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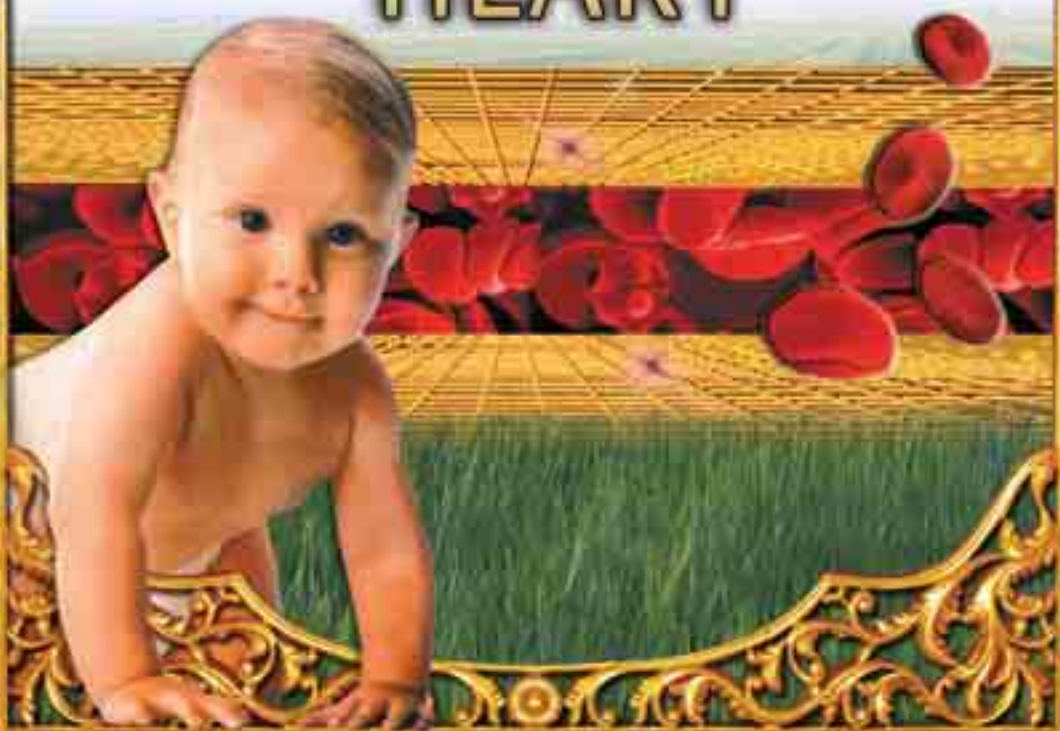
HARUN YAHYA

THE MIRACLE OF THE BLOOD AND HEART

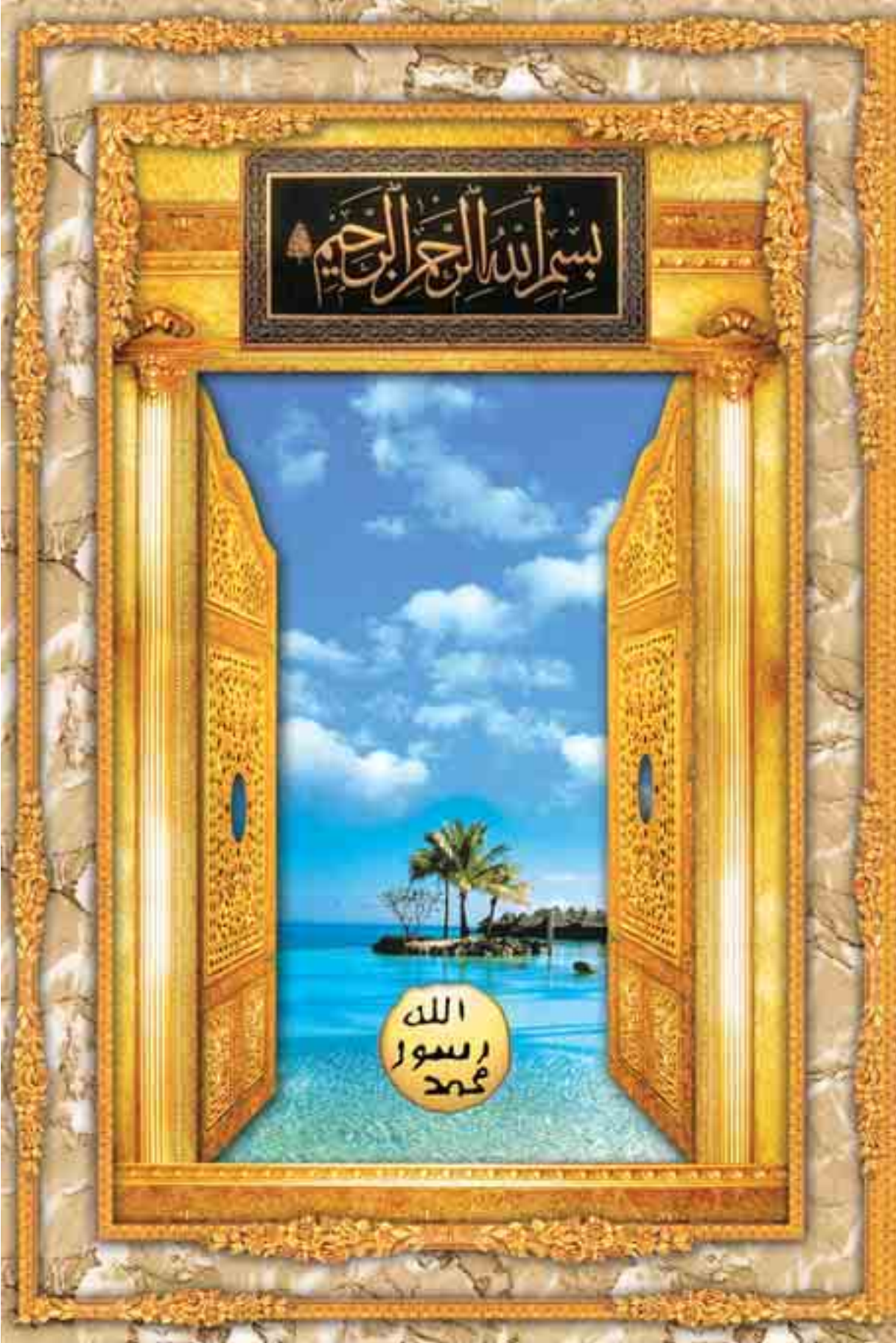


If you had never been aware of the existence of the blood flowing in your body and then suddenly discovered it one day, you would be surprised. The first fact to amaze you would be the prevailing red color just beneath your skin. When you learned that the liquid causing it was constantly flowing at high speed, you would be even more astonished. When scratched or nicked, you would watch how blood flowed to the surface, soon stopped and coagulated by itself. When you examined its workings in some detail, you would realize that your body could not survive without blood and perhaps more interestingly, the blood could not survive without your body. You would then begin to wonder how and why this special fluid had been placed inside your body.

According to evolutionists, this magnificent universe, the flawless human body, all the different species of animals and plants—in short, everything that exists—came about by chance. However, when one examines anything on Earth in any detail, one can easily see how terribly erroneous the theory of evolution really is. Any biological system is so detailed and rational that far from it being brought into existence by chance, the slightest deviance would clearly disrupt its functioning.

There is flawlessness in every part and every detail in the system. Human beings discovered the details of this perfect system just in the last hundred years, and only in general terms. It is Almighty God, He Who is superior to all, Who created all these.

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.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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.

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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 opportunity to read only one of our books, we think it 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 BLOOD AND HEART

HARUN YAHYA

All translations from the Qur'an are from *The Noble Qur'an: a New Rendering of its Meaning in English* by Hajj Abdalhaqq and Aisha Bewley, published by Bookwork, Norwich, UK. 1420 CE/1999 AH.

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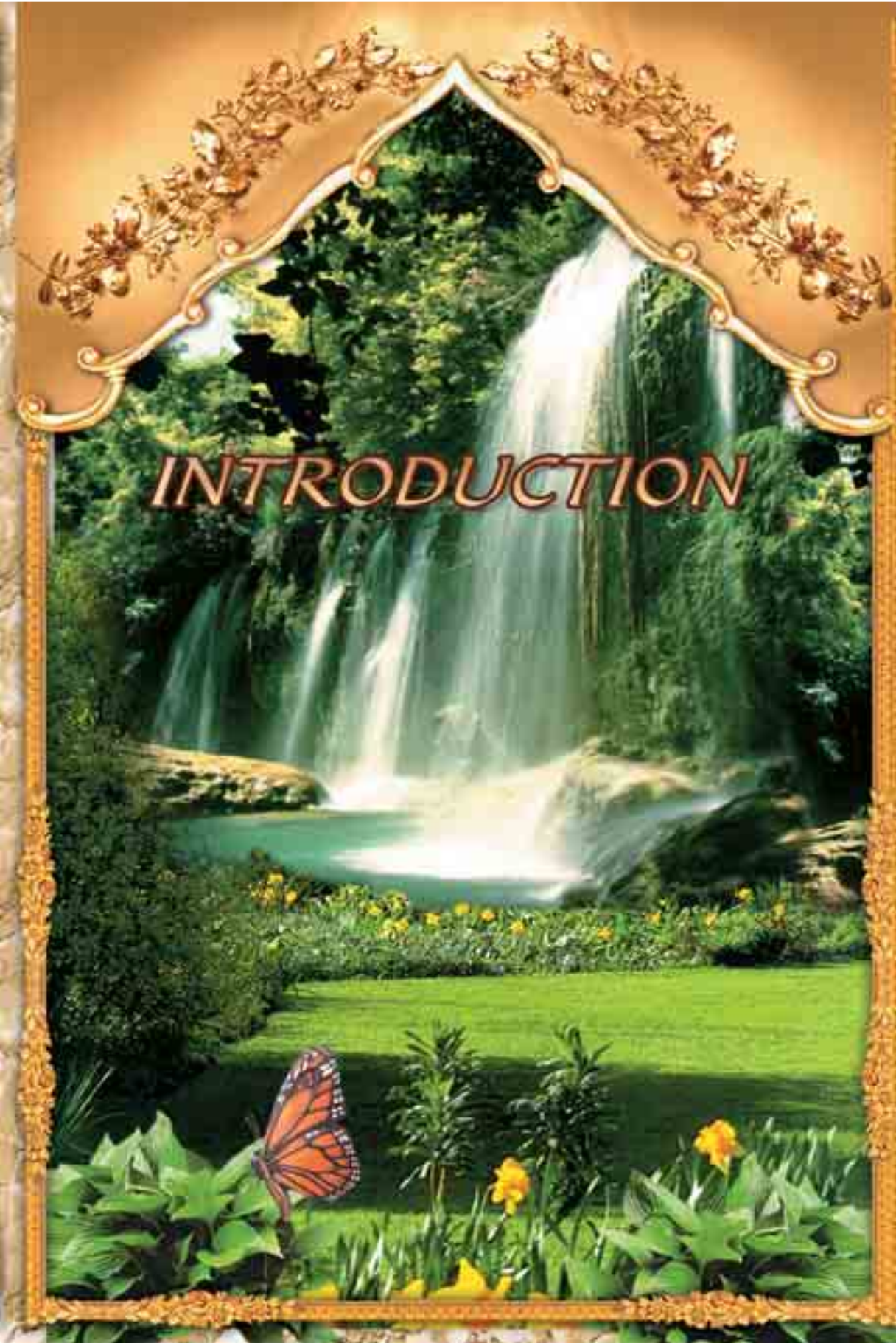
INTRODUCTION

Before they are born, all human beings—including yourself—spend nine months in their mothers' wombs. At the beginning of its development, each human being consists of a tiny collection of cells just starting to divide and develop.

