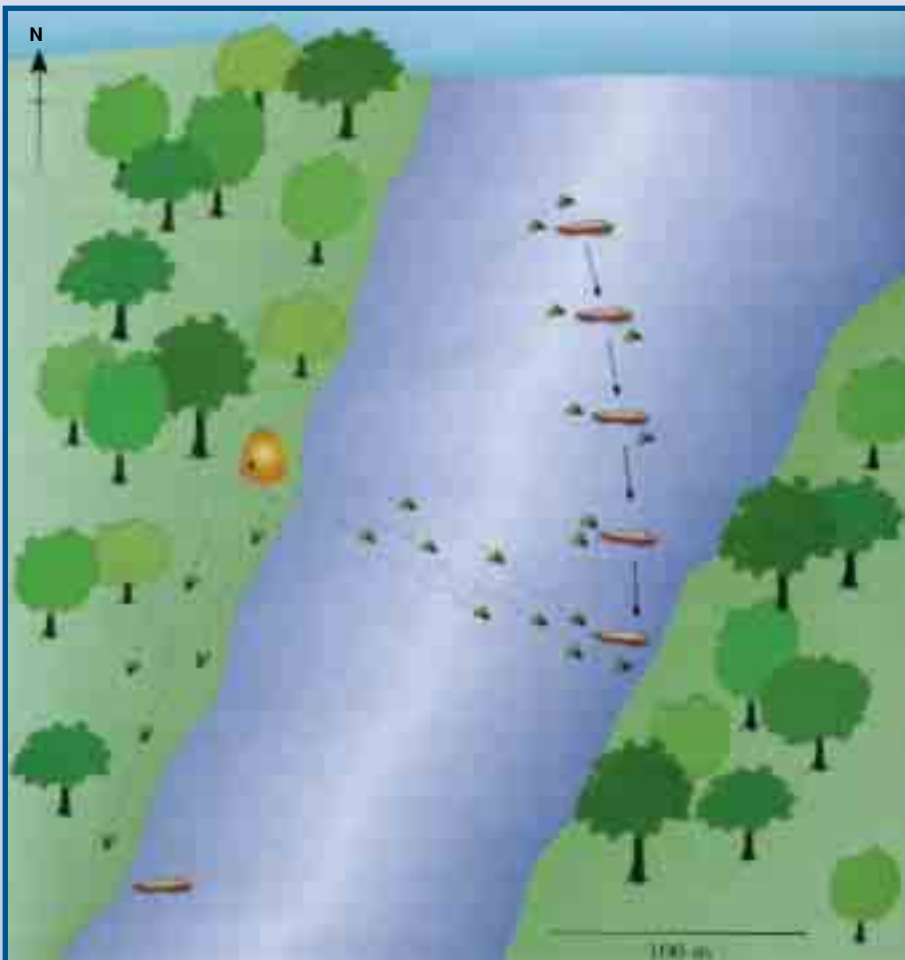
mained in the hive.

The boat was then pulled to the shore. A number of bees again found it, returned to the hive and began dancing. This time, the other bees left the hive and headed for the boat.

From this, the scientists concluded that bees were aware of their surroundings and knew there was a lake there. Since there could be no food source for them in the lake, they ignored the first bees' "mistaken" dance.

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James and Carol Gould, *The Animal Mind*,  
p. 106.



## The Directions Given by Bees are Totally Accurate

As stated earlier, shortly after watching the dancing bee, other workers leave the hive and head off for the target. However, bees also face an important problem: The angle that the dancer gave to her sisters is based on the Sun. Yet the Sun is not fixed in the sky, but changes position by 1 degree every 4 minutes. If a bee followed the original line, it would never be able to locate its target, due to the shift in the Sun's position. Every 4 minutes will bring a margin of error of 1 degree, which will reach uncorrectable dimensions over a long journey.

This presents no problem over short distances, say over 200 meters (650 feet). A bee flies at an average of 13 kilometers (8 miles) an hour, traveling 216 meters, or 708 feet a minute.<sup>82</sup>

But what if the target is more than 4 minutes away?

As already said, bees can collect food from an area 10-kilometers (6.2 miles) wide. They must fly for about 45 minutes to cover 10 kilometers.<sup>83</sup> During that time, however, the Sun will move some 11 degrees. If the bee follows the direction given by the original dancing bee, then it will be deflected from the food source as the Sun changes position. In returning to the hive, a bee that has traveled a distance of 10 kilometers bears in mind the position of the food source in relation to that of the Sun. Moreover, since this bee is carrying food, it must travel more slowly, at 9 kilometers/hour (5.6 miles/hour).<sup>84</sup> That means that during the bee's return, the Sun will have moved 16.5 degrees. Therefore, the bee's directions relative to the Sun may possibly be wrong. Add the 16.5-degree discrepancy of the bee performing the dance to the 11-degree margin of error of the bee setting out, and the bee may end up 27.5 degrees away from the food source.

*He to Whom the kingdom of the heavens and the earth belongs. He does not have a son and He has no partner in the Kingdom. He created everything and determined it most exactly. (Surat al-Furqan: 2)*

Moreover, if the bee fails to find any food source after traveling that distance, she will not have the strength to get back, because bees only take as much honey as they will use for that distance, in order to return with more food from their destination. When that honey is used up, their strength also evaporates. If they're unable to reach nectar, they'll be unable to return from a lack of energy.

Yet in reality, this never happens. For millions of years now, bees have been understanding the directions given to them by their sisters—despite the movement of the Sun and the changing angles. Bees experience no difficulties in finding sources of food, indicating that they make no mistakes in calculating the angle with respect to the Sun. To express this in mathematical terms, the bees calculate that the Sun moves 1 degree every 4 minutes. As a result, they're able to keep the food source's exact location in mind and to "describe" it to other bees. Other bees calculate the angle according to the changed position of the Sun, understand those directions given, and locate the food source in question.

A careful re-reading of the preceding paragraph will show the extraordinary nature of these directions given by bees. It will be useful to consider those words not with their usual familiarity, but one by one, imagining what is being described, and using our reason, logic and conscience. Very few people are even aware of exactly how much the position of the Sun changes in how many minutes. Yet bees, as if they were conscious of all this, perform a precisely accurate mathematical calculation, accurate to the minute and even to the second. Is it at all possible for a bee to perform, of its own volition, such a calculation, which even a human who's not an expert on the subject could not manage? Of course not! That ability has been given to bees by God. To claim otherwise would violate all the rules of reason and logic. Someone who maintains that bees learned such a calculation by themselves during some alleged "process of evolution" must also claim that in hundreds of years' time, again through that same process, bees will be able to solve equations better than even the best-skilled academics. No one could possibly make such a claim, and we would have grave doubts about the sanity of anyone who did.

## HOW BEES CALCULATE DISTANCE

Various experiments have been carried out regarding how bees, when they set off to look for food, take a small quantity of it with them. In one experiment, bees who found a bowl containing sugar water at a specific distance returned to the hive (1) and described its location. The first group of bees who set out brought food back from the source.

Then the scientists conducting the experiment placed the bowl slightly farther away. The second group to arrive were unable to find food at the location indicated, and were unable to return from a lack of energy (2). They

were able to find the strength to set out only by reinforcement with sugar water and honey (3-4). The reason why bees take only enough food to permit them to reach the source is so that they can carry more pollen and nectar on their return.

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Moody Science Classic, *City of the Bees*, Moody Video: A Ministry of Moody Bible Institute, 820 N. LaSalle Boulevard, Chicago, IL 60610-3284.



## How Did Bees Learn to Calculate?

As we have seen so far, bees calculate in various different ways and use the Sun in doing so. It is quite impossible for an insect to know about the movements of the Earth and Sun, to know the consequences, and act accordingly. It's out of the question for bees to be getting these calculations right every time by sheer chance. Nevertheless, all scientists who have researched the subject agree that bees have indeed been performing these calculations with complete accuracy for millions of years.

Unless someone has received the appropriate training, if he gets lost, he'll need some equipment such as a compass to find his way. It is almost impossible for him to find his way by calculating the exact position of the Sun. Yet despite the Sun being in constant motion, a bee can describe the site it's visited, in a flawlessly correct manner, to other bees in the hive.

How could these extraordinary abilities have come about? How did bees learn to perform these calculations?

First, bees must have possessed an ability to find their way and to give directions to other bees, ever since the moment they first appeared on Earth. This ability is essential if they are to meet their needs for food and shelter—and thus, for their very survival.

It is impossible for this ability to have developed over time by means of various changes, as evolutionists would have us believe. Indeed, scientists supporting the theory of evolution find themselves faced with the very difficult question of how bees' communication abilities came into existence. Richard Dawkins, one of the leading contemporary evolutionists, is clearly "bewildered" by the question of the evolution of the bee dance, but attempts to provide an answer in these faltering terms:

The suggestion is that . . . Perhaps the dance is a kind of . . . It is not difficult to imagine . . . Nobody knows why this happens, but it does . . . It probably provided the necessary . . . We have found a plausible series of graded intermediates by which the modern bee dance could have been evolved from simpler beginnings. The story as I have told it . . . may not be the right one. But something a bit like it surely did happen.<sup>85</sup>

As can be seen from Dawkins' faulty logic in reply to this question, it can only be fantasy to talk about the bee dance in terms of "chance" and "transition."

Making use of the Sun to calculate angles is an ability that cannot be acquired by chance. However, it's not enough for bees to learn to dance or to be able to calculate angles; they also need the other bees to be able to understand them. Bearing this in mind, you can see how totally nonsensical it would be to think in terms of "chance." No matter how long one might wait, it's quite impossible for any creature to form such a calculating ability of its own accord.

The bee is a creature with no capacity for thought. Nevertheless, as we have seen throughout, its every action reveals an incomparable intelligence and consciousness. As with every aspect of the universe, this intelligence and consciousness that manifest themselves in bees actually belong to God, the flawless Creator of all.



### The Bees' Eye

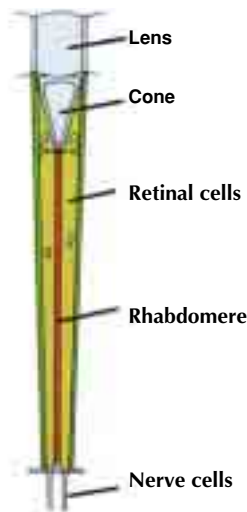
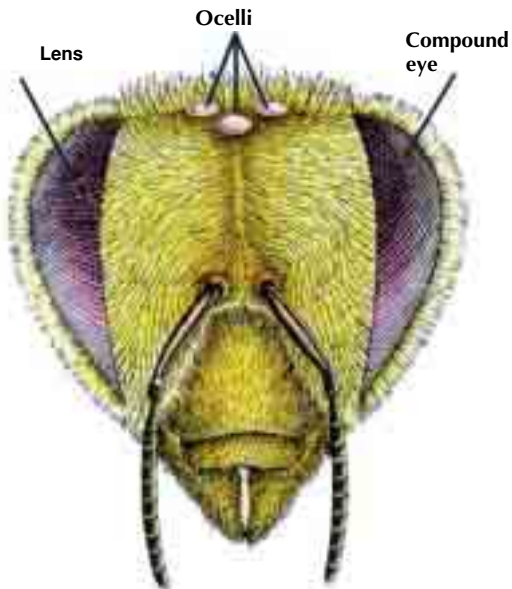
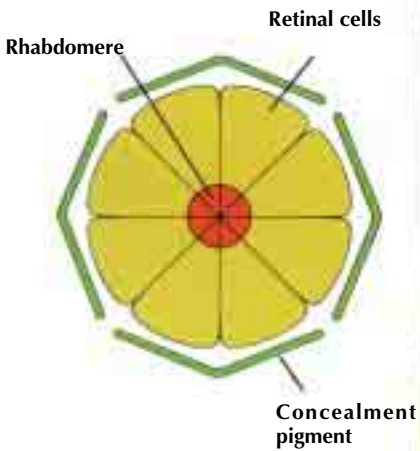
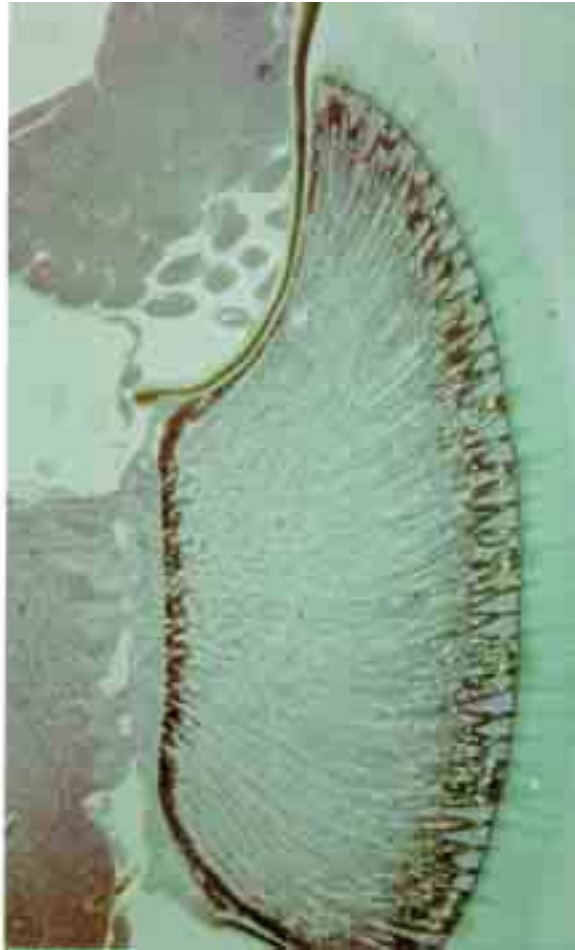
When scientists realized that bees make use of the Sun, they began researching how they find their way. First of all, the bee's eye was examined, and was found to possess a structure that allows these calculations to be performed.

The worker bee's eye is a very complex organ with 6,900 facets, known as ommatidia, each carrying out separate visual processes. Each one of these acts like an individual eye, and they stand aligned together, rather like straws in a bucket. Each one ends in a small, convex, transparent lens.<sup>86</sup> These lenses form the outer, glassy and oval-shaped surface of the eye. As well as the two compound eyes on either side of their head, a bee also has three simple eyes atop its head. It's estimated that these latter three are used to measure the strength of the light. The bee's eye is superior to the human eye in two respects: it can see ultraviolet light and perceive the plane of light polarization.<sup>87</sup>

These are the features that let bees determine the location and angles of



To the right, a cross-section of the bee's eye. The ommatidia (small eyes) can clearly be seen in the form of long lines. Each can perform the function of a separate eye and stand parallel like straws in a jar. Each of these eyes faces a slightly different direction from the others. Below, a cross-section of one of these components.



At the far left, the bee's head, with a single ommatidia to the side. On the outside of each of these is a transparent, convex lens. As well as the compound eyes on either side of their heads, bees also have three simple eyes, or ocelli (far left).



The bee's eye is created to perceive ultraviolet rays. In this way, ultraviolet light reflected from the petals of flowers give flying bees the full coordinates of the pollen.

Thanks to the special structure in their eyes, bees setting out in search of food can easily make out the flowers before them, just like the lights of an airport runway (right).



the Sun. Thanks to them, they're able to correct the directions they give to other hive members and find their targets without error as the Sun moves through the sky.



## Flower-Marking Methods

Before the foraging bees return to the hive, they deposit a special scent on their food source. Every worker has a scent gland in its body, which it can use at will. This gland, which is located at the rear of the bee, under normal circumstances is invisible from the outside. The bee can expose this gland when it so chooses, and spreads the gland's scent over the flower it lands on and its surroundings. This scent resembles the aroma of the *Melissa* plant and can easily be perceived by human beings. Bees are especially sensitive to the odor of bees from their own hives, and can detect it even from considerable distances.<sup>88</sup>

Thanks to the way in which bees mark flowers, other bees can recognize that most of the nectar has been drawn from a particular flower as

soon as they land on it, and they immediately fly off again, and thus avoid wasting time and energy.

## Flower Fertilization and Bees

If you watch bees gathering food in a field full of various flowers, something very interesting may catch your attention. A bee always moves between flowers of one particular species. It pays no attention to other kinds of flower as it flies from one to another.

Bees sometimes spend days visiting flowers of the same species, which behavior benefits both them and the flowers. A bee that lands on a flower for the first time and is unfamiliar with that flower's structure must spend a considerable time in order to find a single drop of nectar. But after landing on the same kind of flower five or six times, the bee begins to gain speed and competence, since it is able to attain its aim more easily.

This also benefits the flowers, because bees' preference for a single species permits rapid and efficient fertilization. Pollen from one flower cannot fertilize other species, and flowers are fertilized only by the bees traveling between the members of the same species. Bees make use of scent in order to find flowers of the same species.

At this point, it will be useful to touch on the subject of how fertilization takes place. As we know, bees

**Bees leave a scent on flowers they have visited previously and from which they've collected nectar or pollen. This way, subsequent bees do not waste time and energy on "harvested" flowers.**





visit flowers to collect both pollen and nectar, but in gathering pollen, they perform a vital function for the flowers: fertilization. In order to produce seeds, a flower's female reproductive organ has to unite with male gametes, enclosed in pollen grains. In other words, a quantity of pollen must unite with the stigma—the sticky tip of the female organ. Flowers are generally unable to transport pollen in their male stamens onto their own stigmas. The requisite union takes place thanks to insects, thus forming the seeds that will form new plants and new flowers.<sup>89</sup>

As we have seen, there is a very close connection between flowers and bees. Both have been created by God to complement one another. For example, flowers, which need to be fertilized by insects, produce nectar which will attract insects to them, and it is this which also attracts bees. Furthermore, flowers also attract insects by means of their scents or bright colors.

This relationship between bees and flowers is also exceedingly important for us humans, because beekeeping is of great importance to agriculture. A great many fruit trees and crops are fertilized by bees to a large extent. For that reason, some experts regard bees' contribution in this regard as more important than their production of honey. In the light of this, the verses in Surat an-Nahl about honeybees immediately come to mind, in which God reveals the way in which bees eat from all fruits:

**Your Lord revealed to the bees: "Build dwellings in the mountains and the trees, and also in the struc-**



tures which men erect. Then eat from every kind of fruit and travel the paths of your Lord, which have been made easy for you to follow." From inside them comes a drink of varying colors, containing healing for humanity. There is certainly a sign in that for people who reflect. (Surat an-Nahl: 68-69)

Other insects as well as bees fertilize flowers. Yet because of their large numbers, industriousness and the suitability of their bodies, bees can carry relatively greater amounts of pollen than other insects. A large part of agriculture depends on the pollination carried out by bees; indeed, some 80% of insect pollination is the work of bees. Did that pollination fail to take place, there would be a major reduction in the amount of fruit and vegetables produced.

### Harmony Between Bees and Flowers

Though bees play a most important role in flower fertilization, there are some flowers that they cannot pollinate. For example, since bees cannot distinguish the color red, they are unable to seek out—and pollinate—red flowers. Some all-red flowers, such as sweet bay, red carnations and wild flax, are pollinated by other insects. Besides their colors, these species of flower have other characteristics that also prevent their being pollinat-



#### **BOMBUS BEES**

Bombus bees play a major role in plant fertilization. As can be seen at the side, the tiny hairs on the body of the Bombus, larger than other bees, are covered in microscopic hooks. These make it easy for the bee to collect individual pollen grains as it visits flowers. The Bombus then stores the pollen by emptying it into the pollen baskets.

David Attenborough,  
*The Trials of Life*, p. 58.

*There is no creature on the Earth which is not dependent upon God for its provision. He knows where it lives and where it dies. They are all in a Clear Book.*

*(Surah Hud: 6)*



ed by bees. These species' nectar lies deep down in the flower. Insects seeking to pollinate these flowers must possess special organs in order to reach these flowers' internal regions. And of course, these insects must also be able to see the color red. In other words, the insects that will pollinate these flowers need to possess both a special organ to allow them to reach down into the depths of the flower, and eyes that can perceive the color red. In nature, only two species of insect can perceive the color red—wasps and butterflies, and moreover, both these insects possess a long proboscis with which they can reach down into the deepest parts of the flower.<sup>90</sup>

It's of course meaningless to try to account for such harmony in terms of blind chance. No random coincidence can give two different species of living thing physical properties so mutually compatible. This harmony proves that both were created by a single Creator: God created both to be mutually compatible.