On the 22nd day, the embryo is even smaller than a baked bean. One day, a small node of cells in the center of that assemblage receives a command and suddenly starts pulsating. All the other cells in the body lie quiet. But this group is in constant motion, and never stops for as long as the person will live.

Never does it feel the need to stop for even a moment's rest—not until the day, decades later, when it receives the ultimate command to stop.

During the intervening period, a human being completes his or her lifespan. Who gives this tiny node the command to start and finally stop?

This perfect pump, which began its beating when you were just three weeks old in your mother's womb, bears a most important responsibility: ensuring the circulation of the blood in your body. In other words, it maintains life in the 100 trillion cells in your body which are just as alive as you. It permits these cells to absorb oxygen and release carbon dioxide. It nourishes and cleanses them, cures them of their diseases and ailments, and guards them against their microbe enemies…

Who establishes the cells that comprise you—and thus, this system that keeps you alive?

And what have you done to ensure the existence of this circulatory system that gives you life? There was absolutely nothing you could do to have formed such a system, because before you even opened your

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eyes, you began living according to a regimen prepared for you in advance. Your body was prepared for you in a flawless manner. For example, a perfect pair of eyes was created for you to be able to see your surroundings clearly.

Although you had never encountered the air in the external world until the moment you were born and took your first breath, the respiratory system that enables you to breathe was formed while you were still in your mother's womb. You were born with a ready-made digestive system that would eventually digest foods of all kinds. Your body came "ready-made," bearing fingers and toes with their prints unique to you, eyelids and lashes to protect your eyes from foreign bodies, and countless other such organs and distinctive features.

In addition, protective measures—such as the reflex that enables you to protect your eyes by closing them when an object approaches at high speed—and many others were prepared and placed in your body. But you never made any effort to acquire any of these features.

It is God Who created these systems for you and placed them in your body in the most flawless manner. Almighty God created the same perfect systems in all human beings who have ever lived, and in all those billions of humans who are living today.

The heart that gives you life and the circulation system are a central, indispensable part of this flawless and impeccable order. The miraculous fluid known as blood, pumped by your heart muscle, has been carrying life-giving substances to every cell in your body from the moment it started to flow. Blood reaches every point in the body, from the eyes to the fingers, through a perfect circulatory network

that interpenetrates the entire body. As you grow, so it expands. When you fall ill, it protects you. It enables your every cell to be nourished so you can keep on living. It cleans your body of wastes and impurities. Most important of all, it undertakes the responsibility for carrying oxygen molecules to every cell in your body, thus keeping you alive.

This fluid flowing through your body, your blood, is a special blessing and a great miracle. Let us examine how it operates so that we may once again witness the existence and might of our Lord, the Creator.

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 verses of the Qur'an tell us:

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)

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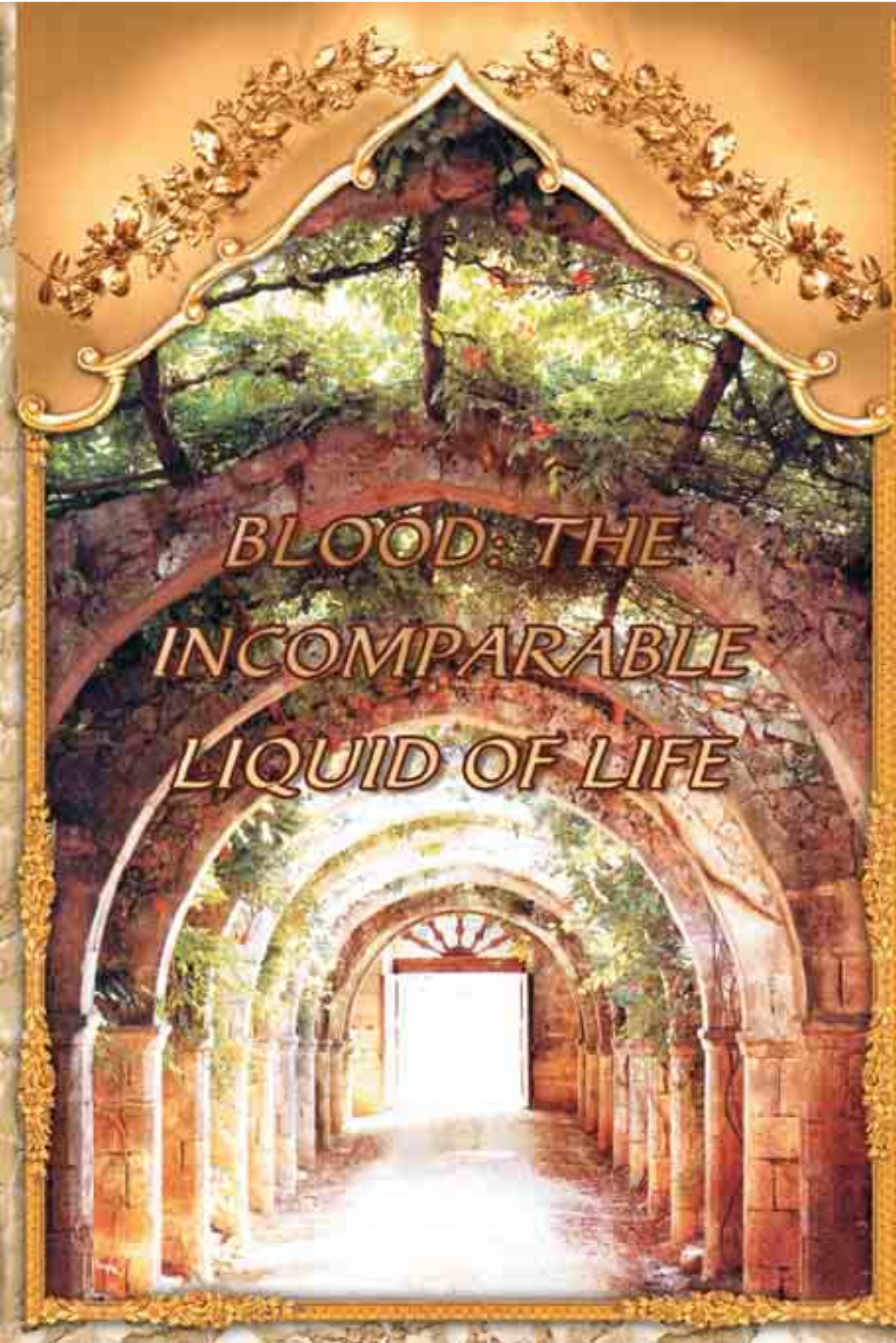
BLOOD: THE
INCOMPARABLE
LIQUID OF LIFE

Look at yourself in the mirror. Can you feel the presence of a network of crimson red fluid pumping at high speed and pressure just 2 millimeters under the skin of your face? Are you aware of a magnificent network of veins, altogether thousands of kilometers in length, and a pumping heart capable of squirting blood meters high into the air?

No! There is no sign of this impressive movement in your reflection in the mirror. Yet this activity continues ceaselessly while you get on with your life. Even while you are asleep, your heart pumps blood with great power and audible sound known as your heartbeat, and the blood flows at great speed, again with a sound known as your pulse. The chief reason why you are unaware of all this is your delicate skin, created specially for you. This gives you an attractive, ordered and calm appearance while concealing and protecting all this activity beneath it.

This circulatory system is formed collectively by your blood, heart and network of blood vessels, and functions without pause throughout your life. The flowing of the blood, with all its countless features, is one of the matchless proofs of creation.

The blood acts both as a carrier and as a regulator within the body. It flows constantly and has tasks that it will not fail to perform at every moment throughout that journey:

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◆ The blood is responsible for nearly all the communication inside the body.

◆ Raw materials necessary for the cells, and therefore for the body to obtain energy, are transported in the blood.

◆ The blood adjusts the body's temperature just like an air conditioning unit. Thanks to its circulation, our body temperature always remains the same.

◆ As the blood flows, the defensive antibodies and white cells in it are on constant duty. They are always on guard against germs that might enter the body.

◆ The blood is also responsible for providing the body's nutrition. Foodstuffs are distributed to every cell by means of the blood.

◆ The veins and arteries also act as a sewage system in which waste products and toxins are carried away.

◆ The blood also contains a kind of repair unit, which immediately identifies any tears or damage occurring in the veins and repairs them. But how does this mechanism, that manages such different and necessary tasks, function? What

elements comprise it? What makes all these elements compatible with the circulatory network? Which molecules in the blood are responsible for which tasks? How do they perform their duties and how do they move? Where do they receive their instructions from and how are they organized?

All these are important questions, of course, whose answers shall be examined in this book in detail. Those answers also lead to a very important truth, of interest to our entire lives: Our bodies did not emerge haphazardly. The bodies that we possess have been shaped down to the finest detail. The origin of this body cannot be *coincidences* as the Darwinists have claimed for more than 150 years. Our origins lie in *creation*, in which every detail has been specially created, not in a so-called *evolutionary* process based on chance.

The Lord of that creation is Almighty God, Who has created not just human beings but all living things, the entire universe, and everything that exists.

The miracle in the circulation of the blood is just one of the matchless examples of God's creation. This book shall be examining the details in the blood, its composition and the organs that maintain it in motion, revealing the harmony and flawlessness in those details and displaying the perfection in God's creation. The superior nature of His creation is revealed in the Qur'an, sent down to us as a guide:

> **Don't they see that God, Who created the heavens and Earth, has the power to create the like of them, and has appointed fixed terms for them of which there is no doubt? But the wrongdoers still spurn anything but disbelief.**
> **(Surat al-Isra': 99)**

BLOOD: AN INIMITABLE FLUID

Blood is the cause not only of life in general but also of longer or short life, of sleep and watching, of genius, aptitude and strength. It is the first to live and the last to die.[1]

For a long time now, scientists have been trying to produce a substance resembling blood, but they have not been successful.[2] The most important reason for this is that the secret of the very special molecules carried in the blood, and the functions these perform, have not yet been fully unraveled. In fact, however, even if the properties of blood were to be fully understood, how to reproduce molecules possessing those features and making them fully functional would still represent a total impasse for scientists.

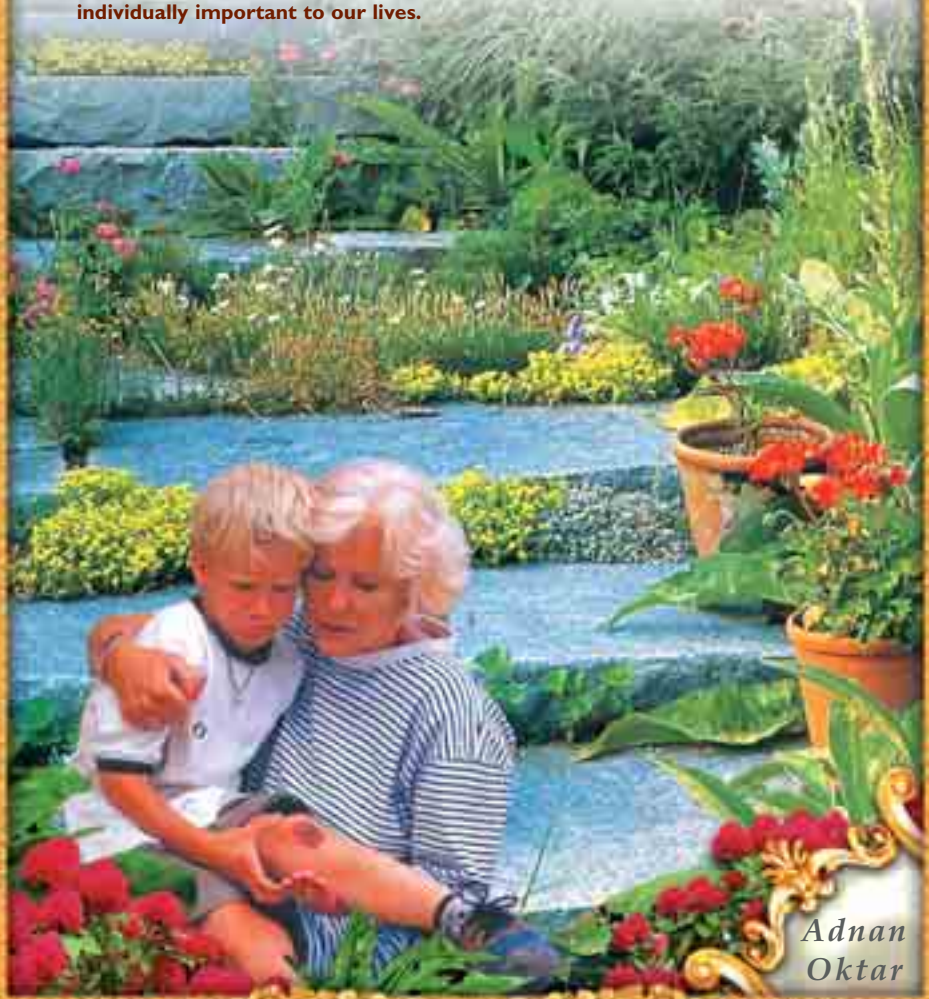
When we examine the individual elements that make up the blood, this statement will become clearer. Every single molecule has been charged with and shaped for a special purpose. To put it another way, the presence of a special creation in the bloodstream is manifest.

Rather than being simply a fluid, blood is actually a tissue, like the bones and muscles in our bodies.

However, it is very different from these, because the cells that comprise bone or muscle tissues are tightly bound to one another. Despite being a tissue, the cells in the blood move freely, independently of one another. Red blood cells *(erythrocytes)*, white blood cells *(leukocytes)* and thrombocytes float in the blood plasma.

The human body contains between 5 and 6 liters (1.3 and

A child who falls and cuts his knee actually loses millions of erythrocytes and thrombocytes, and thousands of leukocytes. All these cells in the blood are individually important to our lives.



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The cells in the blood represent only half the volume of blood in the body. A drop of blood contains some five million red blood cells, 10,000 white blood cells and 250,000 thrombocytes.

1.5 gallons) of blood, which represents between 7 and 8% of the average body weight. Half of the blood consists of the fluid or "watery" part known as plasma. The other half is made up of cells and molecules with various functions. A drop of blood that leaks from your finger because of a tiny cut contains some five million red blood cells, 10,000 white blood cells and 250,000 thrombocytes. In addition, each member of this enormous community has very important duties.[3]

Furthermore, these cells are constantly being renewed. Every day, 260 to 400 *billion* new blood cells are produced in the body. This truly astonishing

production, which takes place at the bone marrow, the main center, depends on various dividing abilities of special cells known as *stem cells*. The stem cell is charged with producing the blood cells needed in the body; and the production and work performed by this cell is literally amazing.

The Stem Cell: A Special Production Center

The determination of the stem cells in the bone marrow is quite astonishing. Only one out of every 10,000 cells produced in the bone marrow has the properties of a stem cell—a ratio that sometimes falls to as low as one in 100,000. In appearance, a stem cell has no difference from the other cells. Yet it is actually pretty special. It has highly sensitive and vital properties that enable us to survive. This special cell determines the requirements inside the body and then, thanks to its unique dividing ability, sometimes forms red blood cells and sometimes white blood cells—the main elements of the immune system.[4]

Why does only one out of 10,000 cells take such a decision and possess such ability? You may even be unaware of the existence of these talented cells in your body. This special cell possesses a particular ability to divide, determine the body's needs and give rise to entirely different cells because God so wishes it. This special cell's magnificent organization and abilities permit an endless circulation to take place. The liquid blood continues on its way, always carrying the same amount of blood cells.

Professor Curt Civin, an expert on oncology from

Johns Hopkins University who is known for his research into stem cells, describes this special cell thus:

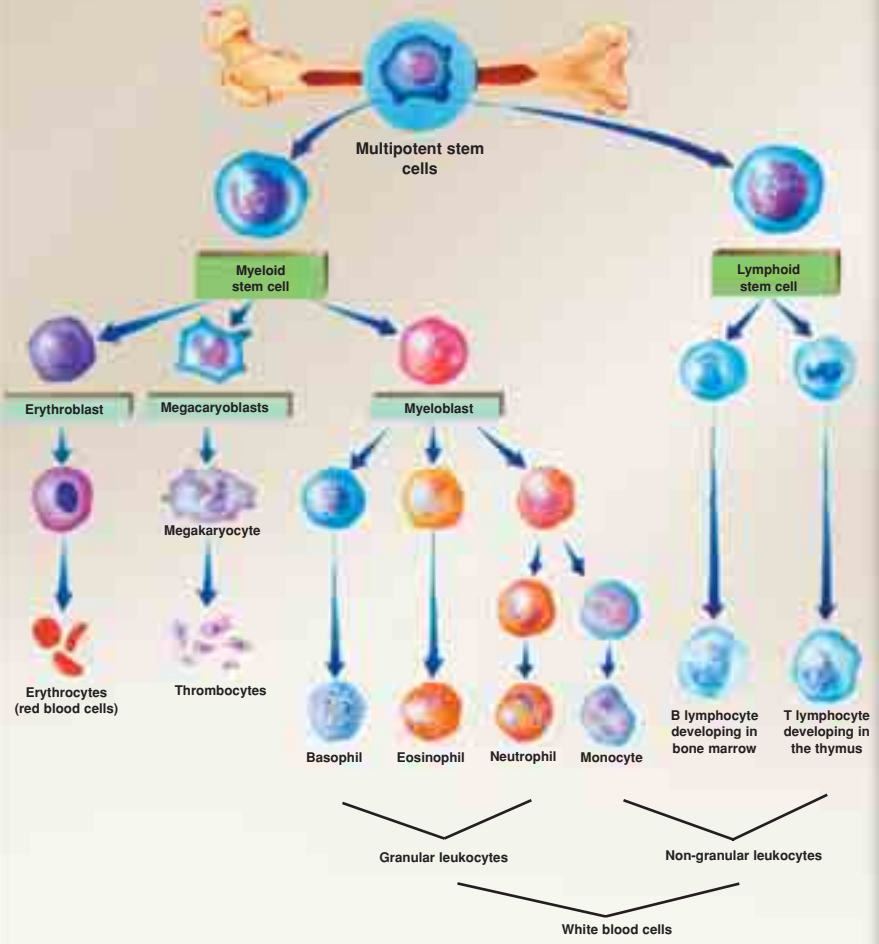
> *It's the ancestor, the parent of all. It's much like a fertilized egg, only it has fewer choices. It can divide and reproduce itself [self-renew] or it can differentiate into two types of cells, branching like a tree.*[5]

God has created the stem cell especially to be able to fulfill these important tasks. For example, the stem cell acts according to the various chemical and electrical signals it receives from its surroundings. Thanks to the signals that they send to the stem cell, damaged cells report the need for cell production in the body. The new cells produced by the stem cell set out for the site of the damage to replace the damaged cells. In this way, one single stem cell can produce all the different types of blood cells for weeks on end. Red blood cells lost due to bleeding, or white blood cells that die in their battles against infection are renewed and replaced exactly in the right amounts, neither too many nor too few, and exactly at the right time.

Our 21st-century biologists are still trying to decode the chemical language by which stem cells establish dialogue with other cells.[6] This process, performed many times at every moment by individual stem cells in the human body, still represents a puzzle for scientists.

How frequently this production should occur is another important question. White blood cells live for only a few hours. They digest a bacterium that has entered the body and soon die. Thrombocytes live for two weeks, and red blood cells for four months. All these cells constantly need to be renewed. Your bone marrow has to pro-

FROM STEM CELL TO BLOOD CELL



The stages by which the various blood cells form in the red marrow.
Multipotent stem cells develop into specialized stem cells known as myeloids and lymphoids. A myeloid stem cell can in turn develop into erythrocytes, thrombocytes and white blood cells (other than lymphocytes). The lymphoid stem cells permit the formation of lymphocytes, which play a major role in defense. Thanks to this deliberate differentiation of stem cells, blood cells with various functions are produced.

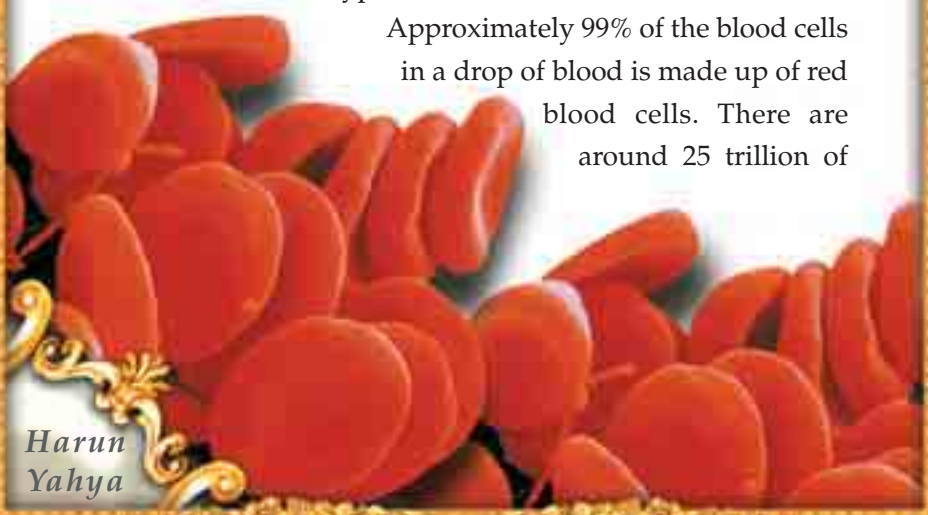
duce billions of cells every week. This production is made possible by the regulation and activities of a single main cell.[7] Considering its constant activity inside the body and the body's sensitive structure, the fact that this system—which both carries oxygen and protects the body by waging war against its enemies—is under the supervision of specially created cells, is of course considerable food for thought.