**God has created a harmonious union between bees and flowers.**

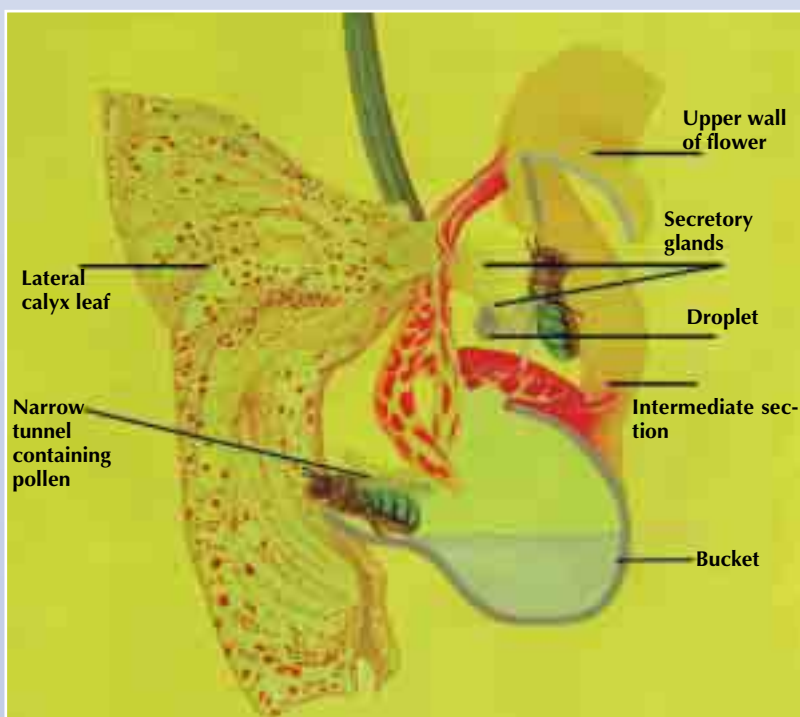


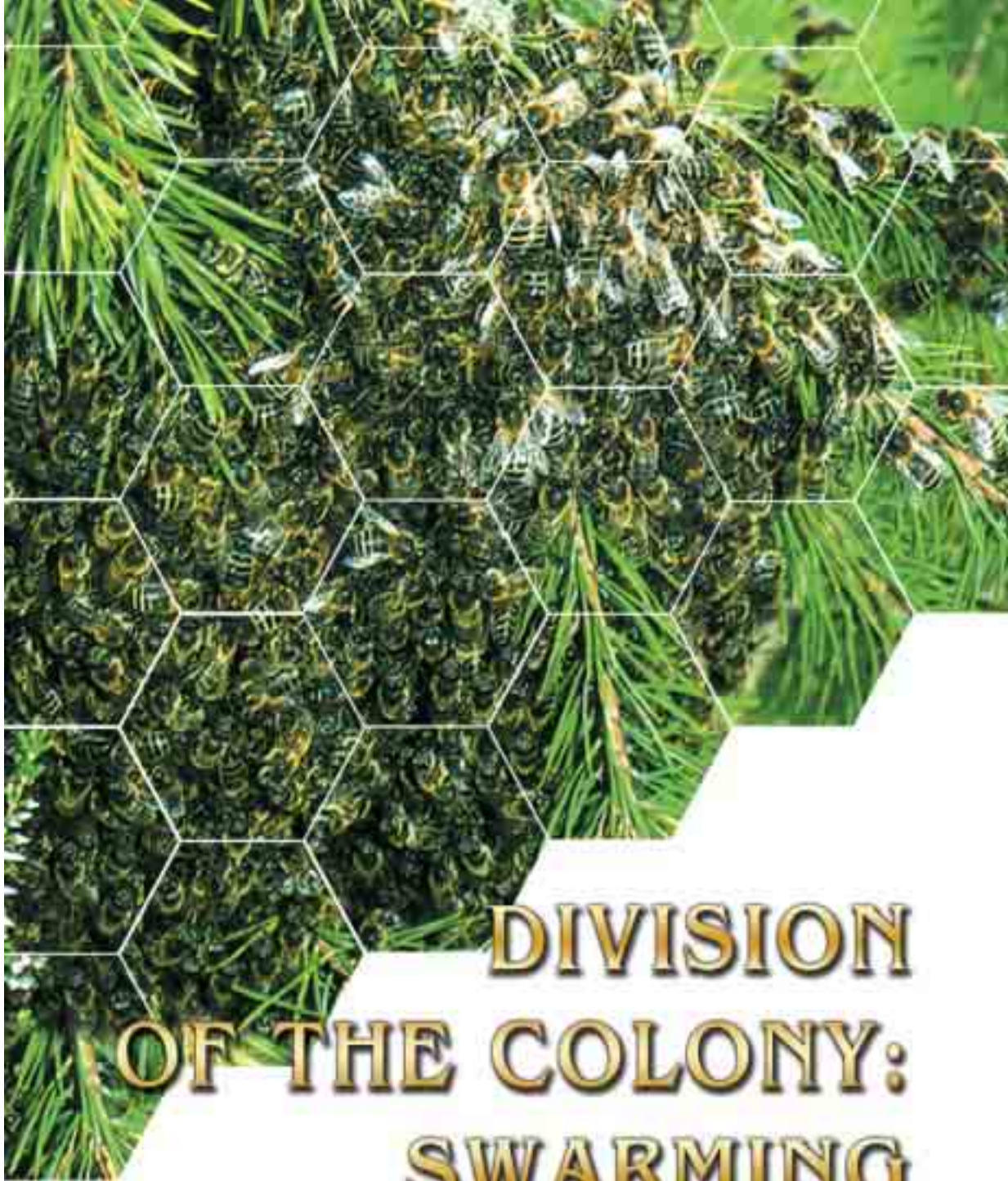
## THE BUCKET ORCHID AND BEES

One example of the harmony between insects and flowers is that between bees and the bucket orchids. The plant secretes a liquid that drips into the orchid's bucket. A bee drawn by the fragrance of the flower falls into the slippery part of the flower that contains the liquid. The bee has only one way out: a narrow tunnel, with pollen on its entrance. As the bee strives to escape, the pollen rubs off and sticks to its back. Shortly afterward, it escapes out of the trap and goes to another orchid, leaving behind some of the pollen stuck to its back, thus fertilizing the flower. The bee also acquires an aromatic substance with which to attract female bees. The harmony between these

two living things, plant and insect, is proof that they are both created by our Almighty Lord.

*Natural History,*  
March 1999, pp. 72-74.





*... [God is] the Lord of the East and the West and everything between them. . . . (Surat ash-Shu'ara': 28)*

**A**s already mentioned, from early spring on, the queen lays 1,500 to 2,000 eggs a day. If bees in the colony do not take precautions to respond to this increase, then the capacity of the hive will soon be unable to meet the needs of the rising population. Given the speed at which the queen lays her eggs, this means that between 45,000 and 60,000 bees are added in a single month. This rapid population rise will soon lead to congestion and malfunctioning.

As we know, the substance that the queen releases is one of the factors that establishes order in the hive. As the number of workers increases, the level of that “queen substance” to each worker must thus decrease. The reduction in the quantity of this substance indicates that the time has come for the hive to solve the problem of its rising population.<sup>91</sup>

When there is a rise of population, the measures to be taken are clear: either the hive has to be expanded, or else the population has to be reduced. Bees implement the most appropriate of these two options. Expanding their accommodations is no answer, because the problem stems from the insufficiency of the queen mandibular pheromone, rather than a lack of space. When there is too little of this substance, the females’ ovaries start to develop and the colony’s distinctive odor will weaken. As a result, the workers will set about constructing new queen cells—and the equilibrium in the hive will be damaged.

The population-planning method implemented in beehives is the most rational option. When the population rises too high, the bees set about lowering it—but not by killing the larvae and pupae, as they must do in the winter months. They adopt a very rational solution, beneficial from all points of view. When the population of a hive rises, one portion of the bees leave in a group, together with the queen and begin looking for a new place to settle.

This practice, known as swarming, allows the surplus bees to establish a brand-new colony.

## Preparations Before the Bees Set off on Their Journey



The first phase of swarming comes at the beginning of spring, when bees start building cells for drones. Since it takes longer for these males to grow (queens develop from egg to adult in 16 days, workers in 21 and males in 24), their combs need to be ready by early April.<sup>92</sup> It's worth noting that the cells for the males are prepared before the queen's mandibular pheromone is entirely exhausted. That's because under normal circumstances, the workers need to prepare queen cells when the levels of this pheromone go down. Nevertheless, the worker bees start building male cells, and the drones hatch out in early May, which explains why the cells for the males are readied.

As we know, males can search for the queen two weeks after they emerge. Unless the drones can find a queen to mate with, their existence at this point will be meaningless. Therefore, the queen needs to be ready for her mating flight at this time. If the workers are late in preparing the cells for the males, either the queen will fail to mate, or the process will be delayed. Since the queen cannot start laying eggs until after she mates, this will represent a threat to the colony.

The old queen, who does possess the ability to lay eggs, leaves the hive long before the new one emerges. This situation, which may appear very confused at first glance, is resolved by the workers with perfect timing.

At the same time that the workers begin to construct new queen cells, they oblige the old queen to abandon the egg-laying process, because the time to migrate has come and necessary preparations must be made. Therefore, workers start feeding the old queen less royal jelly. The reduced level of this foodstuff slows or halts her egg-laying. But there is another reason for restricting the food given to the queen. In order for her to leave the colony with the swarm that will accompany her, it's vital that she not be too bulky.

This method employed by the workers soon bears fruit, and the queen starts to move about more quickly. Within a short time, she becomes as mobile as the other bees.<sup>93</sup>

## Beginning the Search for a New Hive

The workers, who at other times forage for pollen, nectar or water, now set about seeking a new site for their colony. They usually leave their hive in late spring or early summer. In this season, pollen and nectar are plentiful, temperatures warm and the Sun in the sky longer. These conditions provide the necessary environment for a bee community to leave the old hive.

In order to store energy before departure, the bees setting out to establish a new colony fill their stomachs with as much honey as they can, because they will have no time to visit flowers. As a result of this feeding, their abdomens expand so much that their bodies lose the elasticity necessary to use their stings.<sup>94</sup> This means that the bees are exceptionally peaceable—important for the safety of human beings. Bearing in mind that about half the colony will leave during swarming, an obvious danger would otherwise be posed by 20,000 to 30,000 aggressive bees.



A swarm leaving the hive, with the old queen in the middle of the swarm. The colony will wait on the tree until the scout bees show the other members where the new hive is located.

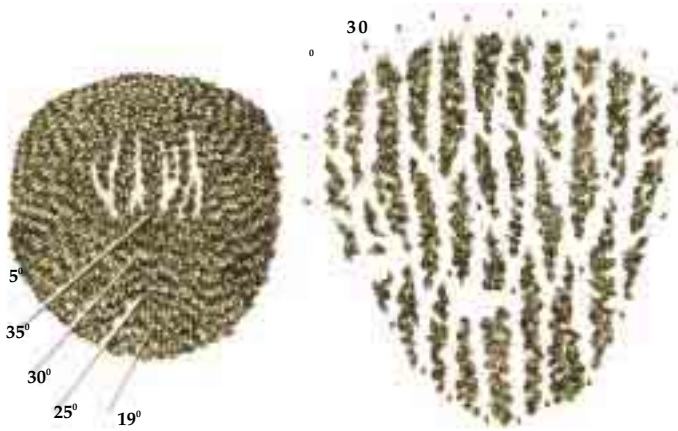
When the new queen is about to emerge from her cell, the old queen bee leaves the hive accompanied by a group consisting of worker bees and a few drones. After this swarm leaves the hive, it forms a cluster, often rather like a bunch of grapes, on a nearby branch or projecting object.<sup>95</sup> The queen is in the middle of this mass. The workers literally form a wall around her with their bodies, thus ensuring her safety.<sup>96</sup> As the bees come together in this disciplined manner, the odor unique to the colony soon forms.

As already mentioned, every worker has a scent gland in its body which it can use for marking flowers whenever it wishes. This gland is externally invisible when not in use. Yet the bee can expose it when it wants, whereupon it exudes a scent. The scout bees use this to mark new places they find. Bees are exceedingly sensitive to the scent of their own colony, and the scent left by the scouts can be perceived even from considerable distances.<sup>97</sup> The bees are thus able to find their new destinations easily.



**A swarm of bees waiting on a tree to make their nest. When the scout bees find a site for the new hive, this mass will disperse.**





The pictures to the side show a swarm regulating the temperature of the mass. Under cooler conditions, the workers clump together tightly and provide less internal ventilation, in order to conserve heat (far left). Under warmer conditions, they spread out in order to cool down the center of the clump.

### Scout Bees in Action

While one part of the colony waits in a mass, the scout bees are very active. Indeed, they have begun their preparations long before. A few days before leaving the hive, these scouts have spread out in search of new settlement sites. On occasion they fly for several kilometers.<sup>98</sup>

The scouts carefully examine the fissures and tree trunks in which they might establish a new hive. The large number of scouts seek possible new locations for the colony and literally carry out settlement planning, make various calculations to arrive at a common decision of the suitability of the new hive site. Then they again act together, returning to the colony and leading it to the new site.

If a scout finds a suitable hole or cavity, she examines it systematically, sometimes for hours on end. She checks the external appearance by flying around it. She also generally enters the hole and walks around in it, first moving to the entrance, and then walking around the inside, examining the inner surfaces. Thomas Seeley of Yale University, who made a special study of this, calculated that a single bee walks more than 50 meters (164 feet). In his experiment, using artificial cylindrical hives capable of revolving around their own axes, Seeley revealed how far bees had to walk to examine the interior of the hive, and that in this way, they calculated the volumes of dimly illuminated cavities.<sup>99</sup>

The bees flying off to look for new sites can sometimes be as many as two dozen. Thanks to their efforts, the colony obtains information about several possible sites at the same time. Eventually, the workers decide



Bees swarming

among the potential sites by visiting each one, reducing them to two or three. Eventually, agreement is reached on which site will be best, and the new hive is established there. The colony thus selects the best possible site—at least, according to the scout bees' evaluations.

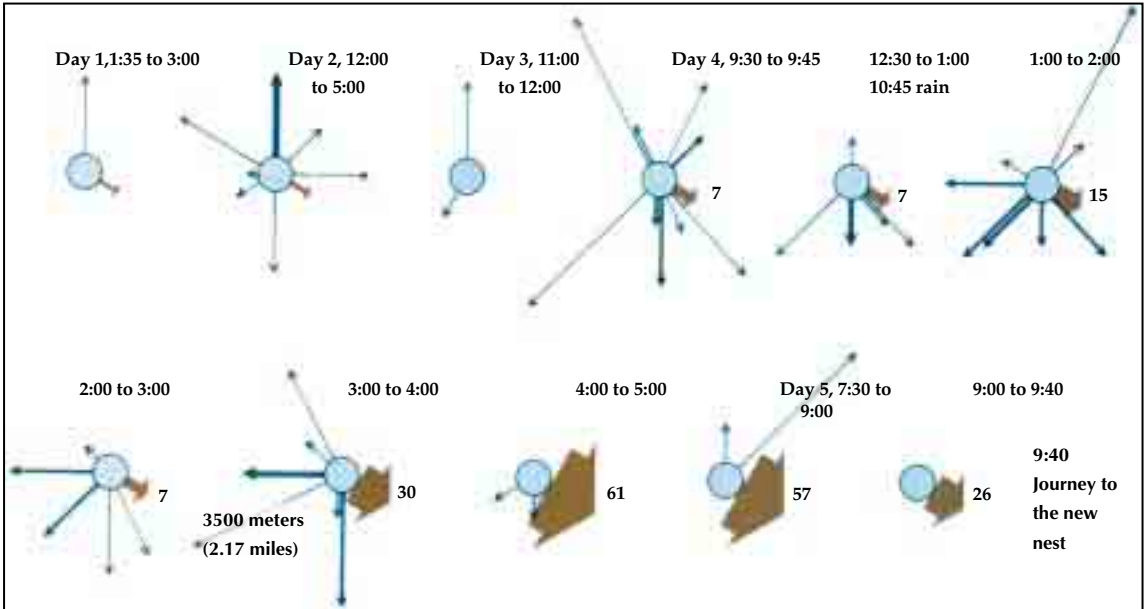
The decision-making process over the site of the new hive may last for several days. Each scout inspects each potential site very carefully, and it takes time for up to 500 workers to compare different alternatives and agree on

a common decision. During this time, the other bees continue waiting on the tree in a mass, as already described, and set off for the new nest only when a final decision has been taken by the scouts, who accompany them on their final leg of the journey.

To understand the importance of what the scout bees do, let us re-examine the stages of this process, one by one. First, how do the scouts decide on the suitability of the new site they find?

When looking for a new nest, the scout bees bear a number of details in mind such as its height from the ground, whether any holes in it can be patched, and the size of the internal area. They also pay special attention to the suitability of the entrance. It must be small enough to prevent robber bees, squirrels and birds from getting in, yet wide enough for bees returning laden with nectar or pollen to enter. Otherwise, these bees will have to wait at the entrance in order to take their turns. Smaller entrances





The scout bees move off in search of a new hive and return to inform the others of the sites they have found. Eventually, unanimity is established and the group moves off. The above drawings represent the dances observed to be performed for four days until a common decision is arrived at. North is pointing upwards. The length of the lines indicates the distance of the region and the thickness, the number of dances performed in that direction. (James and Carol Gould, *The Animal Mind*, p. 66.)

are generally preferred, since if the entrance is very wide, it will be more difficult to defend. In addition, since there will be a major loss of heat through ventilation, it will be more difficult to regulate the hive's internal temperature.<sup>100</sup>

Another of the necessary features in order for a site to be used as a hive is the size of the nest. Let us consider a hollow tree trunk, for example. If the inside is very large, it will be difficult for the bees to keep the hive warm. However, bees generally prefer the nest to be large rather than small, since unnecessary spaces can be filled with propolis. Problems that arise if the hive is too narrow will be more serious. If the area used for storing honey is too small, insufficient quantities can be laid by for the winter—a severe problem that could lead to the death of the entire colony.<sup>101</sup>

Another detail concerns which direction the hive's entrance faces. A

***Your Lord revealed to the bees: "Build dwellings in the mountains and the trees, and also in the structures which men erect."  
Surat an-Nahl: 68)***





**These pictures show bees which have arrived at a joint decision and constructed their nest in tree trunks.**

north-facing entrance will be colder, thus unsuitable for a shelter. The scouts also bear this important detail in mind when looking for a new site.<sup>102</sup>

Once they identify the site and decide on its suitability, scouts mark it with their scent, just as they do with flowers. The bees expose their scent glands and remain in the hive site for a while, thus allowing it to take on the scent of the colony.<sup>103</sup>

## The Colony Goes into Action

Shortly after, the scouts arrive back where the colony is waiting for them, and provide directions for them by dancing—the same dance performed by bees when they locate a food source. The direction of the site determined as being suitable is shown by the wagging part of the figure-eight dance. The site's suitability is indicated by the exuberance of the dance. In the case of a site which fulfils all the necessary conditions, bees may dance for half an hour or even an hour. But if the site is not ideal, then they perform the dance less enthusiastically.<sup>104</sup>

Bees do not head off in one direction all at once, because the scout bees have explored an area of many square kilometers. And on its return to the colony each scouting group will recommend a different site. There may be several bees dancing at one time, and these groups will sometimes indicate different directions.<sup>105</sup>

Bees alerted by the scouts' dance to leave the swarm's cluster search the area until they detect their own colony's odor. The most suitable site receives the largest number of bees, which in turn accumulates the greatest amount of colony odor at that site.<sup>106</sup>

Within one week, the hanging cluster of bees like a bunch of grapes dis-



The scout bees dance to indicate the distance and direction of the possible locations for the new nest. Each arrow represents the dances in the direction of a particular site. The length of the arrow indicates how distant the site is, the angle its direction, and the thickness the number of scouts that have danced for that region.

The drawing at the far left shows the dances performed in four directions before unanimity was reached.

The drawing to the side shows the dance performed right before departure for the new nest.

perses and the bees fly off en masse towards the new site. When the colony begins moving, bees familiar with the site lead it with their scent, so the swarm can find the site without needing any further assistance. The queen has to move together with the swarm, since her presence maintains the unity of the colony. If the queen is not accompanying the colony, the community will return to where it had been before.<sup>107</sup>

The behavior of bees in the establishment of a new colony is evidently very conscious. The planning and logic used to make a selection observed in bees very definitely require intelligence. Yet it is impossible to speak of the intelligence of individual bees. As has already been made clear, a bee is, all in all, nothing more than a tiny insect. Its brain capacity is severely limited. It might be reasonable if all these activities were carried out by human beings possessing intellect and logic. But since we are referring to bees, we need to stop and consider.

How do these creatures manage to carry out such wide-ranging planning? These are not steps that unintelligent, and unaware creatures could learn by chance, since the verb "to learn" implies logic and will. Bees do



If bees are unable to find a suitable site, they make a temporary hive in a tree. The picture to the side shows the combs constructed in the open air, exposed to all kinds of danger.

not, of course, possess these attributes. It is God, with His infinite knowledge, Who causes them to exhibit this conscious behavior and signs of intelligence. As He does all other creatures, God protects and watches over bees, teaching them the systems they need. As is revealed in one verse, “. . . **There is no creature He does not hold by the forelock . . .**” (Surah Hud: 56).