The way that an individual cell undertakes all the responsibility for production is of great importance, for it lets us grasp the incomparable beauty in God's creation. At the same time, this perfect system also definitely refutes the claims made by Darwinists, who seek to deny the truth of creation.

The Color of Blood: Red Blood Cells

Red blood cells, or erythrocytes, are the most numerous cells in the blood. Their job is to transport oxygen, the most essential material for the survival of all the body's cells. They go further than this, however, and in order to purify the body, also carry away the carbon dioxide that accumulates in the cells as a byproduct of metabolism.

Approximately 99% of the blood cells in a drop of blood is made up of red blood cells. There are around 25 trillion of



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these erythrocytes in our bodies. This figure is hundreds of times the number of stars in the Milky Way Galaxy.[8] To realize that the red blood cells in your body could easily cover half of a football pitch will help you grasp the magnitude of this number.[9] Stretched end to end, these cells would form a tower 50,000 kilometers (or 31,070 miles) high.[10] If we were able to spread the erythrocytes in the body out like a carpet, then these cells would cover an area of 3,800 square kilometers (or 1,467 square miles).[11] There are so very many red blood cells in the body that every second up to 3 million new red blood cells enter the bloodstream just to replace those that have died.[12]

Red blood cells are produced by the stem cells in the bone marrow, that rubbery tissue in the largest bones in the body. During its four-month lifespan, a single red blood cell travels between the lungs and the other tissues of the body 75,000 times before returning to the bone marrow. By the time you turn this page, you will have lost some 3 million red blood cells throughout your body. At the same time, a similar number will also have been produced in your bone marrow.[13]

Maintaining this equilibrium is most important. Blood cells that have completed their life spans are always replaced by new ones, because the bone marrow is in a constant state of production. Its cells begin this intensive process with the receipt of a chemical signal, and this production then comes to an end once the need has been met.

The chemical communication that brings this about is truly staggering to contemplate. Cells communicate by means of hundreds of different kinds of molecules. The message that needs to be transmitted to the

stem cell is attached to a protein and sent on its way. The target cell extends a protein receptor that will let the incoming signal be recognized. When this receptor binds to the protein carrying the chemical message, the information reaches the target cell.

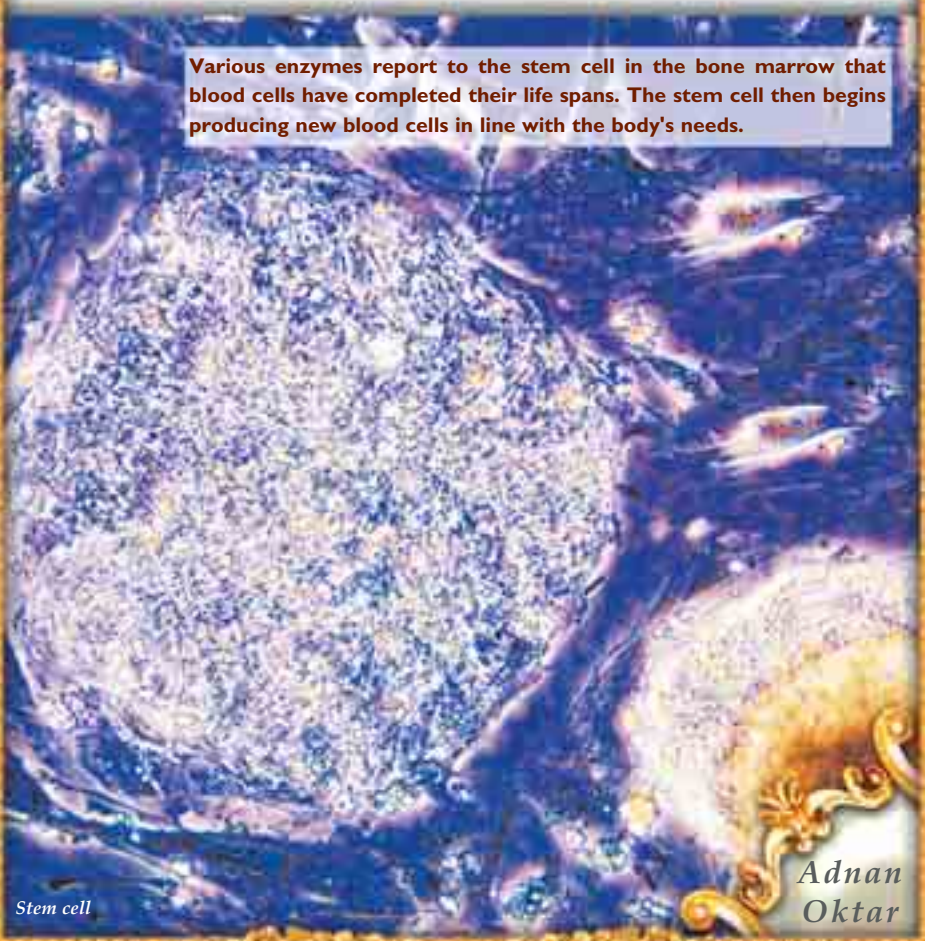
This process, briefly described here in just a few sentences, is actually far more complex. Today's scientists are still trying to unravel the secrets of this communication system. The "decision" by which stem cells send the daughter cells they have produced to the place in the body that requires them is one of the most important fields of present-day research.[14] The fact that this system in the body is of a complexity whose secret human beings have been unable to unravel is just one clear indication that it was created by Almighty God, Who possesses infinite wisdom.

How is it possible to produce the right amount of red blood cells in the body every second and then direct them confidently to the points where these new cells are needed? It is impossible for a lone independent cell in the bone marrow to know what is happening at the other parts of the body. The signaling system employed by those cells is also the most perfect communication network possible. This perfect structure is of course the work of God, Who knows all the processes taking place in the body, right down to the finest detail, and Who creates and constructs them in the first place.

Red blood cells are exceedingly small, because before entering the bloodstream, they expel most of their contents—their nucleus, mitochondria, ribosome and other organelles. They do this in a literally conscious manner, because they "know" they must absorb a mirac-

ulous molecule known as hemoglobin (about which, you'll find more details in the following pages). By expelling most of their organelles and picking up hemoglobin, red blood cells enable this molecule to perform its tasks in a reliable manner, during its lifespan of approximately four months.

The red blood cell membrane serves an important sheath for hemoglobin, which lacks a cell membrane of its own and is therefore exceedingly vulnerable. Thanks to various enzymes



Various enzymes report to the stem cell in the bone marrow that blood cells have completed their life spans. The stem cell then begins producing new blood cells in line with the body's needs.

Stem cell

Adnan Oktar

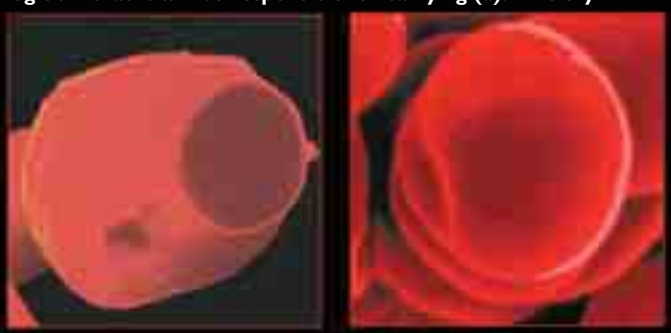
contained in this protective layer, hemoglobin is also protected against degeneration.[15]

Red blood cells have to open up a rather wide space inside themselves to make room for the nearly 300 million hemoglobin molecules that get packed into any single red blood cell.[16] These 300 million hemoglobin molecules will take up 90% of the space in a single erythrocyte.

Red blood cells are the only cells in the blood which have lost their nuclei. The organelles which they expel are immediately destroyed by the white blood cells, the body's disposal operatives. What is surprising is that despite being deprived of the nucleus, which carries all their data, red blood cells still preserve the enzymes and proteins necessary for them to survive without difficulty during their 120-day lifespan. Thanks to these special precautions taken for them throughout those four months, they are able to remain alive. However, they are now merely transporters that are unable to divide and hence, unable to reproduce themselves as ordinary cells do.

As this one example will show, there is an enormous complexity in the systems in the human body. Before you finish

Starting its life in the bone marrow, the young erythrocyte releases its nucleus and absorbs the hemoglobin that it will be responsible for carrying (a). This erythrocyte later assumes a disc-like form for traveling through the blood vessels, as shown in the picture (b).

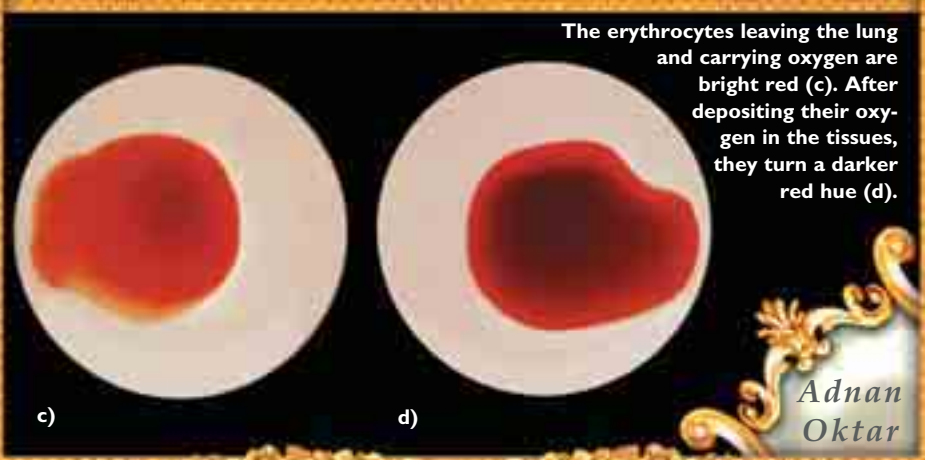


a) b)

Harun Yahya

this book, you will see a many astonishing details regarding the blood and the systems that it controls. The way that a red blood cell expels the organelles inside it, sacrificing its own nucleus—which contains all the essential data for its long-term survival; keeping only those elements necessary for it to live for a fairly brief length of time—is just one of those details. In order to be able to do all this, the red blood cell has to distinguish between necessary and unnecessary organelles during its short lifespan, know that it must absorb hemoglobin—and, even more crucially, be aware of the importance of hemoglobin for human life. If just one of these tiny details is neglected, if the red blood cell does not take hemoglobin into itself for example, then oxygen would not be distributed in the body.

We need to point out that this behavior—the red blood cell's essentially agreeing to its own demise—deals a severe blow to Darwin's theory of evolution. Charles Darwin assumed that all organisms wage war to ensure the survival of their descendants. Richard Dawkins, today's proponent of Darwinism, suggests that this struggle for survival can be



The erythrocytes leaving the lung and carrying oxygen are bright red (c). After depositing their oxygen in the tissues, they turn a darker red hue (d).

reduced even to the genetic level and that the genes of every living thing fight to ensure their existence. In fact, however, the erythrocyte, a living cell, behaves in a manner that is the exact antithesis of that hypothesis: It sacrifices itself by abandoning its nucleus and its genes. That is because it did not come into being by chance during any "struggle for survival" as Darwinists would have us believe, but was created with a specific function.