### **What Happens in the Old Hive?**

Once the swarm has left, half or maybe more of the original bees remain in the old hive.

Since the old queen leaves the hive before the new queen emerges, the hive remains without a queen for a time—but for only a few days. Shortly after swarming, one of the young queens completes her development and leaves her cell to embark on her new life, after killing her rivals.<sup>108</sup>

If the old queen does not leave the hive before the new potential queens emerge from their cells, this shows that she has grown old. The new queen will then sting her to death.

Sometimes, however, the old queen does not abandon the hive, even though she is not senile or feeble, but due to weather conditions. This could be a very dangerous situation, because if the new queen emerges while the old one is still in the hive, the two will fight and one must kill the other.

In order to prevent such chaos, which would damage the hive's equilibrium, the bees resort to a most astonishing method. The potential queens which have completed their development and bitten through their cocoons are imprisoned with cell covers that are stronger than usual. The bees do not forget to leave a small space open, however, through which the workers will later feed them.

Yet the problem does not end here. The old queen moves through the hive more actively than ever. If she detects the new queens, she will try to destroy them. Yet this is not permitted. The workers gather over the new queens' cells and repel the old queen if she tries to harm them.<sup>109</sup>

All the workers' efforts are aimed at protecting the new queen, and hence the colony itself. The new queens are protected by the precautions thus taken, which allow for every possibility.

On occasion, a colony will need to release more than one swarm. In that event, that is, if the new young queen is to leave the hive with an entourage of workers for a second swarm, the workers immediately begin raising another new queen.<sup>110</sup>

## **BEES BEHAVE ACCORDING TO**

### **GOD'S INSPIRATION**

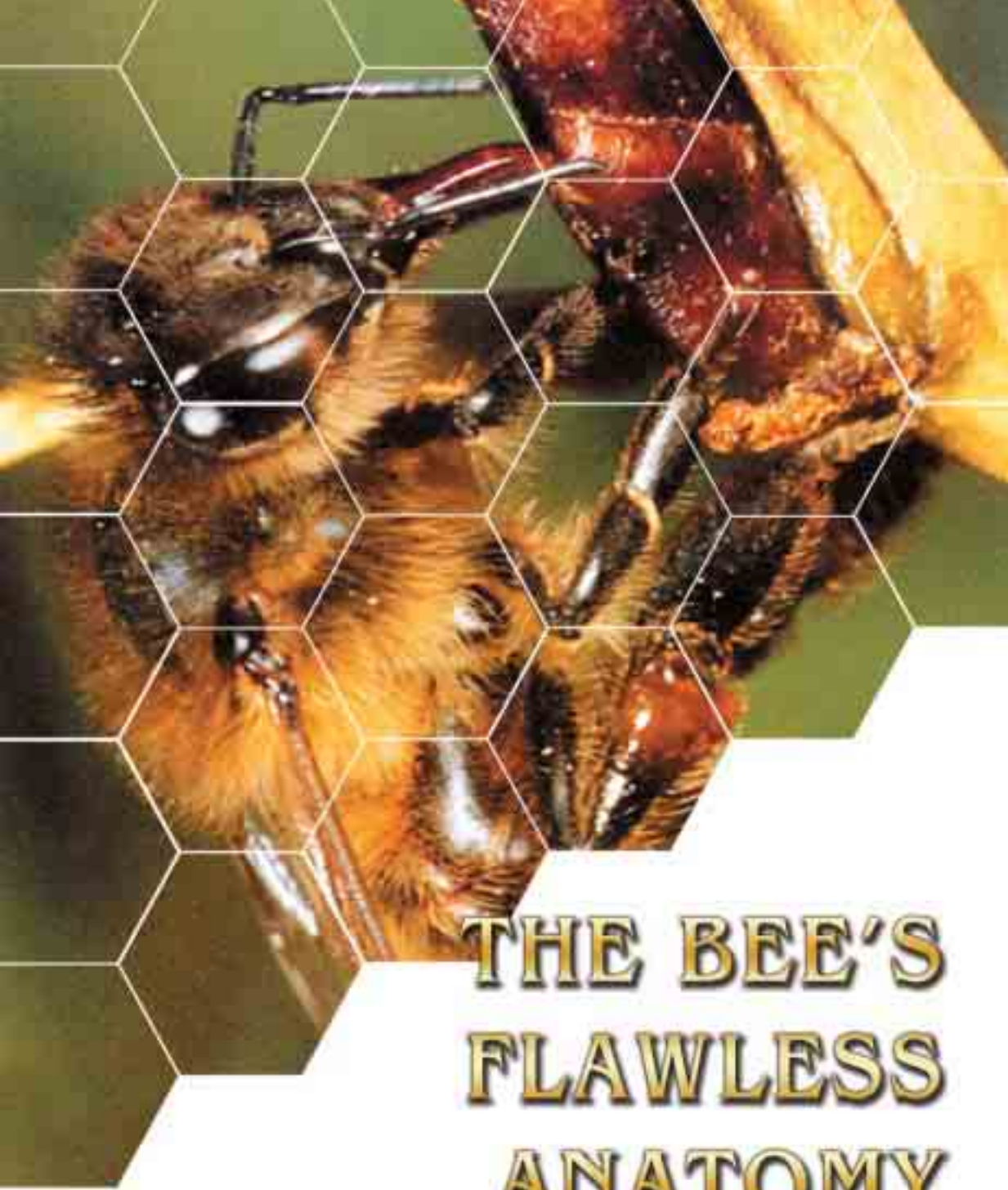
As we have seen so far, bees are some of the most astonishing creatures in the animal kingdom. The honeycombs they build are architectural marvels, which they produce with such patience with wax drops no larger



than a pinhead. They pay hundreds of visits to the larvae every day, tirelessly. They display self-sacrifice in defending the hive, and the work that goes into making honey and the discipline they are able to maintain within the hive all amaze scientists.

Bees analyze their surroundings in their own language, take decisions that may vary according to the urgency of the situation, and act upon them. In short, all their behavior displays a definite intelligence and consciousness, as we have seen in a number of examples. As have been emphasized several times in this book, however, this consciousness and intelligence are not actually their own.

God refers to the bee in one verse, **“Your Lord revealed to the bees . . .”** (Surat an-Nahl: 68), revealing that everything these creatures do, including their conscious behavior, comes about by His inspiration and revelation.



# THE BEE'S FLAWLESS ANATOMY

*The kingdom of the heavens and the Earth and everything in them belongs to God. He has power over all things.*

*(Surat al-Ma'ida: 120)*



**A** report in *Byte*, one of the world's most popular computer magazines, contained very interesting information about honeybees.

The magazine compared bees' brains to computers! According to the results of a study reported in the magazine, the bee brain works at a rate superior to the most highly advanced computer. Today's most advanced computers can compute 16 billion computations a second. The figure for the bee brain is 625 times greater than this: 10 trillion.

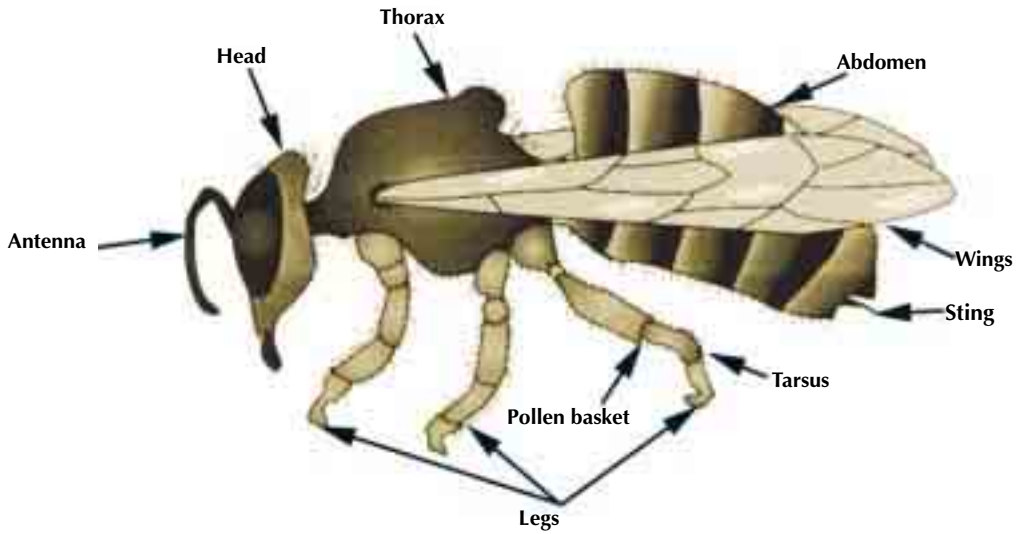
What's more, the bee brain also consumes less energy than a computer in performing all these computations. The energy consumed by 10 million bees is the same as that used by a single 100 watt bulb. (The bee brain consumes less than 10 microwatts of energy.)<sup>111</sup>

As can be seen from this comparison, every organ in the bee's body, including its brain, has been specially created in order to perform the functions it is engaged in at a given time. Its exoskeleton, for instance, is exceedingly strong, and its respiratory system allows more oxygen to reach the soft tissues by making better use of the air. Its muscular structure possesses different characteristics in different sections of its body, depending upon requirements for movement. The wing muscles, for instance, lack the outer membrane found in the other muscles, in order to admit more oxygen. Similarly, its smell and taste systems are perfectly suited to such tasks as gathering nectar.

As we saw in the preceding chapters, all the bee's flawless structures formed inside a tiny cell in which it completed its development stages. The physical structure of bees is just one of the proofs of God's incomparable creative artistry and infinite knowledge. God reveals that His knowledge pervades everything:

**Your deity is God alone, there is no deity but Him. He encompasses all things in His knowledge. (Surah Ta Ha: 98)**

This chapter will provide brief information about bees' bodily systems.



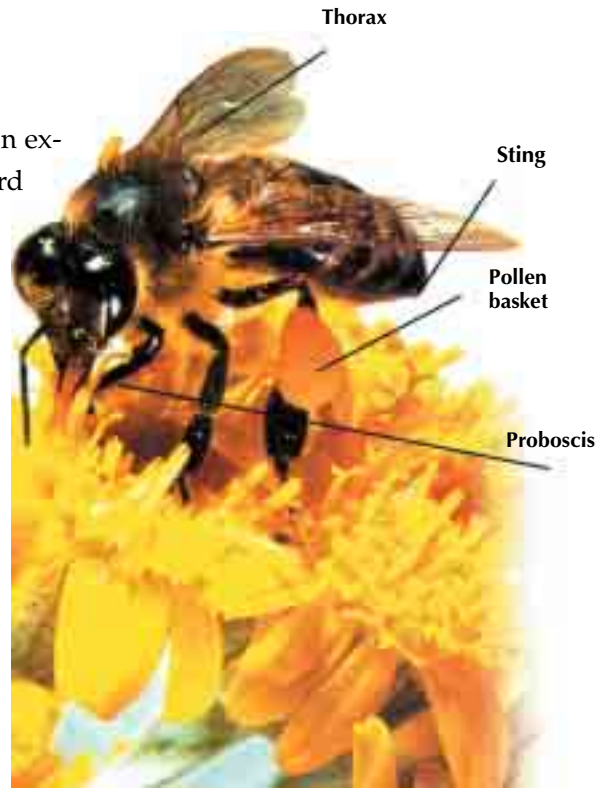
## The Bee's Exoskeleton

Like other insects, bees have an external skeleton consisting of a hard jointed shell, formed of a layer known as chitin. These layers have been created to be hard enough to form the external skeleton structure.<sup>112</sup>

Other substances in the skeleton are water, protein and fat.

## The Respiratory System

The bee's respiratory system, known as the "tracheal system," begins with external respiratory openings, or namely spiracles, and is then divided up into branches in such a way as to reach every organ in the bee's body. The trachea arms widen to form air sacs that are large albeit few in number, and used to store air. The small branches and tubes



emerging from the sacs extend as far as the tissues. Bees can accelerate the passage of air into their bodies by contracting these sacs, which speeds up the oxygenation of the tissues.<sup>113</sup>

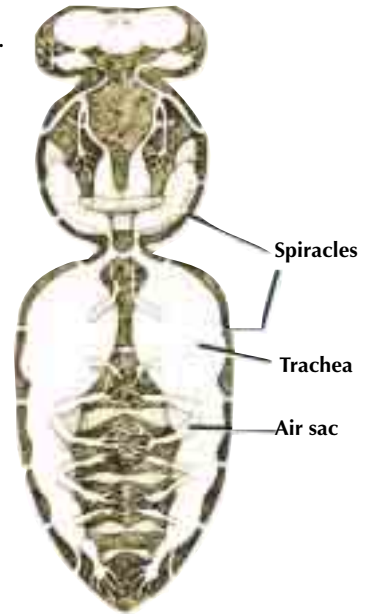
## Muscular Structure

Each muscle in the bee's body consists of different numbers of muscle fibers, consisting of longitudinal cells. To fulfill its functions, every living cell requires energy. The mitochondria provide this for the cells. In order for bees to be able to move, their muscles need to have the property of contraction—a need met by structures known as myofibrils, found in large quantities in the fluid of the muscle fibers and which do indeed possess contractibility.

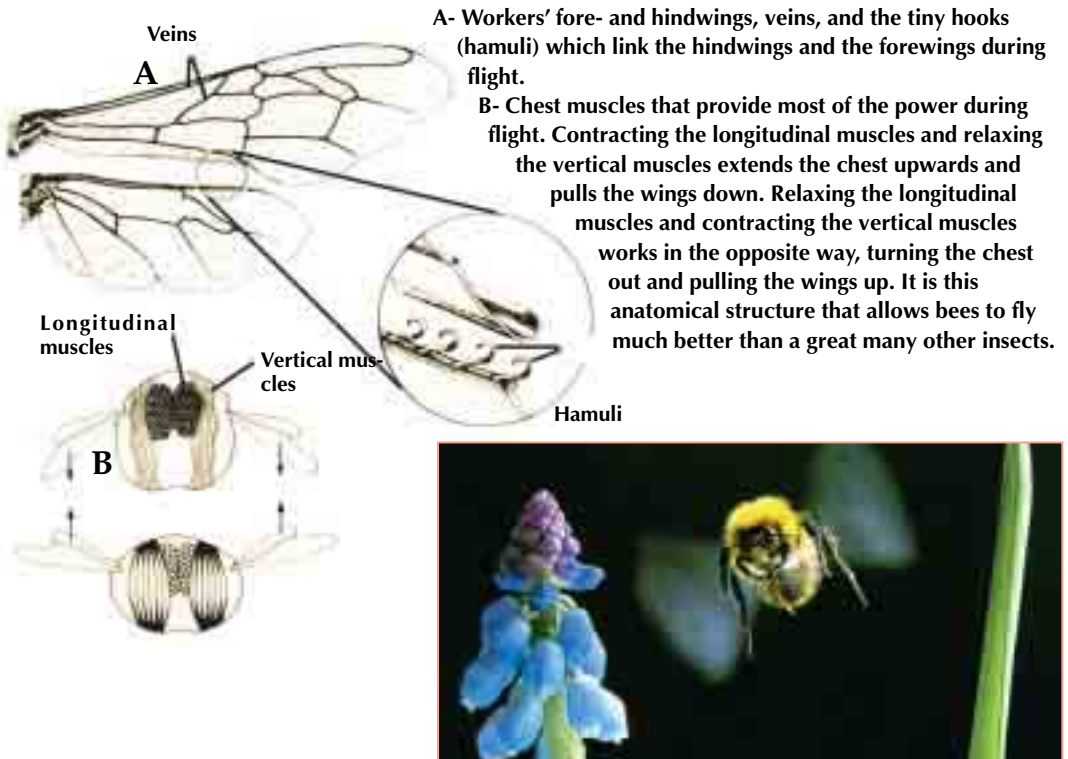
Myofibrils consist of proteins and contain strings of large, oval mitochondria. The cytoplasm of the muscle fibers fills with glycogen, that the bee uses as a store of energy.

The myofibrils in bees' fast-moving wings are 2.5 to 3  $\mu\text{m}$  (micrometer) across.<sup>114</sup> These minute structures allow the honeybee to beat its wings 250 times a second.<sup>115</sup> When laden with pollen, a bee can fly at 9 kilometers (5.6 miles) an hour, and 13 kilometers (8 miles) per hour when not laden.

The structure of the muscles allowing the bee to move changes according to their area of use. For example, those muscles like the wing muscles that must move very quickly lack the external membrane of the other muscles, in order to admit the requisite oxygen. In addition, the bee's entire body is equipped with tracheal tubes to carry the oxygen that its body needs.<sup>116</sup>



**The vascular system consists of breathing holes that allow air to enter and leave the worker's body and main trachea and air sacs which carry the air into and out of the cells.**



## The Wing Structure

Bees may appear to have two wings when they fly, but they actually have four, which they move as if they were only two in number. This use is better suited to the laws of aerodynamics. If these wings acted separately, they would be useless for flight. Yet thanks to the special structure of their wings, bees can move faster than a great many other flying creatures.

On the bee's hindwings are a large number of hook-like projections. These attach to the folded rear edge of the forewings, allowing the two wings to act as one. When at rest, these tiny bonds are released, and the fore- and hindwings are left independent again.<sup>117</sup>

## The Olfactory System

Bees' scent receptors are on their antennae. (Contrary to human beings,

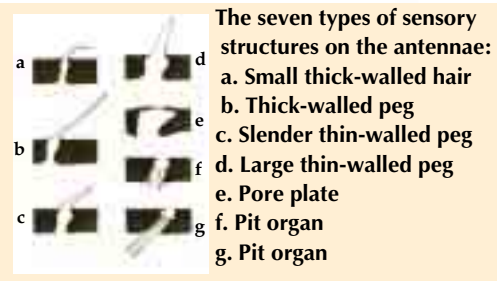
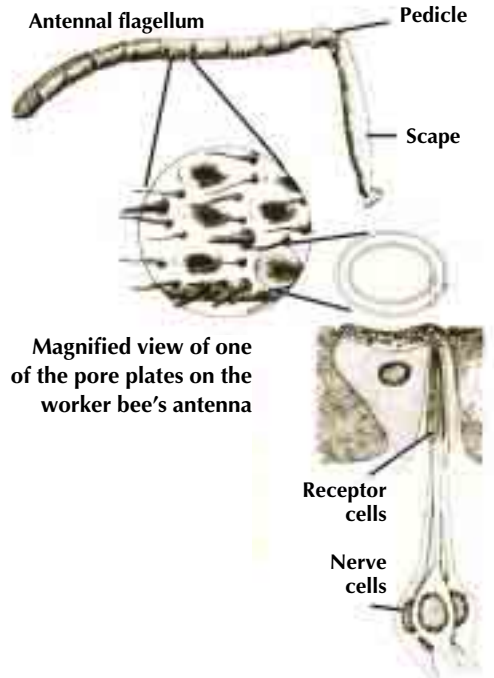
insects' scent-receptors lie not in their respiratory openings.) Yet these sensory nerves do not make direct contact with the substance being smelled since insects' bodies, including their antennae, are covered in a shell of chitin.