This function is never corrupted for as long as we live. God, Who has created everything totally flawlessly, has also created this special cell, which constitutes one of the countless proofs of His creation. In the Qur'an, it is revealed that God is the Lord of all:

> **I have put my trust in God, my Lord and your Lord. There is no creature He does not hold by the forelock. My Lord is on a Straight Path. (Surah Hud: 56)**

Red Blood Cells' Flattened Shape

The transportation of oxygen, as carried out by the red blood cells, is no ordinary process. No other type of cell is capable of carrying oxygen. With their unique shape, red blood cells have been specially created for this purpose. Being flat, round and depressed in the center, red blood cells are true marvels of engineering.

Many factors permit red blood cells to carry oxygen, but all of them are essential. One of them is their flattened shape. This shape increases the cell's surface area and facilitates contact with oxygen molecules, as well as making it easy for the cell to deposit oxygen at the right time

and in the right place. Thanks to its shape, the red blood cell can load up with far more oxygen molecules than it could if shaped like an ordinary cell, and is able to carry them more easily to the tissues where they are needed.

Red blood cells' flattened shape is also vital in terms of these cells' unimpeded passage through the tiny capillaries. They are the smallest cells moving in the bloodstream. This is of vital importance for them to carry oxygen to every point in the body. Sometimes, however, red blood cells find themselves facing capillary vessels of very minute dimensions. These veins, which can sometimes be only 5 micrometers in across, are too narrow for red blood cells with a diameter of 7 to 8 micrometers to pass through.[17] But red blood cells must pass

Despite being the smallest cells in the circulatory system, red blood cells still encounter some very narrow passages. The 5-micrometer-wide narrow tunnels represent very difficult tunnels for these red blood cells, approximately 7 to 8 micrometers in size, to pass through.

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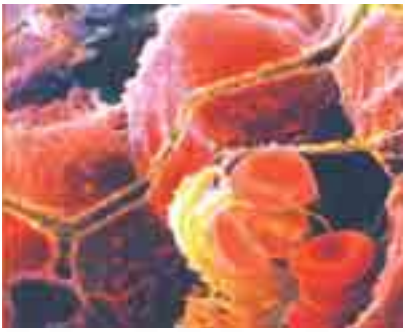
Red blood cells are biconcave and disc-shaped. Thanks to this shape, they can flex inside narrow blood vessels. Another reason for their elasticity, however, is the cell membrane. At left can be seen an electron microscope image of a red blood cell (magnified 200,000 times). The section indicated with arrows is the flexible cell membrane that lets the cell pass with ease along narrow capillary vessels. This feature of red blood cells is of great importance in order for the body's cells to obtain oxygen.

through these capillary vessels, since—as shall be explained in some detail—these exceedingly important blood vessels enable nutrients and oxygen to reach all individual cells in the body.

Yet red blood cells are too large to fit through these vessels. Under normal circumstances this should cause a problem. However, in line with the superior design specially imparted in them, red blood cells experi-

ence no such difficulty. They are flexible, and can assume almost every configuration. Since they possess a large cell membrane in proportion to the amount of volume they carry, they can easily change shape. Thus even if they enter areas where it would otherwise be difficult for them to move, their cell membrane does not stretch and tear, as it would in other cells.[18] This is a considerable advantage. These blood cells which are able to flex and change shape can pass through veins narrower than themselves.

This advantageous ability is doubtless a very special feature. God has created two such entirely different structures as hemoglobin and the red blood cell to be compatible with one another, and has equipped each one with features that enable them to act together. The flattened shape of the red blood cell is one of the most important evidence of creation. There is no doubt but that God has the power to create the size of the red blood cell to be able to fit through the capillary vessels. However, the existing structure has the ideal values for the human body. This is the work of Almighty God, Who identifies and determines the states of every organism throughout the course of its life, and Who creates it accordingly, from nothing.



Red blood cells, capable of bending and changing shape, can reach even the narrowest, farthest capillaries in the body. At the side, for example, are red blood cells carrying oxygen among the liver cells. Blood cells are able to reach everywhere in such vital organs, thanks to their special structure.

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To better understand the importance of this magnificent structure, it will be useful to consider the possible effects of any problem arising in it. If the shape or flexibility of the red blood cell is impaired, this means that nutrients and oxygen will be unable to reach the tissues—and those tissues that which the red blood cells cannot reach are condemned to die.

In order to grasp the importance of the cell's flat shape, consider the case of *sickle cell anemia*, a very serious disease that occurs due to an inherited defect in the shape of the red blood cells.

The cells contain an abnormal type of hemoglobin known as hemoglobin S. When exposed to low oxygen, this hemoglobin breaks down into elongated crystals, causing the red blood cell to assume a sickle-like shape. This altered shape causes the cell to transport insufficient oxygen. In addition, cells with these altered shapes cause congestion by accumulating in the veins. The spiked ends of the crystals that cause the sickle-like shape sometimes rupture the cell membrane.[19]

The symptoms of the disease are very serious. Severe pains and attacks occur in the bones, muscles or stomach, lasting for days or weeks. When the red blood cells cannot pass through the narrow retinal veins, vision defects or even blindness can occur. Functional defects in the liver may give rise to jaundice. Growth in childhood is retarded. The body becomes prone to infections. Most important of all, damage may occur to certain regions of the brain because of congestion in the small blood vessels, which can sometimes even lead to paralysis.

Within just a few hours, this disease can reach dangerous levels. People who develop sickle cell anemia at very young ages must receive special treatment throughout their lives if the disorder is not to prove


sickle blood cell

Above can be seen the capillary vessel network in the retina. To the side is a red blood cell deformed as the result of an inherited disease known as sickle cell anemia. These sickle-shaped cells lose their elasticity, so cannot pass through the narrow retinal blood vessels. This leads to vision defects, or even blindness.

fatal. To remind you, the sole cause of this is a defect in the shape of the red blood cells.

Perhaps the most astonishing claim regarding this disease comes from evolutionists, who maintain that it represents an alleged *proof* of the evolutionary process!

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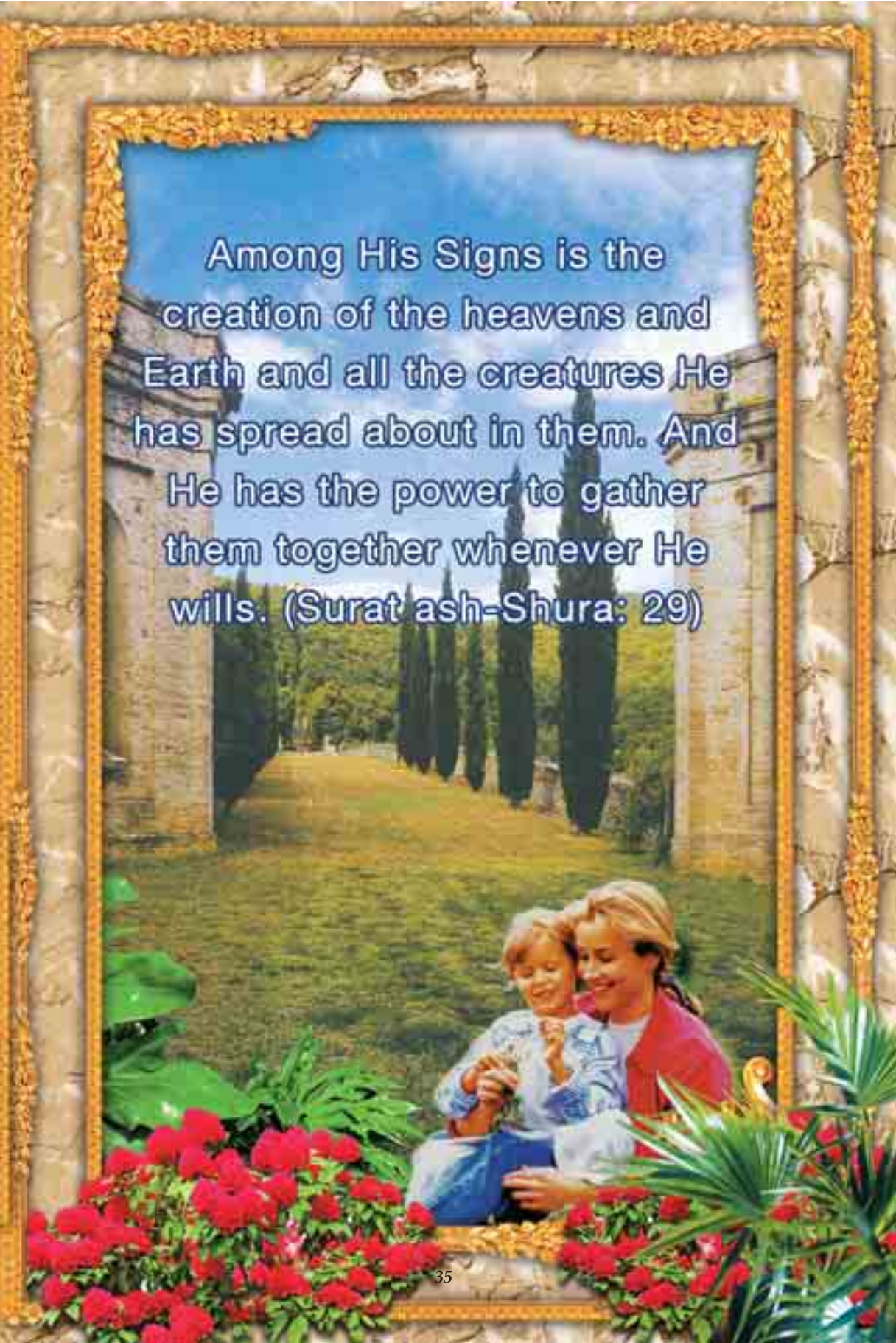
Evolutionists' Erroneous Theory About Sickle Cell Anemia

The theory of evolution ascribes the origin of living things to two natural mechanisms: Natural selection and mutation. Evolutionists expect that mutations will, bit by bit, create new biological structures. According to the theory, at least a portion of these random mutations must be *beneficial*, must add new genetic information to existing organisms, and must lead to the development of new organs and biochemical structures that did not exist before. These *beneficial* structures will then be favored by natural selection, and evolution will thus take place.

This scenario is utterly imaginary. The most serious problem the theory faces with is the fact that in the real world there are no *beneficial mutations.* Ever since the development of the science of genetics, Darwinist biologists have long sought some example of a mutation that would verify their claims. However, after lengthy studies and experiments, they have determined that every example of mutation—far from improving on living organisms—has actually damaged them, sometimes fatally, or, at the very best having little or no impact at all. Yet Darwinists do not give up, even in the face of all these failed experiments. They blindly continue to believe that mutations can be beneficial and can bring new, advantageous features to organisms.

To keep their beliefs alive, the evolutionists do not hesitate to claim that sickle cell anemia—a very serious and even fatal disease—is an example of a so-called *beneficial mutation*. The factor in this disease that deforms the hemoglobin was originally a mutation, which damages


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)

hemoglobin's ability to transport oxygen. Therefore—as we saw in the preceding pages—oxygen cannot be carried to certain cells, resulting in severe diseases, even fatal health problems.