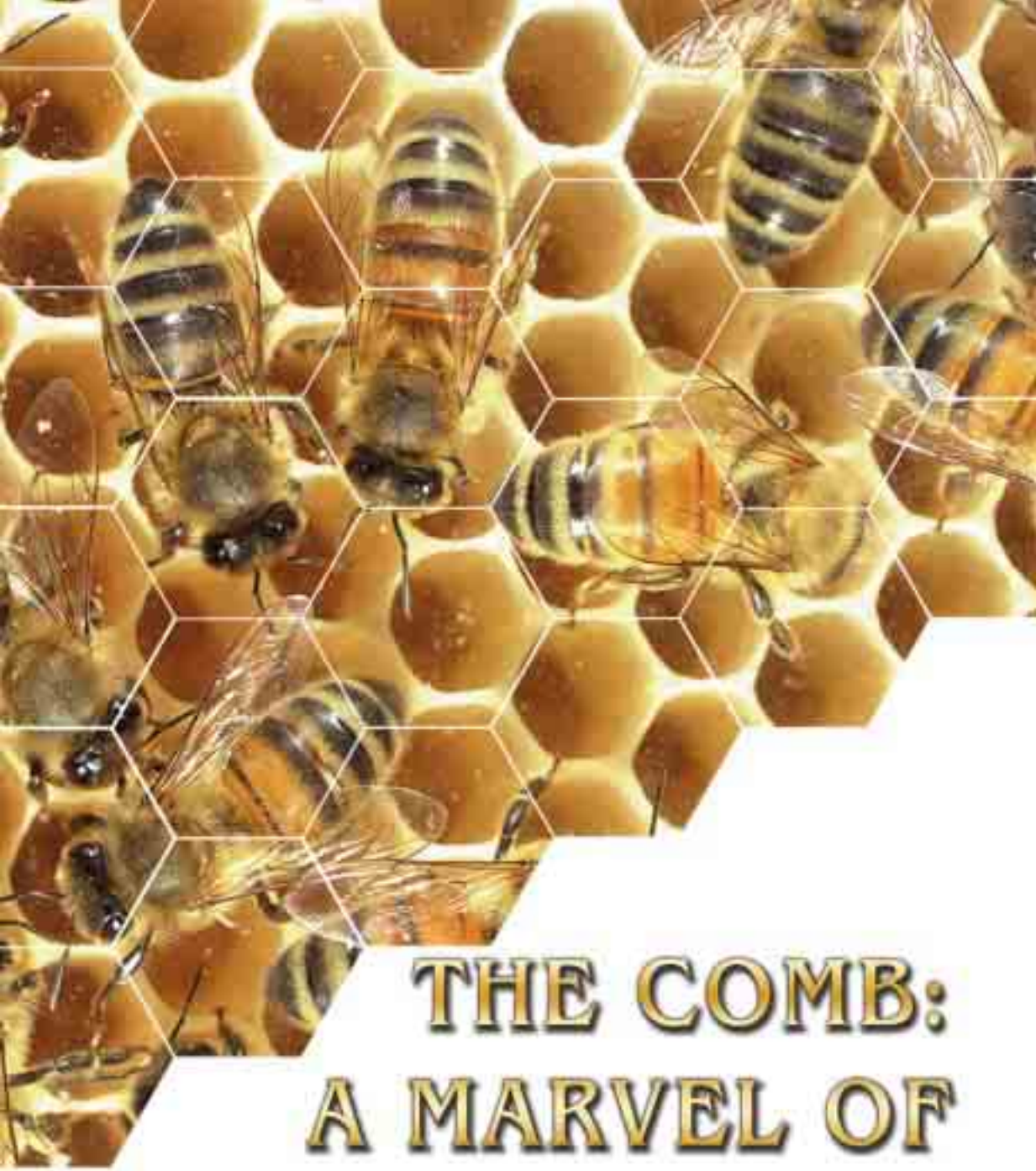
Under a microscope, the bee's antennae can be seen to have a large number of pore plates. The olfactory nerves from its brain terminate at these plates, which are covered in a special membrane that helps protect the nerve endings. Yet these are still able to detect scents. The area between the pore plates is covered with sensory tiny hairs.<sup>118</sup>

### The Taste System

Bees' taste organs, in their mouth cavities and proboscis, enable them to distinguish sweet, sour, bitter and salty tastes.

Of these, sweetness is the most important for honey-gathering bees. In particular, bees are well able to distinguish the kinds of sugar necessary for themselves. We can make a comparison here between bees and human beings. Humans may not be able to differentiate very well between sugar and artificial sweeteners with no nutritional value. But it is impossible to deceive bees with artificial sweeteners: A bee can immediately tell the difference between these and real sugar, and will refuse to take water containing the former. Because bees use the nectar they collect to make honey, any error in recognizing sugar will lead to poor honey or none at all.<sup>119</sup>





# THE COMB: A MARVEL OF ENGINEERING

*[God is the] Lord of the heavens and the Earth and everything  
between them, the Almighty, the Endlessly Forgiving.*

*(Surah Sâd: 66)*

One of the most amazing distinctions about bees is the hexagonal comb cells they make. Watching a large group of bees building honeycombs, one assumes that the end result must be total confusion. There seems little chance that these insects, which all seem to be acting independently of one another, could ever produce such imposing structures. Contrary to appearances, however, bees work together in building the comb, in total harmony and in an exceedingly ordered manner. In fact, although they start from different points, they all build cells of exactly the same size. The joins where they meet in the middle are invisible, and there is never any error in the angles of their hexagons.

Bees build combs only when there is a need in the hive. They build these for shelter, storing food and raising larvae, and every aspect of the combs is regulated. Each is double-sided, for instance, with cells sharing a common base; and each comb face can have hundreds or even thousands of cells, produced in an ordered manner to be filled with honey, pollen and eggs.

The top of the comb down to the middle is filled with honey. Pollen is stored underneath these, with eggs at the very bottom. The honey stores also continue at the sides of the hive. However, the workers always store a few rows of pollen between the larval chambers and those used for honey.<sup>120</sup> This prevents the three contents—honey, larvae and pollen from becoming mixed up in the near-total darkness of the hive. Honey and larvae being kept separate is very definitely most of all to humans' benefit, otherwise bee-keepers would face an irresolvable problem: Seeking to separate one part of the honeycomb in their efforts to extract the honey would inevitably harm the new members of the colony. The presence of larvae in the honey would also make it far less palatable.

Again, conscious behavior permits this separation. In appearance, there is no difference among the cells in the comb for larvae, pollen and honey—they are all identical. But despite this resemblance, as we have already seen, the queen never makes the mistake of laying her eggs in empty cells intended for honey or pollen, but always lays them in the right



The cells of the comb are filled with honey, pollen and eggs in a specific order. From the top to the middle: honey. The middle part: pollen. The bottom: the larval chambers. The cells for the new queens are built at the very bottom.



place. No doubt that this is a discriminating ability given her by God.



## What Do Evolutionists Think about the Construction of the Combs?

Like all other living things, honeybees have their own unique forms of behavior that are full of questions for evolutionists. They have no answer to a great many questions, such as the combs made by honeybees and the communication among bees, simply because it is impossible to account for bees' social lives and attributes in terms of evolutionary mechanisms.

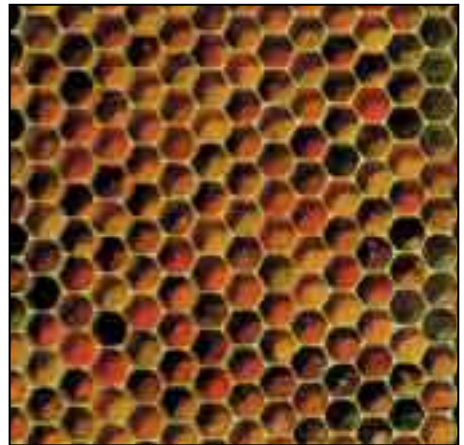
In a number of statements, Charles Darwin admitted that he found it difficult to explain the behavior of bees and ants, known as "social insects" because of the way they live in colonies, in terms of the mechanisms of his theory. In one question he asks in *The Origin of Species*, Darwin emphasizes the inconsistency of the theory he originated with regard to instincts:

Can instincts be acquired and modified through natural selection? What shall we say to the instinct which leads the bee to make cells, and which has practically anticipated the discoveries of profound mathematicians? <sup>121</sup>

### The Comb's General Structure



If one divides a comb down the middle, a most interesting vista opens up. The comb has a partition wall that, like the other parts of the comb, is made from wax and forms a common foundation for the mirror-image cells on both sides. The common floor of the cells is not level, but a series of depressions are made to fit into each other in order to save space. The side walls of



**There is a most regular structure in the combs, so that the honey and larvae never become intermingled.**

each hexagon stand at a slight incline in respect of the partition wall. This incline prevents honey flowing out of filled cells.<sup>122</sup>

In addition, there is also a hierarchy in the hive, in that the cells for workers are higher up and those for the drone males, which are fewer in number, are lower down. The queen cells are constructed at the very lowest level. All these brood cells are constructed according to need. For example, when the number of males in the hive drops, or at the end of winter (during winter, there are no drones in the hive), the bees start to make the rather larger cells to accommodate the males. In the same way, queen cells are constructed only when a new queen is required in the hive.

In the construction of the combs, there are a great many other important details such as the mathematical calculations required during the production and use of the raw material for the comb—all quite astonishing.



## The First Stage in Comb Construction: Wax Production

Beeswax is the main building material in the comb. Bees secrete wax from four pairs of glands under their abdomens. Where these glands meet, there are two small apertures. Here the wax is secreted, in small, thin scales. To collect this wax, bees use the hooks made of the small hairs on their hindlegs. They then push the wax forward to their middle legs, then to their forelegs. (Bees have six legs.) Finally, they pick the wax up in their mouths and make it malleable by chewing it.<sup>123</sup> As soon as one scale of wax is removed, another immediately emerges behind it.



The wax emerges as plates in the apertures above.

In the secretion of wax, heat is the most important factor. For that reason, when workers begin to construct the comb, they first come together in a chain resembling a large ball. The 35 degrees centigrade (95°F) temperature necessary for beeswax to become malleable is thus ensured, and thus it becomes a pliable substance suited to construction.

Beeswax is white when first secreted. After pollen and other materials are mixed into it, the color turns yellow and brown. The chemical ingredients of beeswax are as follows:<sup>124</sup>

- Hydrocarbon . . . 14%
- Monoesters . . . 35%
- Diesters . . . 14%
- Hydroxy-polyesters . . . 8%
- Free acids . . . 12%

The process of wax production necessitates substantial quantities of energy. Bees consume approximately 22 kilograms (48.5 pounds) of honey



in order to make 1 kilo (2.2 pounds) of beeswax. Bees take beads of wax from their secretion glands in a size no larger than the head of a pin.<sup>125</sup> This makes it clearer why beeswax is so valuable. Bees get the maximum use out of beeswax by using even the very tiniest particles. Indeed, it has been observed that even when they must abandon the hive entirely, they prefer to carry beeswax to the new hive rather than produce new wax by consuming honey. The German scientist N. Koeniger researched this subject and found a colony which was abandoning its old hive to establish a new one. The following day, when the workers returned to the hive, Koeniger observed them chewing up the wax from the old hive and carrying it off to the new one. The reason for this determined behavior is that so much of the bee's energy goes into wax production.<sup>126</sup>

Bees use their wax in a most economical way to build the most honeycomb with the least possible amount of wax. For example, it has been calculated that bees use only 40 grams (1.4 ounce) of wax to make a comb 22.5 by 37 centimeters (8.9 by 14.5 inches) in dimension. Such a comb can hold more than two kilograms (four pounds) of honey.<sup>127</sup>

## How Did Beeswax Come into Existence?

Comb construction depends on the existence of wax. The fact that this substance, ideal for the making of combs, is produced by bees is in itself a proof of creation.

Evolutionists maintain that bees didn't possess this attribute at the time they first came into existence, and that all their attributes and behaviors came into being gradually, as the result of a series of coincidences. It will now be useful to consider the unfounded nature of these claims by asking a number of questions that demand answers.

First of all, how did bees discover the ingredients of beeswax—which consists of a substance completely unknown to them?

How is it that every single bee has been able to employ the same for-

**Left: Honeybees beginning construction work. In order to obtain the necessary temperature for the production of wax, the bees first cling together, raising the temperature. They then shape the wax in their mouths and construct the comb, which consists of perfectly hexagonal cells.**

mula for millions of years?

How did bees manage to form the glands and organs necessary to produce such an ideal material as beeswax within their own bodies?

Assume for a moment that bees somehow managed to generate beeswax, the raw material for their combs. But that success has no meaning in isolation, because at the same time, the bee must also possess all the technical knowledge and competence for the construction work it will perform.

Also assume—no matter how impossible this may actually be—that by chance, a bee did come into possession of all these attributes. That is still not enough. The bee in question would also need to teach its knowledge to the other members of the colony, which must form the necessary systems for producing beeswax in their own bodies. Moreover, that bee also has to transmit this information and system of production to subsequent generations.

In addition, bees must also know about division of labor that lets them all work together. It is not enough for every bee to possess the knowledge and competence to construct combs; they also need the conscious intelligence with which to establish the requisite organization. Such questions



**Producing wax is a rather difficult, laborious process. Honeybees extract it from their wax glands in pieces no larger than a pinhead. The photos show bees making honeycombs.**



as how bees carry out that organization—and how communication is established among them and how it is that no confusion ever emerges among the tens of thousands of bees in the dark hive—still need to be answered.

All rational people need to employ their conscience and ponder the conditions set out in general terms above. It's of course not possible for an insect like the bee to have come into possession of the necessary attributes for making combs, and using these in the most advantageous manner, entirely by chance. This extraordinary construction ability is compatible neither with the size of the bee, nor with its brain capacity, nor with its reason and consciousness.

Let us consider the bees' abilities by comparing them with man's. Could a person possessing reason and intelligence create a new secretion that would be of benefit, in his own body, of his own will? Could he, for instance, design a new system that allows the saliva glands inside his body to produce glue? Everyone realizes that such a feat is quite out of the question. Is it therefore reasonable to expect a bee to be able to do what human beings cannot?

Neither the bee nor any other living thing on Earth can add new organs to its body at will, nor make them produce entirely new secretions. The physical structures and miraculous abilities in bees clearly prove that they were brought into existence by a Creator. Like all other living things on Earth, bees were created by God, Who manifests peerless examples of His intellect in bees, in order that humans should think about and learn from them. God is All-Powerful. A rational person's responsibility is to listen to his conscience, turn to God, our Creator, in all that he does, and to lead his life in the light of His commands:

**Say: "Who provides for you out of heaven and Earth? Who controls hearing and sight? Who brings forth the living from the dead and the dead from the living? Who directs the whole affair?" They will say, "God." Say, "So will you not guard against evil?" (Surah Yunus: 31)**

## How are the Dimensions of the Identical Cells Comprising the Comb Established?

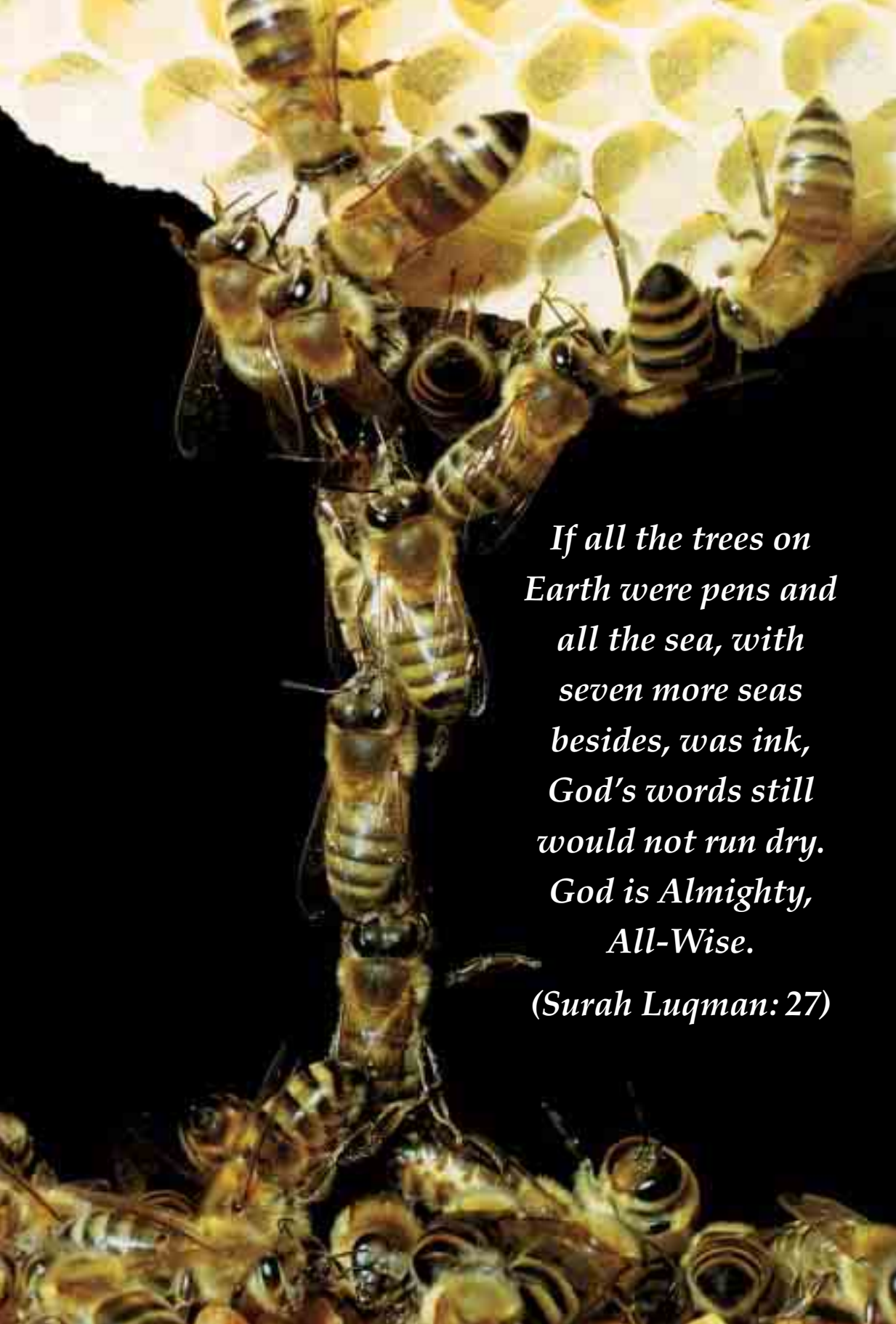
The construction of the comb is a miracle all by itself. The combs consist of identical, exceptionally regular hexagonal cells, and offer yet another indication of the superior intelligence manifested in bees.

Bees begin constructing a comb from the top and work downwards from two or three different spots. The construction of the comb widens out towards both sides and joins to the other two rows. This work is performed in such a harmonious and regular manner, in fact, that it is impossible to tell where the three different parts join together. The pieces of the comb built from separate starting points are so regular that, despite consisting of hundreds of cells and having hundreds of angles, they look like one single structure. No joins can be seen. This reveals that bees do not set about this task randomly, but calculate the distances between their starting and end points beforehand. The width of the cells for honey, pollen and larvae is also standardized at from 5.2 to 5.4 millimeters (0.20 to 0.21 inch). Only the cells for male bees are larger, at 6.2 to 6.4 millimeters (0.24 to 0.25 inch).<sup>128</sup>

A bee measures the width and thickness of the comb cells thanks to its sensitive receptor hairs (sensilla trichodea), which are concentrated mainly on the mouth and antennae. It has been established that on one single bee's antenna, there are about 8,500 sensilla trichodea and some 500,000 receptor cells.<sup>129</sup> Using these hairs, the bee measures the thickness of the cell walls she makes. In making these calculations, she behaves exceedingly carefully. A bee adding wax to a cell constantly pushes the wall, determining its elasticity and thickness according to its movement. As a result of all these processes, a miraculous situation transpires. The thickness of the comb wall built by all the bees is 0.07 millimeters (0.0028 inch), and deviates from this by only 0.002 millimeter (two-thousandths of a millimeter).<sup>130</sup>

**No seams can be seen in the comb. It is as if these cells were produced in a single sheet. This is most astonishing, because in fact a large number of bees start from different points, making separate series of cells.**

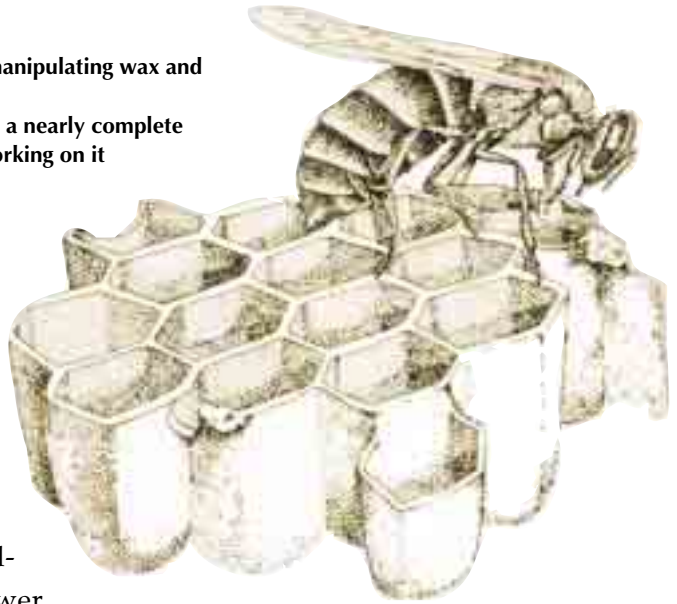




*If all the trees on  
Earth were pens and  
all the sea, with  
seven more seas  
besides, was ink,  
God's words still  
would not run dry.  
God is Almighty,  
All-Wise.*

*(Surah Luqman: 27)*

**Right: A worker bee manipulating wax and building cells**  
**Below: A section from a nearly complete comb and the bees working on it**



The way the comb cells are joined together is also of great interest. Bees start on the next one even before they have finished building one cell. Construction of new adjoining cells begins lower

down while the lateral walls of the first cells are being added. As construction of the comb continues, new bees also become involved in this process. Interestingly, every bee that takes part in subsequent comb building immediately realizes what stage the construction has already reached, and knows where to begin.