In a most peculiar manner, however, some evolutionist biologists describe the mutation that causes this defect as *beneficial*. (This erroneous information is even taught in biology textbooks in high schools.) The basis of this claim is that the mutation concerned represents a defense against another disease—malaria. People suffering from sickle cell anemia receive two mutated sickle cell genes—one from their mother and one from the father. However, those who receive only a single mutated gene from either parent do not develop the disease, but become carriers. In such individuals, the sickle cell symptoms of the disease are not very strong. However, their carrying only a single mutated gene makes them resistant to malaria.

Malaria parasite attacks healthy, round blood cells, but does not attack blood cells in sickle form. For that reason, even if the malaria parasite enters the bodies of such individuals, it won't cause the disease.[20]

Evolutionists regard the way that the sickle cell provides a defense against malaria as an advantage, and describe the mutation that caused it as a beneficial one. However, this mutation—which leads to severe and even deadly damage in the body, due to the blood's inability to nourish certain tissues, and which spreads by being passed on to subsequent generations—clearly harms those who carry it.

Evolutionists ignore all these factors and appraise the partial immunity as a *gift* of evolution. This is of

MUTATIONS NEVER PROVIDE ADVANTAGES

healthy red blood cell

sickle cell

blood cell infected with the malaria parasite

Evolutionists point out that those who suffer from sickle cell anemia are resistant to malaria. They accept this as an advantage, and describe the sickle-cell mutation as beneficial. In fact, sickle cell anemia is a very severe and even fatal disorder, in which some organs and tissues cannot be adequately nourished. This disease can be passed along to one's offspring. It is absolutely impossible to view this disease as a *beneficial* mutation.

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course utterly nonsensical. According to that line of thought, one could claim that people born blind will not have to drive cars and therefore, enjoy a reduced risk of dying in traffic accidents. According to that irrational logic, being born blind could be regarded as a genetic *gift*. This is no more meaningless than evolutionists' interpretations of sickle cell anemia as a *beneficial* mutation.

David N. Menton, a professor of biology from Brown University, describes this so-called beneficial mutation as follows:

> *This mutation of blood hemoglobin is considered "good" because people who have it (and survive it!) are more resistant to the disease malaria. The symp-*

Evolutionists regard sickle cell anemia as a beneficial mutation. Their viewing an obviously harmful genetic disease as a proof of evolution shows how weak that theory really is.

toms of this "good" mutation include: acute attacks of abdominal and joint pain, ulcers on the legs, defective red blood cells, and severe anemia—often leading to death. One can only imagine what the "bad" mutations are like! No wonder that H. J. Mueller, who won the Nobel prize for his work on mutations, said: "It is entirely in line with the accidental nature of mutations that extensive tests have agreed in showing the vast majority of them detrimental to the organism in its job of surviving and reproducing—good ones are so rare we can consider them all bad."[21]

Another point regarding this claim made by evolutionists needs to be considered. The majority of carriers, who are not themselves affected by the disease, live in Africa, where the risk of malaria is very high. This allows any carrier of sickle cell anemia, thanks to the so-called beneficial mutation, to pass the defective gene on to his or her children. The spread of the gene in this way increases the next generation's chances of receiving a defective gene from both mother and father. Defective genes being received from both parents means that the child will inevitably suffer from sickle cell anemia. Or else if healthy genes are inherited from both parents, that person will not be a carrier and thus will have no immunity to malaria.

Indeed, sickle cell anemia, which develops with a change in just one of the 287 amino acids in hemoglobin, leads to the death of 25% of those who suffer from it.[22]

Dr. Felix Konotey-Ahulu, a world famous authority on sickle cell anemia and author of *The Sickle Cell Disease Patient*, says these on the subject:

If you are resistant to malaria, you are more likely to survive to pass on your genes. Nevertheless, it is a defect, not an increase in complexity or an improvement in function which is being selected for, and having more carriers in

the population means that there will be more people suffering from this terrible disease.[23]

Evidently, evolutionists are in a serious contradiction on the subject of the mutations, which they regard as a major mechanism in the emergence of new species. The way that they portray a genetic *disease* that is clearly harmful to humanity as evidence for evolution once again reveals the weak foundations on which the theory is constructed. It appears that the fanatical supporters of the theory, by now totally discredited, are desperately trying to keep it alive. Yet their efforts only serve to further humiliate the Darwinists.

Hemoglobin: An Extraordinary Molecule

You are probably unaware of the great efforts being made in your body to keep you alive. While you work, grow tired, sleep, eat or play sports, this feverish activity in your body keeps going non-stop. Molecules programmed to keep you healthy perform their duties without your being aware of them, never making a mistake, never growing bored, and never resting.

Hemoglobin, which gives your blood its red color, is just one of the countless molecules comprising the human body. Its vital function is to keep every cell in the body alive. Oxygen, which every cell needs is distributed, and the carbon dioxide that cells need to discard is picked up by hemoglobin.

On its own, just breathing is not enough to keep a body alive. It must somehow distribute the oxygen to 100 trillion cells, and pick up the carbon dioxide produced by metabolism. Our lives depend on the activity of this very complex micro-system. No scientific studies

have been able to develop any mechanism that's able to transport oxygen in the way that hemoglobin does.

It is an extraordinarily complex molecule with its own unique structure. With all its properties, this complex molecule is a miracle of Omniscient and Almighty God. In examining the features of this great miracle, we must always recall that God has the power to create splendid works, and that He has brought these structures and systems into existence in the bodies of all human beings.

Grasping this truth is one of the most important means of giving thanks to and praising Him. In one verse of the Qur'an God has revealed:

Hemoglobin, which gives blood its color, serves a vital purpose in loosely bonding with oxygen, which enables the cells to live, and distributing it throughout the body, and removing the carbon dioxide that those same cells give off.

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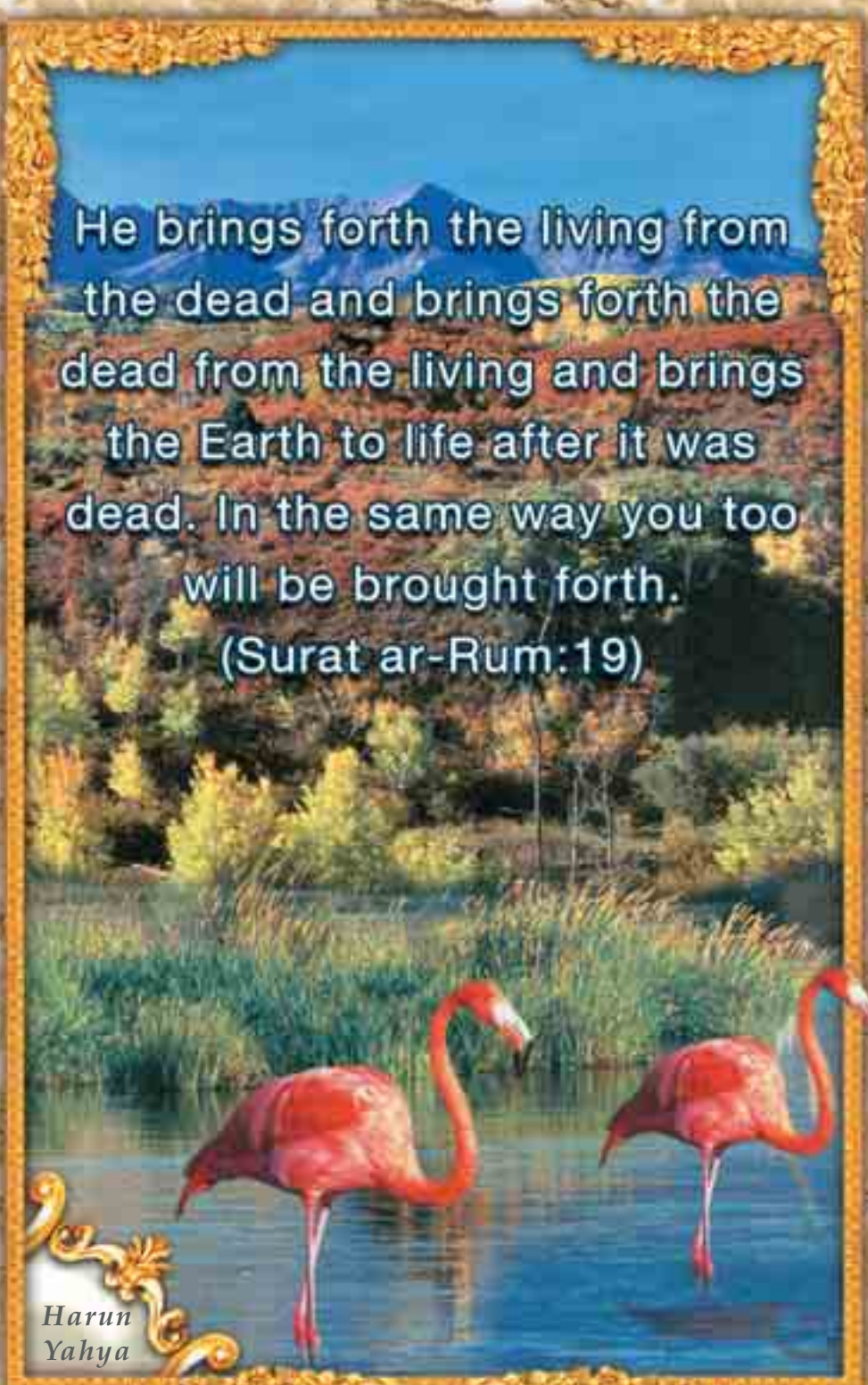

He brings forth the living from the dead and brings forth the dead from the living and brings the Earth to life after it was dead. In the same way you too will be brought forth.
(Surat ar-Rum:19)
Harun Yahya

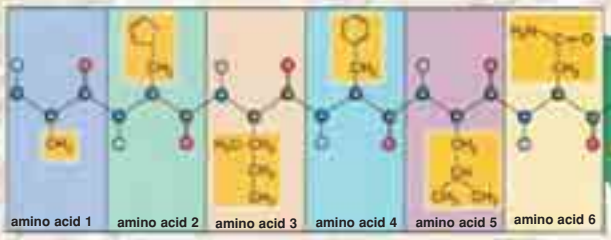
He is the Living—there is no god but Him—so call on Him, making your religion sincerely His. Praise be to God, the Lord of all the worlds. (Surah Ghafir: 65)

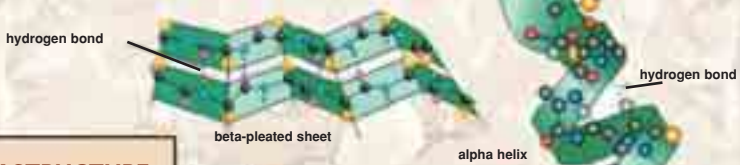
The Miracle Molecule that Carries Oxygen

Scientists' description of hemoglobin as an "extraordinary molecule" is based on the fact that it's able to perform different jobs at the same time. Hemoglobin selects oxygen from the millions of molecules passing through the capillary vessels in the lungs. This procedure is as stunning as it is intelligent. Hemoglobin literally catches oxygen atoms with its own unique process—which, however, must be carried out in a very sensitive manner, because the oxygen to which it binds possesses the property of *oxidation*, a destructive and toxic process that causes the molecule to lose its functions.