After the comb cell has been shaped and brought to its final form, the bees complete the process, hardening the wax with another regurgitated liquid. This leads to the completion of the combs' identical, flawless hexagons. However, the number of cells constructed by bees is very large. For example, in order to store 9.9 kilogram (22 pounds) of honey, bees need to build a comb of 35,000 cells.<sup>131</sup>

As can be seen from all this information so far, there is a literal perfection in the comb,



both during its construction and also in general terms. Even the design of the comb's external edges is quite amazing. Bees use hexagons for the comb's cover, trapezoids for the lateral walls, and equilateral rhombs for the base. They make the comb stronger by putting the base of one cell among the base of the three cells on the opposite side of the comb.

### **Bees' Comb-Building is Incomparable**

The more scientists studied the world of bees, the more it astonished them. They were amazed by the calculations regarding such geometric shapes as the hexagon, trapezoid and rhomb, and the way that the bees so flawlessly completed such details as to where in the comb these are to be found. Murray Hoyt, author of one of the most important works written on the subject, *The World of Bees*, sums up the construction of the combs in these terms:

It is completely incredible that, with thousands of bees coming up and adding their bit of wax to the spot where the "drawing out" is going on, you don't get a thousand different variations of shape and thickness. You're led to the conclusion that every one of these thousands of insects in her own right must be a trained engineer.

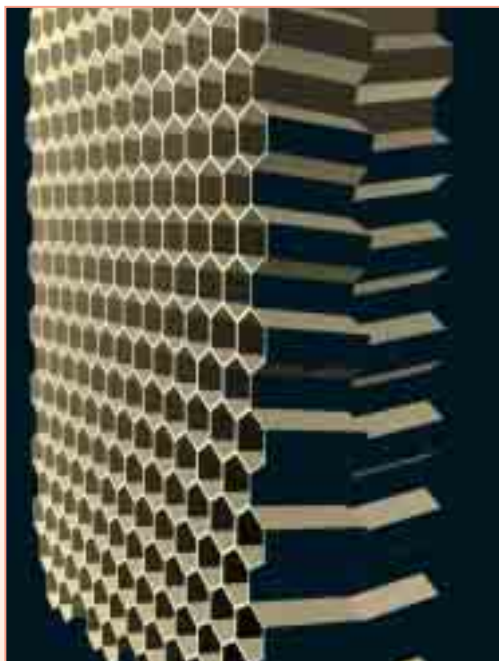
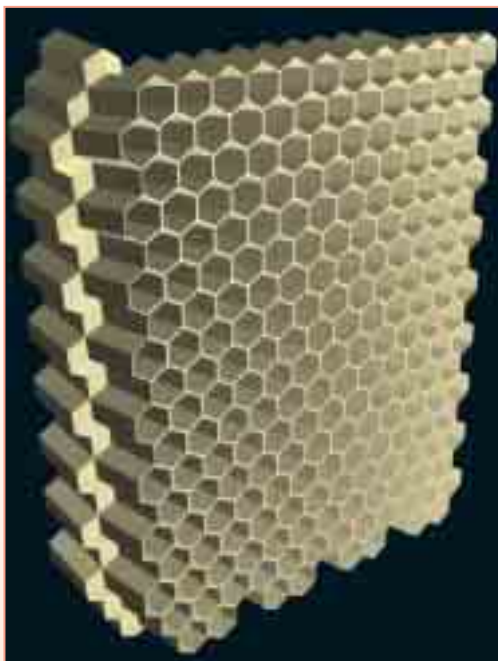
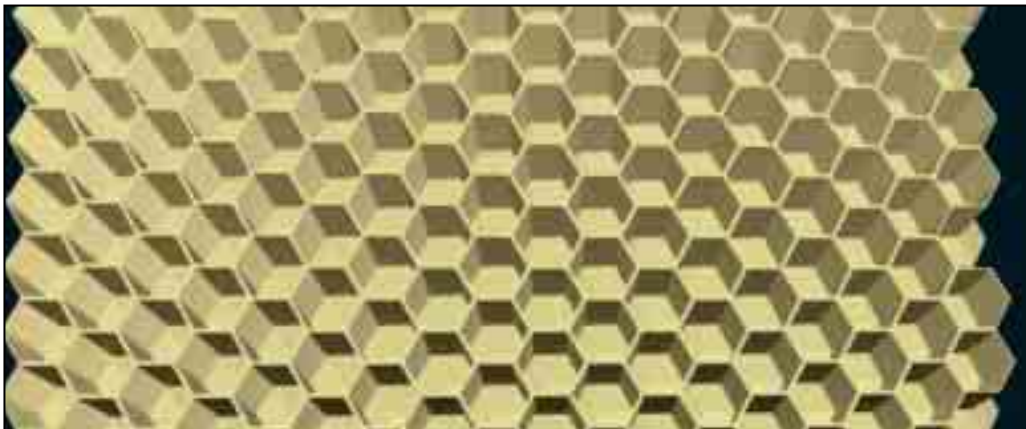
Each bee adds only a tiny part to a given area of comb. Yet each cell ends up the same size and shape as all the others. From the apparent disorganization and haphazard chaos of work on the combs comes the perfection of uniformity. When you see the work going on it even looks as if each bee constitutes herself an inspection party of one. She looks the work over, gives it a pat here and there and goes on about her business. With thousands of bees doing this, you somehow get that perfect finished product.<sup>132</sup>

The above statements are most thought-provoking. It is exceedingly difficult for a human to draw regular geometrical shapes in the absence of such implements as a ruler and set square. It is quite impossible to get the 120-degree internal angles of a hexagon right, as bees manage to do—in near-total darkness.



## **THE PERFECT MEASUREMENTS IN THE COMB**

The picture above shows a comb made by honeybees out of perfectly hexagonal cells. The illustrations on the next page are three-dimensional computer images of honeycombs. In order to obtain the images of the comb, an expert in the field employed computer programs capable of producing drawings by calculating the various angles. However, bees use no such equipment in making their equally perfect combs. The importance of their success becomes more apparent when we compare the picture and the drawings of the combs. How is it that bees have been able to construct combs of this same perfection for millions of years? Bees have no ability to calculate angles; neither have they any knowledge of geometrical shapes. It is God, Who created the entire universe, Who inspires in bees the knowledge and ability with which they can build their combs.



The three-dimensional drawings above were made by imitating bee combs. As can be seen, no matter from what angle one looks at the combs, they still appear perfect and regular.

*In the creation of the heavens and Earth, and the alternation of the night and day, and the ships which sail the seas to people's benefit, and the water which God sends down from the sky—by which He brings the earth to life when it was dead and scatters about in it creatures of every kind—and the varying direction of the winds, and the clouds subservient between heaven and earth, there are signs for people who use their intellect. (Surat al-Baqara: 164)*

**The drawing below shows the back-to-back structure of the combs and the angles in them. Every single one of the bees making a comb constructs cells by calculating these angles.**



Moreover, the shapes we draw on paper are two-dimensional. Yet bees produce three-dimensional hexagonal prisms. They perform very delicate calculations during the construction of these three-dimensional prisms, as regards the walls' thickness and elasticity. In addition, since the comb has two faces, there is a problem of joining the cells on both sides at the bottom. Furthermore, all the cells are built at an incline of 13 degrees in order to keep the honey from flowing out.<sup>133</sup> Beyond all this—as we have shown—the comb's structure forms through the

bringing together of separate components. In other words, the comb does not start with a single part and grow as that part expands. Parts produced separately by the bees are added on to the extremities. Yet at the same time, no trace remains of the joins between the comb sections produced in different areas. The hexagons at the intersections are not half-formed or of different dimensions, so no problem emerges of cells being of a different height or mutually incompatible. Bees join the cells together so perfectly that it is impossible to identify where they have been joined together.

Why don't bees start comb construction from a single side only? Were they to do so, construction would take much longer. Since the area under construction would be limited, new bees could join in the work only as new cells were added. Yet when work begins with all the bees starting from several sides, the comb is completed much more quickly, since more bees can engage in the work.

As we have seen, there is an enormous amount of detail in the making of

the combs. Clearly, the comb is a special structure, and it is nonsensical to imagine that it could have come into being by chance. Every stage in the life of bees is a manifestation of the infinite might and creative artistry of God.

## Bees' Unbelievable Calculations

To better understand the miraculous nature of what bees do, imagine that you have a number of bricks of exactly the same dimensions. It will be easy enough for you, working together with a friend, to lay these out in a straight line, building from opposite ends at once. There is a likelihood, however, that when you reach the middle, there will be a gap left over, smaller than the size of any single brick. This you can resolve by breaking one of the bricks and filling in the gap.

But assume that you want to do this the way bees do in building their combs—without breaking any bricks, apart from those at the extremities. (Bees only use half-hexagons at the comb edges, because of the hexagon's geometric form.) What will you do then? In other words, you are allowed to break the bricks only at the ends, in the same way that bees do with their hexagons. You have to use the rest of the bricks whole, again in the same way as bees.

In order to do this, you'll need to make some calculations. You cannot succeed if you simply go about the task randomly. Several preliminary steps will be necessary for success, including:

- You have to get a tape measure and measure the length of the line.
- You must then measure the length of one of the bricks.
- You must divide the length of the line by that of one brick. If the length of the line is not an exact multiple of that of the brick, then the result you obtain will not be a whole number.
- That portion of the number following after the decimal point is of the greatest importance,

**The kingdom of the heavens and the earth and everything between them belongs to God. He creates whatever He wills. God has power over all things. (Surat al-Ma'ida: 17)**

because this will show by how much the two bricks at the end need to be shortened. For example, if this value is 0.25, then the total length of the bricks at the ends must not exceed 0.25. You can make the necessary adjustment according to whatever figure you obtain.

- After shortening the two end bricks according to that figure, you can then lay all the others in place. When you reach the middle, the final brick should fit perfectly—that is, of course, as long as you've done all the calculations correctly!

This analogy shows that for a human, success is possible only by carrying out a number of calculations and using various pieces of measuring equipment.

Let us now consider the calculations performed by bees, which are far more complicated than those in our example of the bricks, and which employ no measuring equipment at all.

Remember that bees do not draw lines on a flat field or line bricks up together, but add equal-sized hexagons to one another. Bees are insects with a 0.74 cubic millimeter brain and weighing between 80 and 100 milligrams (0.00017 and 0.00022 of a pound).<sup>134</sup> In addition, they perform calculations of which only human beings are capable, and manage mathematical feats that even we humans would sometimes find difficult, to make equal-sized hexagons. Bees are capable of all these calculations and measurements as they build their honeycombs, which they accomplish by acting in complete harmony together.

The width of the cells which bees make out of wax is always between 5.2 and 5.4 millimeters (0.20 to 0.21 inches). In order to squeeze the cell into a limited space with no problems arising, the width of the semi-hexagonal cells at the extremities is of great importance. If the cells at both (and sometimes also the third) edges are slightly too wide or too narrow, then there will be faulty connections where the parts of the comb are joined at the middle. An important point here needs to be borne in mind: Even if the job is started by making perfect calculations, if one group of bees starts slightly above or below the others, then by the time they reach each other, the rows of cells will be slightly out of line and it will be im-



possible to join them together. And if the middle group of bees allows their part of the comb to slip slightly to the left or right, then it will be unable to join up properly with those on the left and right.

To return to our earlier brick-laying analogy, if a third person joins in the work when the first two have started laying bricks from the two ends, and if this person also begins laying bricks on the line, then confusion is clearly likely to result. In this case, the location of the first brick laid by that individual needs to be precisely calculated. If it's placed incorrectly, there will be gaps on either side of it.

Yet with bees, no such error ever occurs. Where the parts of the comb join together are never visible. No matter how many bees work on the task, they all work together in the most astonishing harmony, just as if each one were a construction engineer.

### **Could You Make a Regular Comb Using Just a Pencil?**

Perform a simple experiment to examine the task that bees perform with another example. Start drawing hexagons on a piece of paper, trying to bring them all together in the middle of the page. However, you must try to ensure that no gaps are left between the hexagons, and none of the hexagons are irregular. Most importantly, do this without using such equipment as a compass and set square, and without making any calculations. You will find this very difficult, if not impossible. Imagine three or four people starting from different points on the same piece of paper, and you can see how difficult the task really is.

If you make a mistake, however, you can always erase it and start again. Yet bees have no such similar opportunity. They make their honeycombs in one go, making no mistakes at all.

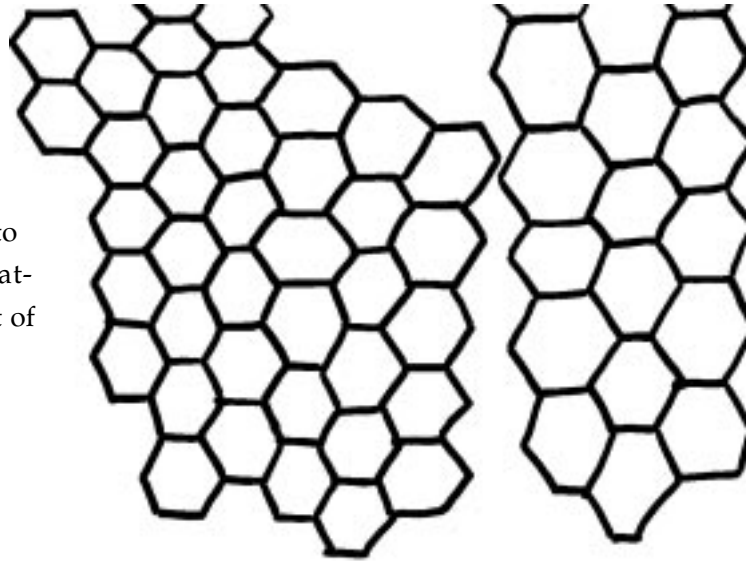
As you can see from these examples, it is exceedingly difficult for a bee to make equally perfect hexagons and then join these together to produce the comb. Furthermore, the miracles in the perfect honeycombs that bees have been constructing since they first came into existence do not end here.

## Angles in the Honeycomb

In constructing their cells, bees need to bear in mind three separate angles:

- The internal angles of each comb cell.
- The upward angle of the cell from the horizontal.
- The angles of the equilateral rhombs in the cell's base.

Bees construct their cells by perfectly maintaining the necessary  $120^\circ$  internal angles in the hexagons. During construction, another point to which bees pay careful attention is the angle of tilt of



**It is impossible for a human being to draw regular hexagons with a pencil and then to join them together without leaving any traces. Yet bees have been doing exactly this, in three dimensions, for millions of years.**



the cells. If they were built exactly level to the ground, the honey placed in them would run out. The cells are raised from base to opening at an angle of 13 degrees, thus preventing them being parallel to the ground.<sup>135</sup>

The third angle that bees employ is the angle that connects the cell bases. This has been a subject of debate among scientists, and it has been the bees who won.

### **A Victory for Bees over Scientists: Perfect Tilt Calculation**

As you've seen, bees make their combs double-faced. The hexagonal cells are joined to the cells on the other side at the base. Yet the joinings between the two series of comb cells are a particular marvel of engineering.

The first noticeable feature in this design is the three equilateral rhombs at the bottom of the hexagonal cell. Every comb cell is designed in such a way as to be placed at the juncture of the three cells directly on the opposite side of the comb. This mutually interconnected structure gives the honeycomb maximum resilience. Just like riveted steel clamps, the cells that join at the base can be said to be welded to one another.

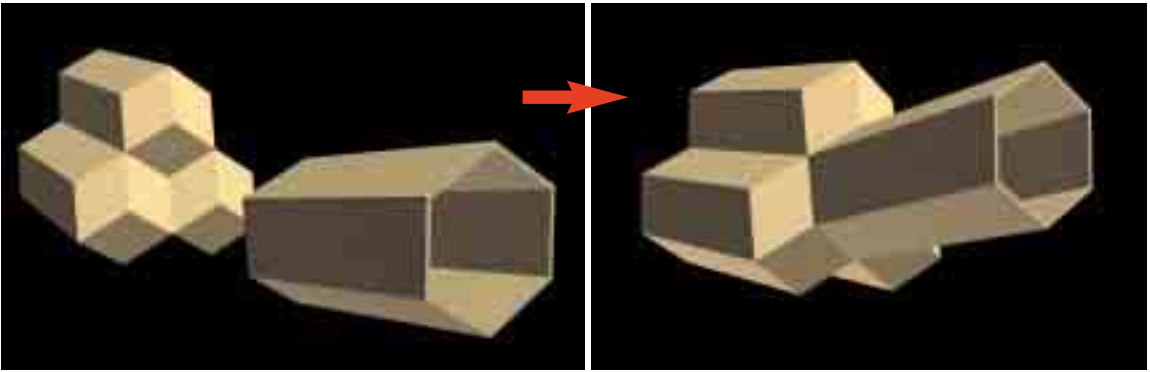
Scientists examining the honeycomb's flawless structure have been amazed at the mathematical calculations performed in such a way that the bases of three cells form the base of a single cell facing in the opposite direction. This is a design which requires the most complicated mathematical foresight.

Scientists performing this calculation in a way similar to what bees must do revealed the very sensitive angles needed to achieve these qualities. According to a calculation by the well-known mathematician Konig, the angles at the base must be 109 degrees 26 minutes and 70 degrees 34 minutes for the most perfect structure.

What angles do the bees use? Observations have shown that in the construction of the honeycomb, they use two exact angles: 109 degrees 28 minutes and 70 de-



**Viewed from above, a comb's cell can be seen to be made from a combination of three equilateral rhombs.**



When three comb cells, whose bases consist of equilateral rhombs, are joined together, the base of a cell on the opposite side emerges. In this way, the two faces of the comb are locked together, constituting one single, solid structure. The angles of these rhombs made by the bees are literally perfect and flawless.

grees 32 minutes, and that they never deviate from these. This is quite unbelievable! Bees succeed in resolving a mathematical calculation beyond the reach of all but an expert.



However, the calculation performed by bees exhibits a deviation of  $1/30$ th of a degree. (One degree consists of 60 minutes. The 2-minute difference in the angle in the comb corresponds to  $1/30$ th of a degree). In other words, bees include a margin of error in their combs, even if this is so small as to be insignificant.

Indeed, on account of this error of  $1/30$ th of a degree, scientists once thought that bees were unable to achieve a perfect result and only approached the exact angle, allowing themselves a margin of error. But the fact is, bees actually make no error at all!

The famous Scottish mathematician Colin Maclaurin (1698-1746) repeated the same calculation, and when he announced his result, it stunned the world of science. Maclaurin had revealed that the angle employed by bees was totally exact, and that Konig and his team who had carried out the first study of the honeycomb had arrived at a faulty result, due to an error in the logarithmic tables they had used.

In short, it was realized that there is not the slightest error in the honeycombs.<sup>136</sup> The so-called  $1/30$ th of a degree error was made by scientists, not by bees.

## Why the Hexagon?

As we have seen, honeycombs are based on calculations so delicate that most human beings cannot manage them, and that these features make them architectural marvels that amaze scientists.

Scientists researching the structure of the honeycomb carried out detailed studies on the question of why bees did not construct them randomly, or else in an octagonal, pentagonal or triangular form rather than the hexagonal.

Karl von Frisch, author of the book *Animal Architecture* and one of the

### WHAT DID CHARLES DARWIN SAY ABOUT THE HONEYBEE?



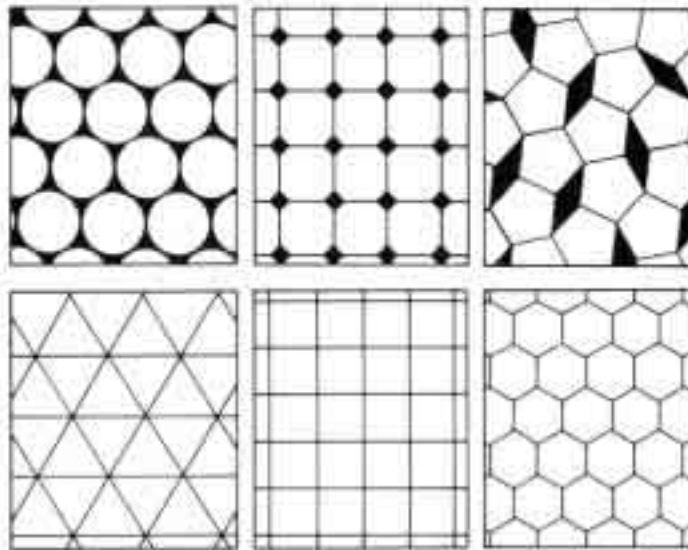
Darwin was stung into silence by these little creatures, asking, "*What shall we say concerning the honeybee...?*"

That bees make their cells in perfect hexagonal forms, sparrows build their nests with straw (left), beavers build dams (right), and rabbits dig burrows in the ground, are all proofs of God's creation of separate species. Such animals behaviors are signs



of the existence of God, Who created the universe and all life forms flawlessly.

G. Mansfield, "*Creation or Change? God's purpose with mankind proved by the wonder of the universe,*" Logos Publications



When hexagonal cells and cells in other geometric shapes are compared, it appears the hexagonal cells have an obvious advantage in terms of utilization of area per unit volume. The hexagon can store the largest volume with the least amount of construction material.



world's most respected authorities on bees, answers this question in these terms:

If the cells were round or, say octagonal or pentagonal, there would be empty spaces between them. This would not only mean a poor utilization of space; it would also compel the bees to build separate walls for all or part of each cell, and entail a great waste of material.

These difficulties are avoided by the use of triangles, squares, and hexagons. Provided their depth was the same, such cells would therefore hold the same volume. But of the three geometrical figures equal in area, the hexagonal has the smallest circumference. This means, of course, that the amount of building material required for cells of the same capacity is the least in the hexagonal construction, and hence that such a pattern is the most economical design for warehouses.<sup>137</sup>

In the above extract, von Frisch openly answers the question "Why the hexagon?" Yet the question which really needs answering is how bees discovered it. Common sense is enough to deduce that this flawless structure could not have been developed by bees during any imaginary process of evolution. Constructing a scenario in which the bee one day constructed a pentagonal cell, then tried a triangular one on a following day, continuing

*Praise be to God, to Whom everything in  
the heavens and everything in the earth  
belongs, and praise be to Him in the  
Hereafter. He is the All-Wise, the All-Aware.  
(Surah Saba': 1)*



in this vein for some time, before deciding years—or hundreds of years—later, that the hexagon was the most ideal form, is quite nonsensical. To claim such a thing is to suggest that bees possess as much reason and consciousness as human beings. Neither reason nor conscience permit such a claim to be believed.

Bees were created by God. They underwent no evolutionary process. They never underwent any change. The moment they were first created, they had exactly the same features as they possess now.

## Conclusion

As we have seen throughout this book, most of the tasks performed by bees are quite astonishing to human beings. During their brief life spans of only a few weeks, bees perform all the jobs in the hive in a specific order. From caring for the young to construction, from food gathering to honey production, they succeed at every one.

The bee's nervous system, which enables all these jobs, consists of around 7,000 neurons. A human being has some 2 million times that number.<sup>138</sup> Yet as we have seen in some considerable detail, bees are able to carry out all these tasks to perfection:

- They perform a series of complicated tasks in the hive, such as feeding the larvae, cleaning, air conditioning, maintenance and repair.

- They are able to distinguish between friendly and hostile bees.

- They are able to give directions according to the angle of the Sun.

- They are able to perceive ultraviolet rays.

- They are able to calculate the weight of the pollen they are carrying.

- They are able to carry out in-flight corrections to their course by looking at the brightness of the sky and landmarks and perceiving odors along their route.

- They are able to calculate the distance they have covered in flight.

- They can measure the frequency of the movements in the dance performed in the hive and thus calculate the distance of the food source.

- Even though the dance takes place in a vertical plane, they are able to



accurately calculate the angle between the Sun and the food source.

-They are able to build exceptionally regular hexagonal comb cells.

However, regarding these creatures which are capable of performing all these tasks, it will be useful to emphasize one particular point: The total number of nerve cells in the bee brain is a great smaller than the number of nerve cells that a human being uses to speak the Latin name for honeybee, *Apis mellifica*.<sup>139</sup> A bee's brain is just 0.74 cubic millimeters in size.<sup>140</sup> Furthermore, despite her larger body, the brain of the queen bee—the most crucial individual in the whole hive—is even smaller: just 0.71 cubic millimeters. The conclusion that emerges from all these statistics is that the sophisticated work done by bees has no correlation with the size of their brains. All of these flawless attributes have been given to them.

Who gave bees all these extraordinary characteristics? How did these creatures, which can perform calculations impossible for human beings and have been equipped with so many features, come into existence? How is it that as soon as these insects emerge from their cocoons, they are able to perform such unbelievable tasks, without the benefit of any special training? How are these unthinking creatures able to establish such an organizational structure? Moreover, how is it that they all fulfill their duties within such a communal order? The organization among them is so perfect that it can only be the work of a superior intelligence.

As we consider all these questions, one truth emerges: It is Almighty God Who gave bees all these astonishing characteristics. As He does in all the living things He has created, in bees God reveals His infinite wisdom and incomparable creation. A person who witnesses this creation must praise God, the Lord of all, and submit to Him.

**. . . There is no creature He does not hold by the forelock. My Lord is on a Straight Path. (Surah Hud: 56)**



# THE MIRACLE OF HONEY

*... From the contents of their bellies, from between the  
dung and blood, We give you pure milk to drink, easy for  
drinkers to swallow. (Surat an-Nahl: 66)*

**B**y making honey, bees have served humanity since very ancient times. Beekeeping goes as far back as 3500 BCE.<sup>141</sup>

## **The Production of Honey**

As you know, the main ingredient in honey is the nectar collected by bees from flowers and fruit buds. Bees turn this into honey. Pollen has no effect on the production of honey, and is used by bees only to meet their needs for protein.

The nectar a bee collects from flowers and swallows undergoes a chemical change in its honey stomach, where it becomes a heavy, sugary liquid rich in vitamins and minerals. Later, bees place it into the honeycomb cells and seal with a wax cover. The honey acquires its familiar taste and consistency in the comb, thanks to the special air-conditioning provided by the bees.<sup>142</sup>

The color of honey, its sugar content and different flavors all stem from the original nectars collected. The aromatic volatile oils in flowers, those same oils that give flowers their scents, give the honey its aroma.

Honey production requires a major effort. For example, it takes 900 bees working an entire day to collect half a kilogram of raw nectar, only part of which can be turned into honey. The amount of honey obtained from the flowers totally depends upon the sugar concentration of the nectar brought to the hive. In the apple blossom, for instance, there is little sugar, and so little of the nectar collected from apple trees can be turned into honey.<sup>143</sup>

In order to obtain 450 grams of pure honey, some 17,000 bees must visit 10 million flowers. An average expedition to find food requires that a bee visit some 500 flowers and on a journey lasting approximately 25 minutes. That explains why bees have to put in 7,000 work hours to obtain 450 grams of pure honey.<sup>144</sup>

Although this job is most demanding, bees create many times more

### HOW DO BEES FEED IN WINTER?

Bees store honey for use in winter. The amount of honey to be produced depends on the flower sources. Even if they collect enough honey for the needs of the colony a month before the flowers fade, they still do not neglect to gather more nectar, and try to store as much honey as possible, even if it requires to increase the volume of the comb.

Beekeepers remove from the hive only a portion of the honey-filled combs, because the bees will need some of the honey to consume during the winter. If bee-keepers do take away most of the honey, they feed the bees with sugar water during the winter. The only exception is in the very coldest days, when sugar water is not enough. At these times, the bees must be given honey.

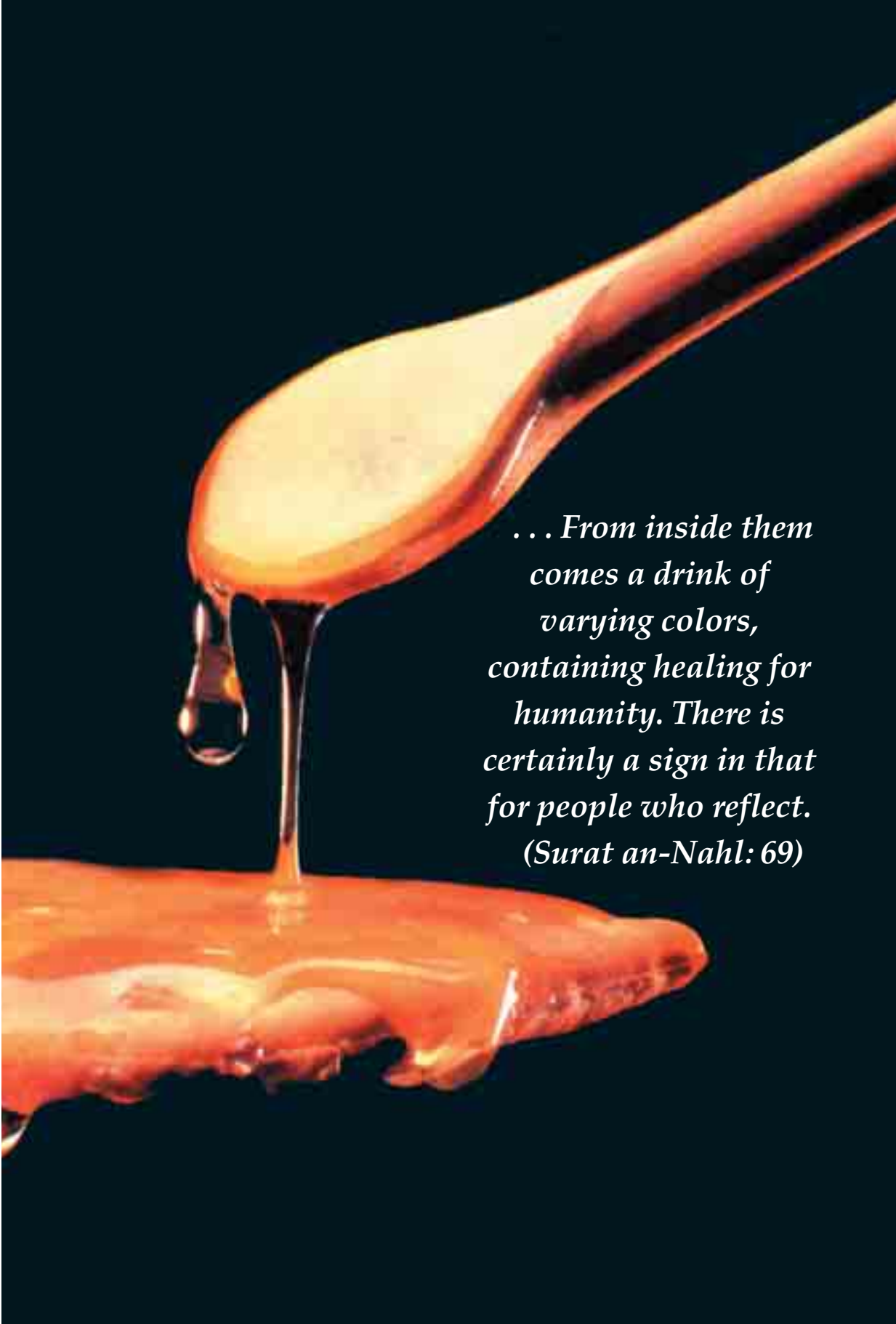
honey than they need. No doubt, this is a blessing from God for human beings' benefit.

### The Contents of Honey

The reason for honey's sweet taste, the first characteristic that comes to mind, is the three different sugars in honey: dextrose (34%), sucrose (2%) and levulose or fructose (40%).

In addition, 17% of honey is water. The remaining 7% consists of iron, lime, sodium, sulphur, magnesium, phosphorus, pollen, manganese, aluminum, calcium, copper, albumen, dextrine, nitrogen, and traces of other substances besides protein and acids. It is this 7% of the mixture that determines the quality of the honey.<sup>145</sup>

There is one very important difference between honey and the ordinary cane sugar with which we are all familiar. Sugar enters the bloodstream only after undergoing changes in the digestive system, while



*... From inside them  
comes a drink of  
varying colors,  
containing healing for  
humanity. There is  
certainly a sign in that  
for people who reflect.  
(Surat an-Nahl: 69)*

honey can enter it immediately, with no need to be digested first. In short, honey is a food that has been specially created in such a way that human beings can benefit from it at the highest level and in the most rapid manner. It has been established that honey mixed with warm water supplies energy to the body in a matter of minutes.

### **Health-Giving Properties of Honey**

With the vitamins and minerals it contains, and with its other characteristics, honey is a healthy food, as is emphasized in the Qur'an:

**Your Lord revealed to the bees: "Build dwellings in the mountains and the trees, and also in the structures which men erect. Then eat from every kind of fruit and travel the paths of your Lord, which have been made easy for you to follow." From inside them comes a drink of varying colors, containing healing for mankind. There is certainly a sign in that for people who reflect. (Surat an-Nahl: 68-69)**

One of honey's most important features is that it harbors no bacteria. Honey's high sugar content is great for absorbing moisture, which makes it difficult for bacteria to survive. Another blow for microorganisms is propolis, which is found in the nectar of some honey and can actually kill bacteria.<sup>146</sup>

For this reason, not only does honey not harbor bacteria, but it can be used as an anti-bacterial. For example, it has been established that the bacterium MRSA, which is resistant to antibiotics, is not resistant to honey.<sup>147</sup>

Using only honey, Dr. W. Sackett destroyed all the typhoid fever germs in 48 hours. Dysentery germs died within 10 hours.<sup>148</sup>

As can be seen from the above, honey is a most powerful health-giving food. This feature, only recently established for certain, was mentioned in the Qur'an 1,400 years ago. There is no doubt that this is one of the miracles revealed in the Qur'an by Almighty God.

Along with its minerals, sugars and many vitamins, honey also contains small quantities of various hormones, zinc, copper and iodine. The next page displays a chemical analysis of the contents of 100 grams of honey.

<b>NUTRIENT</b>	<b>Average amount in 100 grams of honey</b>
Energy	304.0 kilocalories
Water	17.1 gram
Carbohydrates (total)	82.4 gram
Fructose	38.5 gram
Glucose	31.0 gram
Maltose	7.20 gram
Sucrose	1.50 gram
Proteins, amino acids, vitamins and minerals (total)	0.50 g
Thiamine	<0.006 milligram
Riboflavin	< 0.06 milligram
Niacin	< 0.36 milligram
Pantothenic acid	< 0.11 milligram
Pyridoxine (B <sup>6</sup> )	< 0.32 milligram
Ascorbic acid (C)	2.2-2.4 milligram
<b>Minerals</b>	
Calcium	4.4-9.20 milligram
Copper	0.003-0.10 milligram
Iron	0.06-1.5 milligram
Magnesium	1.2-3.50 milligram
Manganese	0.02-0.4 milligram
Phosphorus	1.9-6.30 milligram
Potassium	13.2-16.8 milligram
Sodium	0.0-7.60 milligram
Zinc	0.03-0.4 milligram
Acid (particularly gluconic acid)	0.57 % (0.17-1.17 %)
Protein	0.266 %
Nitrogen	0.043 %
Amino acids	0.05-0.1 %

**Reference:** [www.honey-well.com/composit.html](http://www.honey-well.com/composit.html)

## **A Matchless Food: Bee Pollen**

As already stated, bees do not directly use the pollen they collect from flowers, but turn it into another product known as "bee pollen." This

transformation is carried out by adding nectar and various enzymes to the pollens collected.

This product made by bees contains every nutrient we humans need. Bee pollen consists of 25% vegetable protein. (18 amino-acids, of which 8 are basic amino-acids.) It also contains more than another dozen vitamins, 28 minerals, 11 enzymes and helper enzymes and 11 carbohydrates. This makes bee pollen far more than just another food.

Ever since the 1950s, there has been a lot of research on bee pollen, revealing—among other things—that it contains antibiotic substances effective against colon bacillus and some strains of Salmonella (a genus of bacteria), as well as providing nutritional and metabolic benefits.<sup>149</sup>

Nutritionist Dr. Paavo Airola is full of praise for bee pollen:

Multi-source bee pollen is the richest and most complete food in nature. It increases the body's resistance to stress and disease and also speeds up the healing process in most conditions of ill health . . . .<sup>150</sup>

The Russians have also attached great importance to the properties of bee pollen. Dr. Naum Petrovich Joirich, chief scientist at the Longevity Academy in Vladivostock, says:

Bee pollen is one of the original treasure houses of nutrition and medicine. Each grain contains every important substance necessary to life.<sup>151</sup>

The enhancement of physical performance has also been linked to bee pollen. Carlson Wade in his book *Bee Pollen and Your Health* and Lynda Lyngheim and Jack Scagnetti in their book *Bee Pollen* also refer to the way that this substance has strengthened athletes.<sup>152</sup>



## Royal Jelly

Since royal jelly contains some very complex and as-yet undefined compounds, it has been impossible to manufacture it artificially. It is rich in natural hormones, minerals, Vitamin B, folic acid, fatty acids, acetylcholine (the lack of which in the body causes Parkinson's disease, Alzheimer's and other diseases of the nervous system), amino-acids, proteins, fats and carbohydrates. It also contains aspartic acid, which plays an



important role in the renewal and growth of soft tissues in the body.

Royal jelly possesses antibacterial, antiviral, nutritional and anti-aging properties, helping with cell renewal as people grow older. In addition, it also benefits the respiratory, skeletal, nervous, endocrine, cardiovascular, immune and cellular systems. It also stimulates hormone balance, regulates and normalizes hormonal and metabolic functions. Along with treating skin problems, it also protects skin color.

It helps the body regain strength in the wake of chronic fatigue, serious illnesses, operations and trauma, and also raises energy levels. It lowers cholesterol and fat levels and helps prevent hardening of the arteries. Research has also indicated that royal jelly is useful in protecting the liver, building bone and muscle, supporting bone growth and health, strengthening the memory, weight stabilization and the treatment of injuries.

Doctors in Germany carrying out research in a number of fields used royal jelly to feed malnourished and premature babies. Improvements in the weight and health of babies fed on royal jelly were observed.

In addition, it has been observed that patients with nervous and psychological problems given royal jelly achieved a normal weight, more resistant nervous systems and stronger physical and mental structures.

Doctors also advise the use of royal jelly to delay the effects of aging and menopause, to relieve malnourishment and illnesses such as joint infections, diseases of the arteries, peptic ulcers and liver problems, as well as for general health.<sup>153</sup>



# CONCLUSION: THE FACT OF CREATION

*Don't you see that everyone in the heavens and everyone on the Earth prostrates to God, and the sun and moon and stars and the mountains, trees and beasts and many of humanity? . . .*

*(Surat al-Hajj: 18)*

**T**hroughout this book, we have examined a great many features of honeybees and answered the question of how the bees' perfect systems, their intelligent behavior, and such abilities as calculation, planning and construction came into being. We have also shown in some detail how the mechanisms proposed by evolutionists are invalid by citing examples from the life cycle of bees and the mechanisms they possess. Most important of all, a truth has again been revealed that everyone who uses common sense can clearly see.

In order to perceive this truth, let us try to find the answer to the question of how the first bee lived. Let us also see that it is impossible for evolutionists to provide a consistent answer on this subject.

As we know, evolutionists maintain that all living things are descended from one single ancestor as the result of chance. In fact, this claim has totally collapsed. (For details see the appendix "The Deception of Evolution".) However, let us for the moment assume that the first bee did in fact come into existence by chance. In order for this bee's line to survive there must have been a female—or to be more accurate, a queen. Yet the queen is unable to find her own food; as we know, the workers feed her with special royal jelly. That is the only way her ability to lay eggs comes about. That being so, any queen that's unable to feed herself or lay eggs will be unable to continue her line. Moreover, a queen by herself is not enough, she also needs a male to fertilize her.

In the same way, let us also assume that a queen bee and a male came into existence by chance—the chances of which are, in fact, zero. Imagine that the queen starts laying eggs after being fertilized. But the queen cannot make honeycombs, since she lacks that particular ability. She cannot lay her eggs just anywhere, because the larvae that hatch out cannot survive unprotected. Neither can the queen provide food for the larval bees, since she is unable to leave her nest to gather pollen or nectar and lacks the organs with which honey is generated. It is thus inevitable that the larvae will die soon after they hatch.