To protect against that danger, God has created hemoglobin with a magnificent property: As it transports oxygen, hemoglobin does not *fully* bind to it, but grabs the molecule from one end, just as if it were using a pair of tongs, and carries it to its destination in that manner. This method, doubtless, is very well-advised. Almighty God has created it together with this important precaution against the threat of oxidation.

Anyone who considers this with an open mind will clearly perceive the signs of creation here. There is no possibility that hemoglobin itself could have discovered the threat posed by oxygen and developed a countermeasure, all by using trial and error. Above all, we are talking about a mere molecule. This important security precaution, with all its complexity, was created at exactly the same

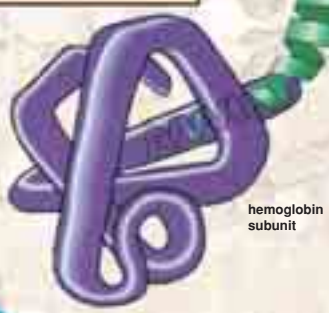


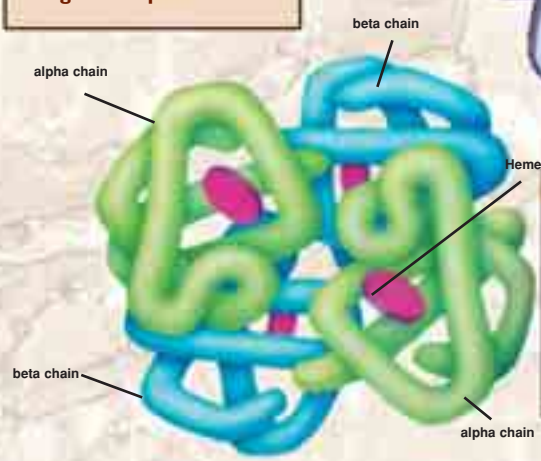


PRIMARY STRUCTURE
Determined by the number, type and order of amino acids, and forms a polypeptide.

SECONDARY STRUCTURE
Polypeptide can form a beta-pleated sheet or an alpha helix. Hydrogen bonds form between carboxyl and amino acids.

TERTIARY STRUCTURE
Occurs when the helix (or sheet) is folded in specific ways, and is characteristic of globular proteins.





QUATERNARY STRUCTURE
The folded protein chains may join to form a single protein consisting of several subunits. For example, the oxygen-carrying protein hemoglobin possesses two alpha chains and two beta chains.

The above diagram shows the phases through which hemoglobin forms. Hemoglobin has a very complex and perfect structure in order to be able to transport oxygen. Therefore, any change in its amino-acid configuration will make it lose its ability to transport oxygen.

time when hemoglobin first came into being. The biological details that permit hemoglobin to trap oxygen clearly reveal that no such mechanism could ever have come into being by chance.

The hemoglobin molecule contains a protein consisting of four chains known as *globins*. Each globin is bound to another molecule known as a *heme group*, which is exceedingly important in binding the oxygen to hemoglobin. Each heme group carries one ion of iron. This means that the four heme groups carry four iron ions. The iron ions bind to the oxygen in the lungs and then release it in the tissues.

Globin, however, also plays an important role in this process. As you shall soon see, globin's shape is an important control mechanism—and another matchless marvel of creation. In addition, the smallest change in this molecule's amino acid sequence entirely alters hemoglobin's ability to transport oxygen.

At the outset, while describing the features of the blood, you were reminded that every detail contains many other very different and complex sub-details. And the more one delves into the small components of the system, the more this complexity and variety increase. The way that God has created such details and complexity, while making all their existence essential to the functioning of the system, has left those unwilling to admit to the truth of creation with no alternative explanations to offer. Examples like this strengthen believers' faith in God. Since all these technical details reveal this complexity in great detail, they leave deniers in a state of doubt, whereas believers can rejoice in their trust and determination.

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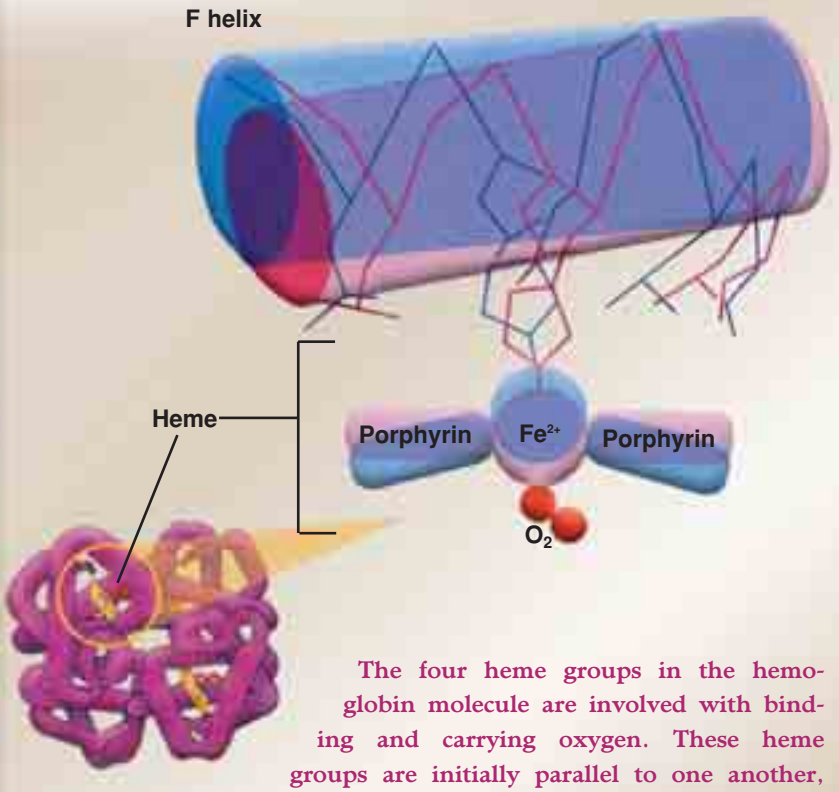
As we continue to examine the details of the system, you shall see that globin's very special shape controls the way iron binds to oxygen. The four hemes in the hemoglobin molecule are parallel to one another and vertical to the globin polypeptide chains. However, when the heme groups bind oxygen, this parallel alignment is lost. Even though the hemes are too far apart to interact direcly, changes that occur in the globin's structure that surrounds the heme when it picks up an oxygen molecule are transmitted to the other globins in this protein. Thus, the act of binding an oxygen molecule at one heme leads to an increase in the affinity for oxygen binding at the adjacent hemes.

It should also be noted that the globin keeps pairs of heme groups from coming too close together, thanks to which, an oxygen link that might otherwise form among the irons is prevented from doing so. If an oxygen link or "bridge" did form, then two valuable hemoglobin iron atoms would be oxidized.[24]

We may compare this to four separate magnets left hanging from a rod. Since the magnets' north poles are all adjacent, they will repel one another. If every magnet repels another one of the same polarity that approaches it, then we encounter a situation in which all these magnets seek to move away from one another and thus change their alignment.

When iron ions bind oxygen, they act just like magnets with the same polarity and try to distance themselves from each other as far as possible. In our analogy, the "rod" on which the magnets are suspended is the globin. The threads by which the magnets hang are the heme groups, and the magnets themselves are oxygen. The way hemo-

Hemoglobin was Created with the Necessary Precautionary Measures for Transporting Oxygen



The four heme groups in the hemoglobin molecule are involved with binding and carrying oxygen. These heme groups are initially parallel to one another, but when they bind an oxygen molecule they lose their parallel alignment and each causes changes in the structure of the globin surrounding it.

Globin prevents oxygen links from forming among the iron ions by the oxygen molecules' approaching one another. Thanks to this extremely important precaution, the two hemoglobin iron atoms are prevented from being oxidized. The approximately 270 hemoglobin molecules in every red blood cell take this important precaution constantly.

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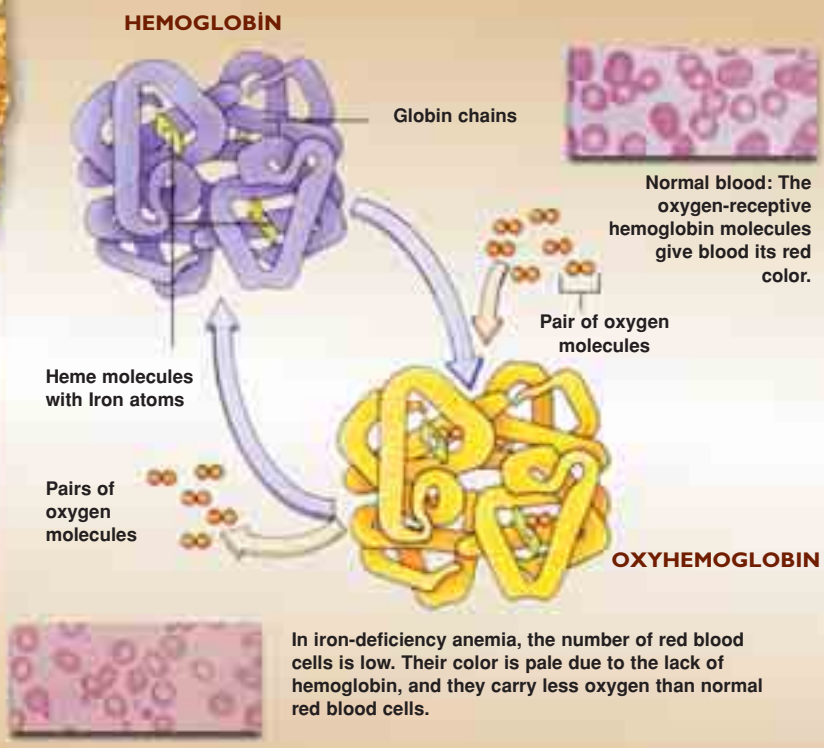
globin binds four separate oxygen molecules is clearly the creation of God to meet the body's oxygen requirements.

If you keep in mind that each red blood cell carries up to 270 hemoglobin molecules, the scale how each cell distributes oxygen in the body can be better understood. It is essential that this distribution system should have the perfect, special organization just described. It is as if the molecules in question were able to calculate the potential oxidation danger that oxygen molecules bring with them and behave in the awareness that therefore, they must move as far away from one another as they can.

More importantly, the same precaution has been taken in the trillions of molecules in every human body. That is because these are examples of God's creation, and are kept under His control at every moment. Each one is a manifestation of God's name of Al-Qadee (the Ruler; He Who completes His task). Like every other example of creation on Earth, they introduce us to the existence, infinite might and omniscience of God. Our Lord's superior knowledge is revealed in these terms in the Qur'an:

> **That is the Knower of the Unseen and the Visible, the Almighty, the Most Merciful. He Who has created all things in the best possible way. He commenced the creation of man from clay. (Surat as-Sajda: 6-7)**

Throughout this transportation, an exceedingly loose bond is developed between the hemoglobin and oxygen molecules, which bond is easily reversible at any time. That this loose bond is another marvel of creation becomes clear at the next stage, because in order for oxygen to be able to be deposited at the requisite tissues, it needs to be



Hemoglobin has a miraculous oxygen-carrying ability, that permits it to bind four separate oxygen molecules. It carries these molecules with great care throughout the circulatory system and deposits them in tissues that need oxygen.

able to separate easily from the hemoglobin. The loose bond between them facilitates this. If a stronger bond were to develop, then despite being transported throughout the body, the oxygen molecules could not be deposited in the tissues as the red blood cells carrying the oxygen passed by. That, in turn, would spell certain death for us.