In conclusion, it is evidently quite impossible for a honeybee to come

*He [God] is Lord of the heavens and the earth and everything in between them, so worship Him and persevere in His worship. Do you know of any other with His Name?*

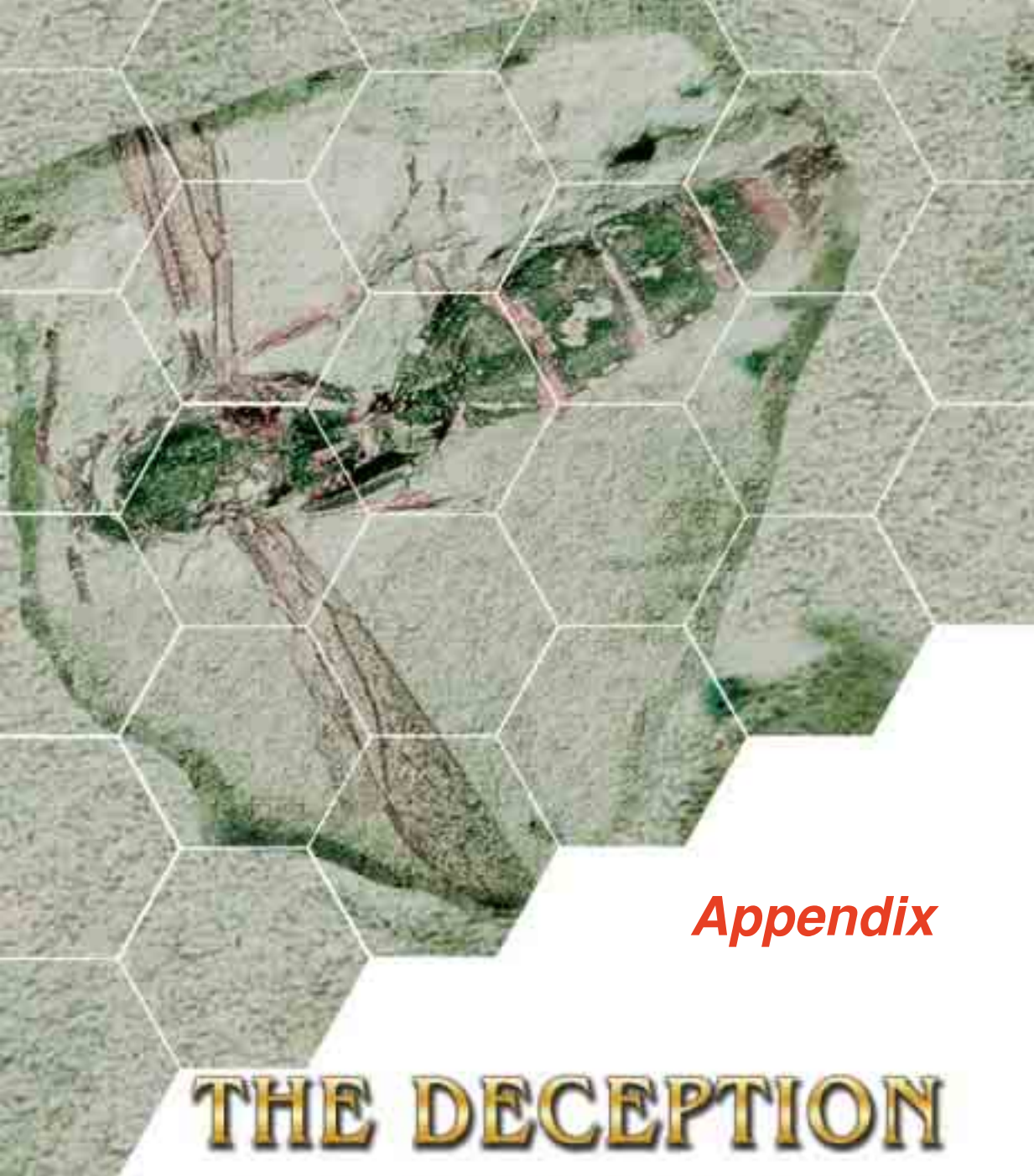
*(Surah Maryam: 65)*



into being by chance and then to survive. That being the case, evolutionary scenarios based on chance have absolutely no validity. In other words, the characteristics of only one single living thing are enough to invalidate the theory of evolution. Merely the examples cited above definitely demonstrate that all three castes of honeybees—the workers that are capable of performing so many tasks, the queen who ensures the continuation of the breed, and the drones who fertilize her—all appeared in a single moment. The only explanation for all of them appearing at once is the fact that they were created by God. The manifest truth is this: Like all other living things, God created honeybees together with all the attributes they possess. He has also placed them at the service of human beings by giving them the ability to manufacture far more honey than they require to meet their own needs.

From all the facts throughout this book, anyone possessed of reason and a conscience must draw this conclusion: God has infinite love and compassion for His servants. He is the sole Lord of all creatures and everything in the heavens and Earth. Every feature possessed by living things is a manifestation of His infinite wisdom and might.

**All praise belongs to God, the Lord of the heavens and the Lord of the Earth, Lord of all the worlds. All greatness belongs to Him in the heavens and earth. He is the Almighty, the All-Wise. (Surat al-Jathiyya: 36-37)**



## *Appendix*

# THE DECEPTION OF EVOLUTION

*[God is] Lord of the heavens and the earth and everything  
between them, the Almighty, the Endlessly Forgiving.  
(Surah Sâd: 66)*

**D**arwinism, in other words the theory of evolution, was put forward with the aim of denying the fact of creation, but is in truth nothing but failed, unscientific nonsense. This theory, which claims that life emerged by chance from inanimate matter, was invalidated by the scientific evidence of miraculous order in the universe and in living things. In this way, science confirmed the fact that God created the universe and the living things in it. The propaganda carried out today in order to keep the theory of evolution alive is based solely on the distortion of the scientific facts, biased interpretation, and lies and falsehoods disguised as science.

Yet this propaganda cannot conceal the truth. The fact that the theory of evolution is the greatest deception in the history of science has been expressed more and more in the scientific world over the last 20-30 years. Research carried out after the 1980s in particular has revealed that the claims of Darwinism are totally unfounded, something that has been stated by a large number of scientists. In the United States in particular, many scientists from such different fields as biology, biochemistry and paleontology recognize the invalidity of Darwinism and employ the fact of creation to account for the origin of life.

We have examined the collapse of the theory of evolution and the proofs of creation in great scientific detail in many of our works, and are still continuing to do so. Given the enormous importance of this subject, it will be of great benefit to summarize it here.

### **The Scientific Collapse of Darwinism**

Although this doctrine goes back as far as ancient Greece, the theory of evolution was advanced extensively in the nineteenth century. The most important development that made it the top topic of the world of science was Charles Darwin's *The Origin of Species*, published in 1859. In this book, he denied that God created different living species on Earth separately, for he claimed that all living beings had a common ancestor and



Charles Darwin

had diversified over time through small changes. Darwin's theory was not based on any concrete scientific finding; as he also accepted, it was just an "assumption." Moreover, as Darwin confessed in the long chapter of his book titled "Difficulties on Theory," the theory failed in the face of many critical questions.

Darwin invested all of his hopes in new scientific discoveries, which he expected to solve these difficulties. However, contrary to his expectations, scientific findings expanded the dimensions of these difficulties. The defeat of Darwinism in the face of science can be reviewed under three basic topics:

- 1) The theory cannot explain how life originated on Earth.
- 2) No scientific finding shows that the "evolutionary mechanisms" proposed by the theory have any evolutionary power at all.
- 3) The fossil record proves the exact opposite of what the theory suggests.

In this section, we will examine these three basic points in general outlines:

### **The First Insurmountable Step: The Origin of Life**

The theory of evolution posits that all living species evolved from a single living cell that emerged on the primitive Earth 3.8 billion years ago. How a single cell could generate millions of complex living species and, if such an evolution really occurred, why traces of it cannot be observed in the fossil record are some of the questions that the theory cannot answer. However, first and foremost, we need to ask: How did this "first cell" originate?

Since the theory of evolution denies creation and any kind of supernatural intervention, it maintains that the "first cell" originated coincidentally



within the laws of nature, without any design, plan or arrangement. According to the theory, inanimate matter must have produced a living cell as a result of coincidences. Such a claim, however, is inconsistent with the most unassailable rules of biology.

### "Life Comes From Life"

In his book, Darwin never referred to the origin of life. The primitive understanding of science in his time rested on the assumption that living beings had a very simple structure. Since medieval times, spontaneous generation, which asserts that non-living materials came together to form living organisms, had been widely accepted. It was commonly believed that insects came into being from food leftovers, and mice from wheat. Interesting experiments were conducted to prove this theory. Some wheat was placed on a dirty piece of cloth, and it was believed that mice would originate from it after a while.

Similarly, maggots developing in rotting meat was assumed to be evidence of spontaneous generation. However, it was later understood that worms did not appear on meat spontaneously, but were carried there by flies in the form of larvae, invisible to the naked eye.

Even when Darwin wrote *The Origin of Species*, the belief that bacteria could come into existence from non-living matter was widely accepted in the world of science.



Louis Pasteur

However, five years after the publication of Darwin's book, Louis Pasteur announced his results after long studies and experiments, that disproved spontaneous generation, a cornerstone of Darwin's theory. In his triumphal lecture at the Sorbonne in 1864, Pasteur said: "Never will the doctrine

of spontaneous generation recover from the mortal blow struck by this simple experiment."<sup>154</sup>

For a long time, advocates of the theory of evolution resisted these findings. However, as the development of science unraveled the complex structure of the cell of a living being, the idea that life could come into being coincidentally faced an even greater impasse.



Alexander Oparin

### **Inconclusive Efforts of the Twentieth Century**

The first evolutionist who took up the subject of the origin of life in the twentieth century was the renowned Russian biologist Alexander Oparin. With various theses he advanced in the 1930s, he tried to prove that a living cell could originate by coincidence. These studies, however, were doomed to failure, and Oparin had to make the following confession:

Unfortunately, however, the problem of the origin of the cell is perhaps the most obscure point in the whole study of the evolution of organisms.<sup>155</sup>

Evolutionist followers of Oparin tried to carry out experiments to solve this problem. The best known experiment was carried out by the American chemist Stanley Miller in 1953. Combining the gases he alleged to have existed in the primordial Earth's atmosphere in an experiment set-up, and adding energy to the mixture, Miller synthesized several organic molecules (amino acids) present in the structure of proteins.

Barely a few years had passed before it was revealed that this experiment, which was then presented as an important step in the name of evolution, was invalid, for the atmosphere used in the experiment was very different from the real Earth conditions.<sup>156</sup>

After a long silence, Miller confessed that the atmosphere medium he used was unrealistic.<sup>157</sup>

All the evolutionists' efforts throughout the twentieth century to explain the origin of life ended in failure. The geochemist Jeffrey Bada, from

the San Diego Scripps Institute accepts this fact in an article published in *Earth* magazine in 1998:

Today as we leave the twentieth century, we still face the biggest unsolved problem that we had when we entered the twentieth century: How did life originate on Earth?<sup>158</sup>



Stanley Miller

## The Complex Structure of Life

The primary reason why the theory of evolution ended up in such a great impasse regarding the origin of life is that even those living organisms deemed to be the simplest have incredibly complex structures. The cell of a living thing is more complex than all of our man-made technological products. Today, even in the most developed laboratories of the world, a living cell cannot be produced by bringing organic chemicals together.

The conditions required for the formation of a cell are too great in quantity to be explained away by coincidences. The probability of proteins, the building blocks of a cell, being synthesized coincidentally, is 1 in  $10^{950}$  for an average protein made up of 500 amino acids. In mathematics, a probability smaller than 1 over  $10^{50}$  is considered to be impossible in practical terms.

The DNA molecule, which is located in the nucleus of a cell and which stores genetic information, is an incredible databank. If the information coded in DNA were written down, it would make a giant library consisting of an estimated 900 volumes of encyclopedias consisting of 500 pages each.

A very interesting dilemma emerges at this point: DNA can replicate itself only with the help of some specialized proteins (enzymes). However, the synthesis of these enzymes can be realized only by the information

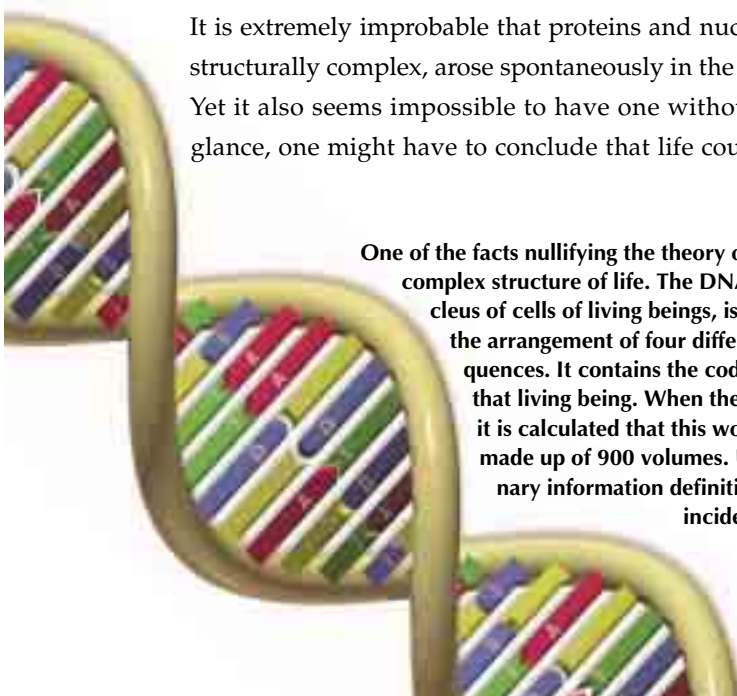


One of the evolutionists' gravest deceptions is the way they imagine that life could have emerged spontaneously on what they refer to as the primitive earth, represented in the picture above. They tried to prove these claims with such studies as the Miller experiment. Yet they again suffered defeat in the face of the scientific facts: The results obtained in the 1970s proved that the atmosphere on what they describe as the primitive earth was totally unsuited to life.

coded in DNA. As they both depend on each other, they have to exist at the same time for replication. This brings the scenario that life originated by itself to a deadlock. Prof. Leslie Orgel, an evolutionist of repute from the University of San Diego, California, confesses this fact in the September 1994 issue of the *Scientific American* magazine:

It is extremely improbable that proteins and nucleic acids, both of which are structurally complex, arose spontaneously in the same place at the same time. Yet it also seems impossible to have one without the other. And so, at first glance, one might have to conclude that life could never, in fact, have origi-

One of the facts nullifying the theory of evolution is the incredibly complex structure of life. The DNA molecule, located in the nucleus of cells of living beings, is a sort of databank formed of the arrangement of four different molecules in different sequences. It contains the codes of all the physical traits of that living being. When the human DNA is put into writing, it is calculated that this would result in an encyclopedia made up of 900 volumes. Unquestionably, such extraordinary information definitively refutes the concept of coincidence.



nated by chemical means.<sup>159</sup>

No doubt, if it is impossible for life to have originated from natural causes, then it has to be accepted that life was "created" in a supernatural way. This fact explicitly invalidates the theory of evolution, whose main purpose is to deny creation.

### **Imaginary Mechanism of Evolution**

The second important point that negates Darwin's theory is that both concepts put forward by the theory as "evolutionary mechanisms" were understood to have, in reality, no evolutionary power.

Darwin based his evolution allegation entirely on the mechanism of "natural selection." The importance he placed on this mechanism was evident in the name of his book: *The Origin of Species, By Means of Natural Selection...*

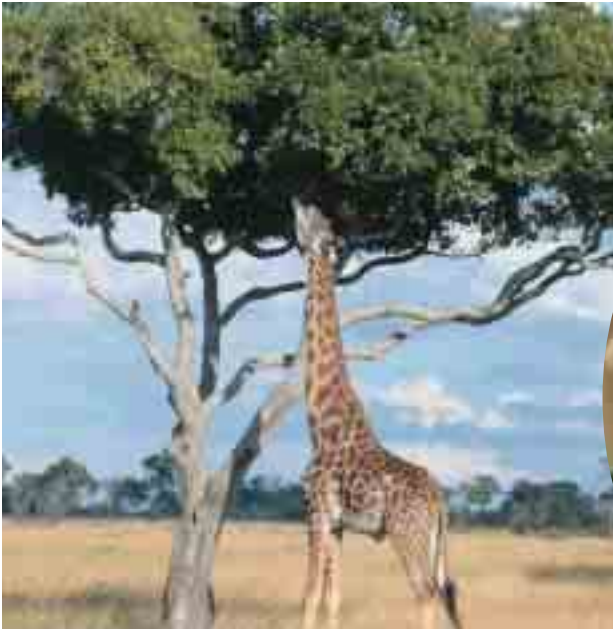
Natural selection holds that those living things that are stronger and more suited to the natural conditions of their habitats will survive in the struggle for life. For example, in a deer herd under the threat of attack by wild animals, those that can run faster will survive. Therefore, the deer herd will be comprised of faster and stronger individuals. However, unquestionably, this mechanism will not cause deer to evolve and transform themselves into another living species, for instance, horses.

Therefore, the mechanism of natural selection has no evolutionary power. Darwin was also aware of this fact and had to state this in his book *The Origin of Species*:

Natural selection can do nothing until favourable individual differences or variations occur.<sup>160</sup>

### **Lamarck's Impact**

So, how could these "favorable variations" occur? Darwin tried to answer this question from the standpoint of the primitive understanding of science at that time. According to the French biologist Chevalier de Lamarck (1744-1829), who lived before Darwin, living creatures passed on



Lamarck believed that giraffes evolved from such animals as antelopes. In his view, the necks of these grass-eating animals gradually grew longer, and they eventually turned into giraffes. The laws of inheritance discovered by Mendel in 1865 proved that it was impossible for properties acquired during life to be handed on to subsequent generations. Lamarck's giraffe fairy tale was thus consigned to the wastebin of history.

the traits they acquired during their lifetime to the next generation. He asserted that these traits, which accumulated from one generation to another, caused new species to be formed. For instance, he claimed that giraffes evolved from antelopes; as they struggled to eat the leaves of high trees, their necks were extended from generation to generation.

Darwin also gave similar examples. In his book *The Origin of Species*, for instance, he said that some bears going into water to find food transformed themselves into whales over time.<sup>161</sup>

However, the laws of inheritance discovered by Gregor Mendel (1822-84) and verified by the science of genetics, which flourished in the twentieth century, utterly demolished the legend that acquired traits were passed on to subsequent generations. Thus, natural selection fell out of favor as an evolutionary mechanism.

## Neo-Darwinism and Mutations

In order to find a solution, Darwinists advanced the "Modern Synthetic Theory," or as it is more commonly known, Neo-Darwinism, at the end of the 1930s. Neo-Darwinism added mutations, which are distortions formed in the genes of living beings due to such external factors as radiation or replication errors, as the "cause of favorable variations" in addition to natural mutation.

Today, the model that stands for evolution in the world is Neo-Darwinism. The theory maintains that millions of living beings formed as a result of a process whereby numerous complex organs of these organisms (e.g., ears, eyes, lungs, and wings) underwent "mutations," that is, genetic disorders. Yet, there is an outright scientific fact that totally undermines this theory: Mutations do not cause living beings to develop; on the contrary, they are always harmful.

The reason for this is very simple: DNA has a very complex structure, and random effects can only harm it. The American geneticist B. G. Ranganathan explains this as follows:

First, genuine mutations are very rare in nature. Secondly, most mutations are harmful since they are random, rather than orderly changes in the structure of genes; any random change in a highly ordered system will be for the worse, not for the better. For example, if an earthquake were to shake a highly ordered structure such as a building, there would be a random change in the framework of the building which, in all probability,



**Chance mutations, which evolutionists claim to develop living things, are always harmful to humans and all other living things. Not even one beneficial mutation has been observed so far. Quite the contrary, mutations always have harmful effects on living things as seen in this picture.**

would not be an improvement.<sup>162</sup>

Not surprisingly, no mutation example, which is useful, that is, which is observed to develop the genetic code, has been observed so far. All mutations have proved to be harmful. It was understood that mutation, which is presented as an "evolutionary mechanism," is actually a genetic occurrence that harms living things, and leaves them disabled. (The most common effect of mutation on human beings is cancer.) Of course, a destructive mechanism cannot be an "evolutionary mechanism." Natural selection, on the other hand, "can do nothing by itself," as Darwin also accepted. This fact shows us that there is no "evolutionary mechanism" in nature. Since no evolutionary mechanism exists, no such any imaginary process called "evolution" could have taken place.

### **The Fossil Record: No Sign of Intermediate Forms**

The clearest evidence that the scenario suggested by the theory of evolution did not take place is the fossil record.

According to this theory, every living species has sprung from a predecessor. A previously existing species turned into something else over time and all species have come into being in this way. In other words, this transformation proceeds gradually over millions of years.

Had this been the case, numerous intermediary species should have existed and lived within this long transformation period.

For instance, some half-fish/half-reptiles should have lived in the past which had acquired some reptilian traits in addition to the fish traits they already had. Or there should have existed some reptile-birds, which acquired some bird traits in addition to the reptilian traits they already had. Since these would be in a transitional phase, they should be disabled, defective, crippled living beings. Evolutionists refer to these imaginary creatures, which they believe to have lived in the past, as "transitional forms."

If such animals ever really existed, there should be millions and even billions of them in number and variety. More importantly, the remains of these strange creatures should be present in the fossil record. In *The Origin*



## LIVING FOSSILS REFUTE EVOLUTION



150- to 100-million-year-old starfish fossil (L. Cretaceous period)



450-million-year-old horseshoe crab from the Ordovician period



200- to 150-million-year-old dragonfly fossil from the recent Jurassic period



150- to 100-million-year-old fossil shrimp from the L. Cretaceous period

**Different groups of living things suddenly emerged with no similar ancestors behind them, and remained static for millions of years, undergoing no changes at all.**



The theory of evolution claims that living species gradually evolved from one another. The fossil record, however, explicitly falsifies this claim. For example, in the Cambrian period, some 550 million years ago, tens of totally distinct living species emerged suddenly. These living beings depicted in the above picture have very complex structures. This fact, referred to as the “Cambrian Explosion” in scientific literature is plain evidence of creation.

*of Species*, Darwin explained:

If my theory be true, numberless intermediate varieties, linking most closely all of the species of the same group together must assuredly have existed... Consequently, evidence of their former existence could be found only amongst fossil remains.<sup>163</sup>

### **Darwin's Hopes Shattered**

However, although evolutionists have been making strenuous efforts to find fossils since the middle of the nineteenth century all over the world, no transitional forms have yet been uncovered. All of the fossils, contrary to the evolutionists' expectations, show that life appeared on

Earth all of a sudden and fully-formed.

One famous British paleontologist, Derek V. Ager, admits this fact, even though he is an evolutionist:

The point emerges that if we examine the fossil record in detail, whether at the level of orders or of species, we find – over and over again – not gradual evolution, but the sudden explosion of one group at the expense of another.<sup>164</sup>

This means that in the fossil record, all living species suddenly emerge as fully formed, without any intermediate forms in between. This is just the opposite of Darwin's assumptions. Also, this is very strong evidence that all living things are created. The only explanation of a living species emerging suddenly and complete in every detail without any evolutionary ancestor is that it was created. This fact is admitted also by the widely known evolutionist biologist Douglas Futuyma:

Creation and evolution, between them, exhaust the possible explanations for the origin of living things. Organisms either appeared on the earth fully developed or they did not. If they did not, they must have developed from pre-existing species by some process of modification. If they did appear in a fully developed state, they must indeed have been created by some omnipotent intelligence.<sup>165</sup>

Fossils show that living beings emerged fully developed and in a perfect state on the Earth. That means that "the origin of species," contrary to Darwin's supposition, is not evolution, but creation.

## **The Tale of Human Evolution**

The subject most often brought up by advocates of the theory of evolution is the subject of the origin of man. The Darwinist claim holds that modern man evolved from ape-like creatures. During this alleged evolutionary process, which is supposed to have started 4-5 million years ago, some "transitional forms" between modern man and his ancestors are supposed to have existed. According to this completely imaginary scenario, four basic "categories" are listed:

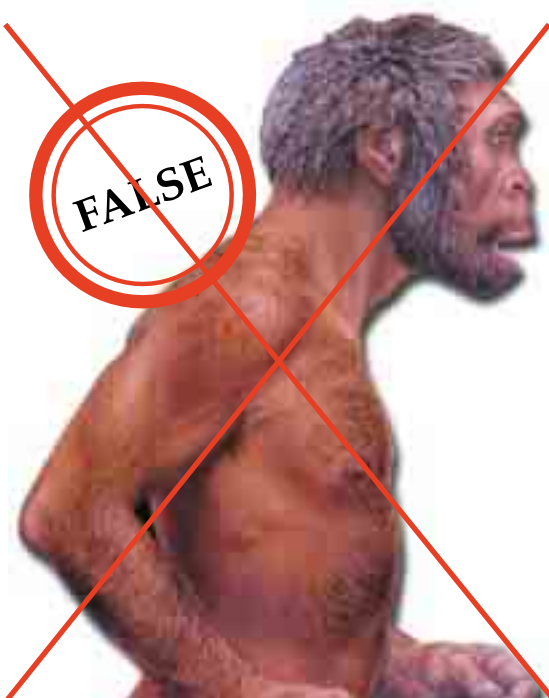
1. *Australopithecus*

2. *Homo habilis*
3. *Homo erectus*
4. *Homo sapiens*

Evolutionists call man's so-called first ape-like ancestors *Australopithecus*, which means "South African ape." These living beings are actually nothing but an old ape species that has become extinct. Extensive research done on various *Australopithecus* specimens by two world famous anatomists from England and the USA, namely, Lord Solly Zuckerman and Prof. Charles Oxnard, shows that these apes belonged to an ordinary ape species that became extinct and bore no resemblance to humans.<sup>166</sup>

Evolutionists classify the next stage of human evolution as "homo," that is "man." According to their claim, the living beings in the Homo series are more developed than *Australopithecus*. Evolutionists devise a fanciful evolution scheme by arranging different fossils of these creatures in a particular order. This scheme is imaginary because it has never been proved that there is an evolutionary relation between these different classes. Ernst Mayr, one of the twentieth century's most important evolutionists, contends in his book *One Long Argument* that "particularly historical [puzzles] such as the origin of life or of *Homo sapiens*, are extremely difficult and may even resist a final, satisfying explanation."<sup>167</sup>

By outlining the link



Evolutionist newspapers and magazines often print pictures of primitive man. The only available source for these pictures is the imagination of the artist. Evolutionary theory has been so dented by scientific data that today we see less and less of it in the serious press.

chain as *Australopithecus* > *Homo habilis* > *Homo erectus* > *Homo sapiens*, evolutionists imply that each of these species is one another's ancestor. However, recent findings of paleoanthropologists have revealed that *Australopithecus*, *Homo habilis*, and *Homo erectus* lived at different parts of the world at the same time.<sup>168</sup>

Moreover, a certain segment of humans classified as *Homo erectus* have lived up until very modern times. *Homo sapiens neanderthalensis* and *Homo sapiens sapiens* (modern man) co-existed in the same region.<sup>169</sup>

This situation apparently indicates the invalidity of the claim that they are ancestors of one another. Stephen Jay Gould explained this deadlock of the theory of evolution, although he was himself one of the leading advocates of evolution in the twentieth century:

What has become of our ladder if there are three coexisting lineages of hominids (*A. africanus*, the robust australopithecines, and *H. habilis*), none clearly derived from another? Moreover, none of the three display any evolutionary trends during their tenure on earth.<sup>170</sup>

Put briefly, the scenario of human evolution, which is "upheld" with the help of various drawings of some "half ape, half human" creatures appearing in the media and course books, that is, frankly, by means of propaganda, is nothing but a tale with no scientific foundation.

Lord Solly Zuckerman, one of the most famous and respected scientists in the U.K., who carried out research on this subject for years and studied *Australopithecus* fossils for 15 years, finally concluded, despite being an evolutionist himself, that there is, in fact, no such family tree branching out from ape-like creatures to man.

Zuckerman also made an interesting "spectrum of science" ranging from those he considered scientific to those he considered unscientific. According to Zuckerman's spectrum, the most "scientific"—that is, depending on concrete data—fields of science are chemistry and physics. After them come the biological sciences and then the social sciences. At the far end of the spectrum, which is the part considered to be most "unscientific," are "extra-sensory perception"—concepts such as telepathy

and sixth sense—and finally "human evolution." Zuckerman explains his reasoning:

We then move right off the register of objective truth into those fields of presumed biological science, like extrasensory perception or the interpretation of man's fossil history, where to the faithful [evolutionist] anything is possible – and where the ardent believer [in evolution] is sometimes able to believe several contradictory things at the same time.<sup>171</sup>

The tale of human evolution boils down to nothing but the prejudiced interpretations of some fossils unearthed by certain people, who blindly adhere to their theory.

### **Darwinian Formula!**

Besides all the technical evidence we have dealt with so far, let us now for once, examine what kind of a superstition the evolutionists have with an example so simple as to be understood even by children:

The theory of evolution asserts that life is formed by chance. According to this claim, lifeless and unconscious atoms came together to form the cell and then they somehow formed other living things, including man. Let us think about that. When we bring together the elements that are the building-blocks of life such as carbon, phosphorus, nitrogen and potassium, only a heap is formed. No matter what treatments it undergoes, this atomic heap cannot form even a single living being. If you like, let us formulate an "experiment" on this subject and let us examine on the behalf of evolutionists what they really claim without pronouncing loudly under the name "Darwinian formula":

Let evolutionists put plenty of materials present in the composition of living things such as phosphorus, nitrogen, carbon, oxygen, iron, and magnesium into big barrels. Moreover, let them add in these barrels any material that does not exist under normal conditions, but they think as necessary. Let them add in this mixture as many amino acids and as many proteins—a single one of which has a formation probability of 1 over  $10^{950}$ —as they like. Let them expose these mixtures to as much heat and

moisture as they like. Let them stir these with whatever technologically developed device they like. Let them put the foremost scientists beside these barrels. Let these experts wait in turn beside these barrels for billions, and even trillions of years. Let them be free to use all kinds of conditions they believe to be necessary for a human's formation. No matter what they do, they cannot produce from these barrels a human, say a professor that examines his cell structure under the electron microscope. They cannot produce giraffes, lions, bees, canaries, horses, dolphins, roses, orchids, lilies, carnations, bananas, oranges, apples, dates, tomatoes, melons, watermelons, figs, olives, grapes, peaches, peafowls, pheasants, multicoloured butterflies, or millions of other living beings such as these. Indeed, they could not obtain even a single cell of any one of them.

Briefly, unconscious atoms cannot form the cell by coming together. They cannot take a new decision and divide this cell into two, then take other decisions and create the professors who first invent the electron microscope and then examine their own cell structure under that microscope. Matter is an unconscious, lifeless heap, and it comes to life with God's superior creation.

The theory of evolution, which claims the opposite, is a total fallacy completely contrary to reason. Thinking even a little bit on the claims of evolutionists discloses this reality, just as in the above example.

### **Technology in the Eye and the Ear**

Another subject that remains unanswered by evolutionary theory is the excellent quality of perception in the eye and the ear.

Before passing on to the subject of the eye, let us briefly answer the question of how we see. Light rays coming from an object fall oppositely on the eye's retina. Here, these light rays are transmitted into electric signals by cells and reach a tiny spot at the back of the brain, the "center of vision." These electric signals are perceived in this center as an image after a series of processes. With this technical background, let us do some thinking.

The brain is insulated from light. That means that its inside is completely dark, and that no light reaches the place where it is located. Thus, the "center of vision" is never touched by light and may even be the darkest place you have ever known. However, you observe a luminous, bright world in this pitch darkness.

The image formed in the eye is so sharp and distinct that even the technology of the twentieth century has not been able to attain it. For instance, look at the book you are reading, your hands with which you are holding it, and then lift your head and look around you. Have you ever seen such a sharp and distinct image as this one at any other place? Even the most developed television screen produced by the greatest television producer in the world cannot provide such a sharp image for you. This is a three-dimensional, colored, and extremely sharp image. For more than 100 years, thousands of engineers have been trying to achieve this sharpness. Factories, huge premises were established, much research has been done, plans and designs have been made for this purpose. Again, look at a TV screen and the book you hold in your hands. You will see that there is a big difference in sharpness and distinction. Moreover, the TV screen shows you a two-dimensional image, whereas with your eyes, you watch a three-dimensional perspective with depth.

For many years, tens of thousands of engineers have tried to make a three-dimensional TV and achieve the vision quality of the eye. Yes, they have made a three-dimensional television system, but it is not possible to watch it without putting on special 3-D glasses; moreover, it is only an artificial three-dimension. The background is more blurred, the foreground appears like a paper setting. Never has it been possible to produce a sharp and distinct vision like that of the eye. In both the camera and the television, there is a loss of image quality.

Evolutionists claim that the mechanism producing this sharp and distinct image has been formed by chance. Now, if somebody told you that the television in your room was formed as a result of chance, that all of its atoms just happened to come together and make up this device that pro-



duces an image, what would you think? How can atoms do what thousands of people cannot?

If a device producing a more primitive image than the eye could not have been formed by chance, then it is very evident that the eye and the image seen by the eye could not have been formed by chance. The same situation applies to the ear. The outer ear picks up the available sounds by the auricle and directs them to the middle ear, the middle ear transmits the sound vibrations by intensifying them, and the inner ear sends these vibrations to the brain by translating them into electric signals. Just as with the eye, the act of hearing finalizes in the center of hearing in the brain.

The situation in the eye is also true for the ear. That is, the brain is insulated from sound just as it is from light. It does not let any sound in. Therefore, no matter how noisy is the outside, the inside of the brain is completely silent. Nevertheless, the sharpest sounds are perceived in the brain. In your completely silent brain, you listen to symphonies, and hear all of the noises in a crowded place. However, were the sound level in your brain measured by a precise device at that moment, complete silence would be found to be prevailing there.

As is the case with imagery, decades of effort have been spent in trying to generate and reproduce sound that is faithful to the original. The results of these efforts are sound recorders, high-fidelity systems, and systems for sensing sound. Despite all of this technology and the thousands of engineers and experts who have been working on this endeavor, no sound has yet been obtained that has the same sharpness and clarity as the sound perceived by the ear. Think of the highest-quality hi-fi systems produced by the largest company in the music industry. Even in these devices, when sound is recorded some of it is lost; or when you turn on a hi-fi you always hear a hissing sound before the music starts. However, the sounds that are the products of the human body's technology are extremely sharp and clear. A human ear never perceives a sound accompanied by a hissing sound or with atmospherics as does a hi-fi; rather, it perceives sound exactly as it is, sharp and clear. This is the way it has been since the creation

of man.

So far, no man-made visual or recording apparatus has been as sensitive and successful in perceiving sensory data as are the eye and the ear. However, as far as seeing and hearing are concerned, a far greater truth lies beyond all this.

### **To Whom Does the Consciousness that Sees and Hears within the Brain Belong?**

Who watches an alluring world in the brain, listens to symphonies and the twittering of birds, and smells the rose?

The stimulations coming from a person's eyes, ears, and nose travel to the brain as electro-chemical nerve impulses. In biology, physiology, and biochemistry books, you can find many details about how this image forms in the brain. However, you will never come across the most important fact: Who perceives these electro-chemical nerve impulses as images, sounds, odors, and sensory events in the brain? There is a consciousness in the brain that perceives all this without feeling any need for an eye, an ear, and a nose. To whom does this consciousness belong? Of course it does not belong to the nerves, the fat layer, and neurons comprising the brain. This is why Darwinist-materialists, who believe that everything is comprised of matter, cannot answer these questions.

For this consciousness is the spirit created by God, which needs neither the eye to watch the images nor the ear to hear the sounds. Furthermore, it does not need the brain to think.

Everyone who reads this explicit and scientific fact should ponder on Almighty God, and fear and seek refuge in Him, for He squeezes the entire universe in a pitch-dark place of a few cubic centimeters in a three-dimensional, colored, shadowy, and luminous form.

### **A Materialist Faith**

The information we have presented so far shows us that the theory of evolution is incompatible with scientific findings. The theory's claim regard-

ing the origin of life is inconsistent with science, the evolutionary mechanisms it proposes have no evolutionary power, and fossils demonstrate that the required intermediate forms have never existed. So, it certainly follows that the theory of evolution should be pushed aside as an unscientific idea. This is how many ideas, such as the Earth-centered universe model, have been taken out of the agenda of science throughout history.

However, the theory of evolution is kept on the agenda of science. Some people even try to represent criticisms directed against it as an "attack on science." Why?

The reason is that this theory is an indispensable dogmatic belief for some circles. These circles are blindly devoted to materialist philosophy and adopt Darwinism because it is the only materialist explanation that can be put forward to explain the workings of nature.

Interestingly enough, they also confess this fact from time to time. A well-known geneticist and an outspoken evolutionist, Richard C. Lewontin from Harvard University, confesses that he is "first and foremost a materialist and then a scientist":

It is not that the methods and institutions of science somehow compel us accept a material explanation of the phenomenal world, but, on the contrary, that we are forced by our a priori adherence to material causes to create an apparatus of investigation and a set of concepts that produce material explanations, no matter how counter-intuitive, no matter how mystifying to the uninitiated. Moreover, that materialism is absolute, so we cannot allow a Divine Foot in the door.<sup>172</sup>

These are explicit statements that Darwinism is a dogma kept alive just for the sake of adherence to materialism. This dogma maintains that there is no being save matter. Therefore, it argues that inanimate, unconscious matter created life. It insists that millions of different living species (e.g., birds, fish, giraffes, tigers, insects, trees, flowers, whales, and human beings) originated as a result of the interactions between matter such as pouring rain, lightning flashes, and so on, out of inanimate matter. This is a precept contrary both to reason and science. Yet Darwinists continue to defend it just so as "not to allow a Divine Foot in the door."

Anyone who does not look at the origin of living beings with a materialist prejudice will see this evident truth: All living beings are works of a Creator, Who is All-Powerful, All-Wise, and All-Knowing. This Creator is God, Who created the whole universe from non-existence, designed it in the most perfect form, and fashioned all living beings.

### **The Theory of Evolution: The Most Potent Spell in the World**

Anyone free of prejudice and the influence of any particular ideology, who uses only his or her reason and logic, will clearly understand that belief in the theory of evolution, which brings to mind the superstitions of societies with no knowledge of science or civilization, is quite impossible.

As explained above, those who believe in the theory of evolution think that a few atoms and molecules thrown into a huge vat could produce thinking, reasoning professors and university students; such scientists as Einstein and Galileo; such artists as Humphrey Bogart, Frank Sinatra and Luciano Pavarotti; as well as antelopes, lemon trees, and carnations. Moreover, as the scientists and professors who believe in this nonsense are educated people, it is quite justifiable to speak of this theory as "the most potent spell in history." Never before has any other belief or idea so taken away peoples' powers of reason, refused to allow them to think intelligently and logically and hidden the truth from them as if they had been blindfolded. This is an even worse and unbelievable blindness than the totem worship in some parts of Africa, the people of Saba worshipping the Sun, the tribe of Prophet Abraham (pbuh) worshipping idols they had made with their own hands, or the people of Prophet Moses (pbuh) worshipping the Golden Calf.

In fact, God has pointed to this lack of reason in the Qur'an. In many verses, He reveals that some peoples' minds will be closed and that they will be powerless to see the truth. Some of these verses are as follows:

**As for those who do not believe, it makes no difference to them whether you warn them or do not warn them, they will not believe. God has**

**sealed up their hearts and hearing and over their eyes is a blindfold. They will have a terrible punishment. (Surat al-Baqara: 6-7)**

**They have hearts with which they do not understand. They have eyes with which they do not see. They have ears with which they do not hear. Such people are like cattle. No, they are even further astray! They are the unaware. (Surat al-A'raf: 179)**

**Even if We opened up to them a door into heaven, and they spent the day ascending through it, they would only say: "Our eyesight is befuddled! Or rather we have been put under a spell!" (Surat al-Hijr: 14-15)**

Words cannot express just how astonishing it is that this spell should hold such a wide community in thrall, keep people from the truth, and not be broken for 150 years. It is understandable that one or a few people might believe in impossible scenarios and claims full of stupidity and illogicality. However, "magic" is the only possible explanation for people from all over the world believing that unconscious and lifeless atoms suddenly decided to come together and form a universe that functions with a flawless system of organization, discipline, reason, and consciousness; a planet named Earth with all of its features so perfectly suited to life; and living things full of countless complex systems.

In fact, the Qur'an relates the incident of Prophet Moses (pbuh) and Pharaoh to show that some people who support atheistic philosophies actually influence others by magic. When Pharaoh was told about the true religion, he told Prophet Moses (pbuh) to meet with his own magicians. When Prophet Moses (pbuh) did so, he told them to demonstrate their abilities first. The verses continue:

**He said: "You throw." And when they threw, they cast a spell on the people's eyes and caused them to feel great fear of them. They produced an extremely powerful magic. (Surat al-A'raf: 116)**

As we have seen, Pharaoh's magicians were able to deceive everyone, apart from Prophet Moses (pbuh) and those who believed in him. However, his evidence broke the spell, or "swallowed up what they had forged," as the verse puts it:

**We revealed to Moses: "Throw down your staff." And it immediately**

**swallowed up what they had forged. So the Truth took place and what they did was shown to be false. (Surat al-A'raf: 117-118)**

As we can see, when people realized that a spell had been cast upon them and that what they saw was just an illusion, Pharaoh's magicians lost all credibility. In the present day too, unless those who, under the influence of a similar spell, believe in these ridiculous claims under their scientific disguise and spend their lives defending them, abandon their superstitious beliefs, they also will be humiliated when the full truth emerges and the spell is broken. In fact, world-renowned British writer and philosopher Malcolm Muggeridge, who was an atheist defending evolution for some 60 years, but who subsequently realized the truth, reveals the position in which the theory of evolution would find itself in the near future in these terms:

I myself am convinced that the theory of evolution, especially the extent to which it's been applied, will be one of the great jokes in the history books in the future. Posterity will marvel that so very flimsy and dubious an hypothesis could be accepted with the incredible credulity that it has.<sup>173</sup>

That future is not far off: On the contrary, people will soon see that "chance" is not a deity, and will look back on the theory of evolution as the worst deceit and the most terrible spell in the world. That spell is already rapidly beginning to be lifted from the shoulders of people all over the world. Many people who see its true face are wondering with amazement how they could ever have been taken in by it.

**They said, "Glory be to You!  
We have no knowledge except  
what You have taught us. You are  
the All-Knowing, the All-Wise."  
(Surat al-Baqara, 32)**

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