The existence and breaking point of this loose bond has been determined sensitively. The environ-

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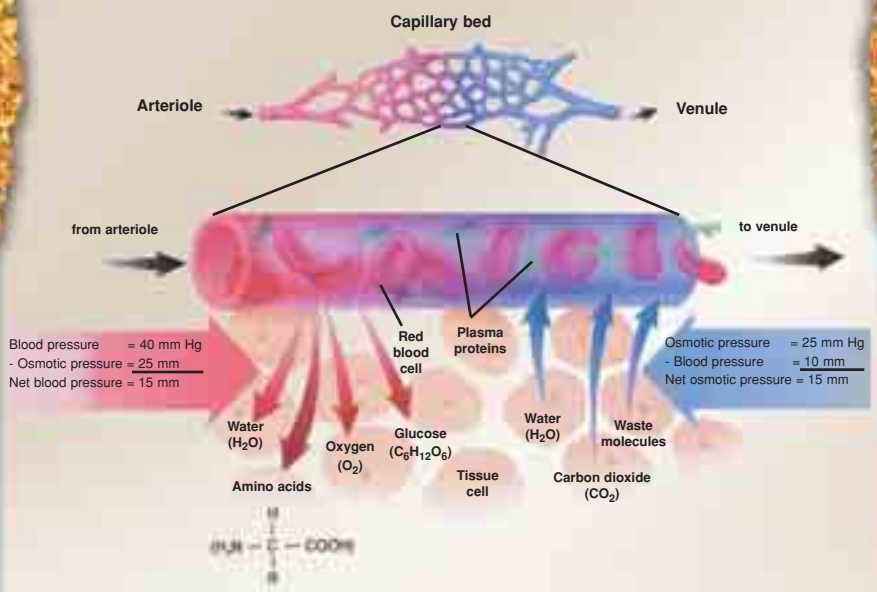
ment that allows the oxygen molecule to attach to the hemoglobin is high partial pressure of oxygen in the lung tissue. As the partial pressure of oxygen falls in other body tissues, the loose bond between the oxygen and hemoglobin breaks, separating the oxygen from the hemoglobin.

This mechanism forms the basis of the transportation of oxygen from the lungs to the tissues.[25] Such a mechanism has to operate constantly in the body. If the partial pressure of oxygen does not fall at the requisite time and place, then the tissues will be unable to take oxygen in, and a tissue deprived of oxygen will shortly die.

The same thing applies to blood pressure. A hemoglobin molecule can determine how much oxygen it will release to a tissue only when blood pressure is stable. This pressure in the blood can remain stable thanks to nitrogen monoxide, another molecule carried by the hemoglobin molecule in addition to oxygen and carbon dioxide. If hemoglobin did not also carry nitrogen monoxide, then the blood pressure would constantly

Thanks to the nitrogen monoxide it carries, hemoglobin "knows" how much oxygen to release in which tissue. The nitrogen monoxide transported by hemoglobin ensures that blood pressure remains stable throughout the body. The amount of oxygen that needs to be released in the tissues is determined by the blood pressure.



The above diagram shows the exchanges that take place between the capillaries and tissues. At the arterial end of the capillary, blood pressure is higher than osmotic pressure—thus water, oxygen, amino acids and glucose tend to leave the bloodstream. At the venous end of the capillary, however, the situation is exactly reversed: Osmotic pressure is higher than blood pressure. Therefore, water, carbon dioxide and other waste molecules tend to enter the bloodstream. This perfect process, arising from pressure differences, enable oxygen and nutrients to be distributed throughout the body and waste products to be removed.

vary. Either insufficient oxygen would be provided to the requisite tissues, or else too much.[26] This would mean that the tissues would either burn out from too much oxygen or die from too little.

All this information about the hemoglobin molecule confirms that its structure was especially created for life. Thus, this molecule represents a major dilemma for Darwinists, who ascribe the development of life on Earth entirely to coincidences. If Darwinists are to insist that hemoglobin is the product of chance-based mutations, then they must explain how the genetic information of the hemo-

globin molecule, which enjoys such a sensitive chemical harmony with oxygen in the body, came into existence—and also how living things with circulatory systems managed to breathe before that genetic information enabled oxygen to be carried to their tissues.

Above all, the presence of hemoglobin is essential to the proper function of blood, and it cannot be expected to form and reach perfection *gradually* in any oxygen-breathing organism by means of random mutations. If hemoglobin had not possessed a very special structure with which to combine loosely with oxygen and thus transport it to the tissues, then to collect waste products in the tissues and deposit them back in the lungs, then blood circulation would have been useless. This shows us that in addition to such exceedingly complex tissues as the heart, venous network and blood, the circulation of the blood must have emerged together with special molecules such as hemoglobin right from the outset. To state that another way, the origin of the circulation of the blood obviously is not the end result of evolution, but of creation.

To every question of *how* and *why* in the living world, the answer will be a clear exposition of the fact of creation. Therefore, Darwinists can never explain how the complex structure of life emerged. Every work that appears before them is a creation of God, Who has the power to do whatever He wishes. This fact is revealed in the Qur'an:

> **... I swear by the Lord of the Easts and Wests that We have the power. (Surat al-Ma'arij: 40)**

In terms of both its structure and its functions, hemoglobin is a very special molecule. If hemoglobin were not so weakly bound to oxygen, and had not possessed, right from the beginning, the special structure that lets it transport that oxygen to the tissues, collect waste products from the tissues and deposit carbon dioxide in the lungs, then blood circulation would be useless. Hemoglobin was no doubt created at the same moment with the other elements of the circulatory system. To put it another way, the origin of the blood's circulation lies not in evolution—this system is just another proof of our Lord's superior creation.

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The Miracle Molecule Carries Carbon Dioxide

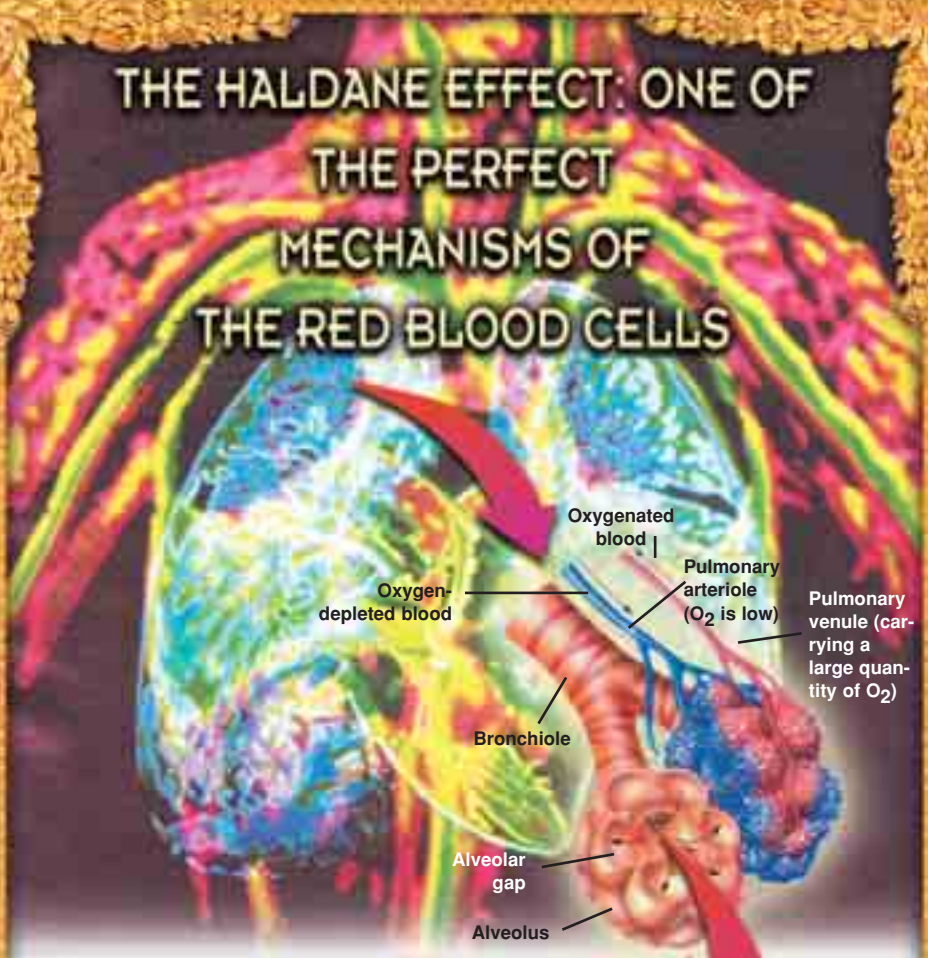
It's not only hemoglobin's oxygen-carrying ability that represents an insoluble dilemma for Darwinists. Hemoglobin also possesses the ability to collect the carbon dioxide molecules from the cells.

The transport of carbon dioxide in the blood is not as risky as carrying oxygen. For that reason, red blood cells can carry much larger quantities of carbon dioxide than they can of oxygen. During rest, 100 milliliters of blood carries an average of 4 milliliters of carbon dioxide from the tissues to the lungs. While the oxygen-carrying hemoglobin imparts a red color to the blood, on its return to the lungs hemoglobin loaded with carbon dioxide loses its bright color and assumes a dark reddish shade, akin to purple. That is why the veins close to the skin surface appear dark red or even blue.

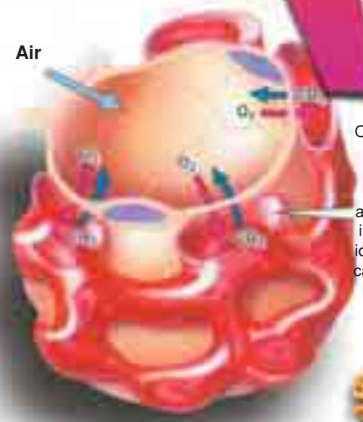
The blood generally carries carbon dioxide in the form of carbonic acid. An average of only 5% is forwarded to the lungs by binding itself to hemoglobin. Another 10% of carbon dioxide is in a dissolved gaseous state.

Carbon dioxide attaches to hemoglobin with a rather weak bond. Once again, oxygen is the main factor at the stage of its being released from hemoglobin. In this chemical phenomenon, due to the hemoglobin's one particular property known as the Haldane effect, when oxygen binds with hemoglobin, carbon dioxide is released. When the tissues need oxygen, the Haldane effect separates hemoglobin from oxygen and causes it to bind more carbon dioxide. In the lungs, the same property has an opposite effect. There, where the level of oxygen is higher, oxygen behaves most expertly

THE HALDANE EFFECT: ONE OF THE PERFECT MECHANISMS OF THE RED BLOOD CELLS



When the tissues need oxygen, the Haldane effect allows hemoglobin to release oxygen and bind with carbon dioxide molecules. In the lungs, the Haldane effect exhibits the exact opposite transfer, and the sites where hemoglobin exchanges oxygen and carbon dioxide are determined with perfect sensitivity.



Oxygen transported by the red blood cells' hemoglobin passes from the alveolus to the capillary. Carbon dioxide passes from the capillary to the alveolus.

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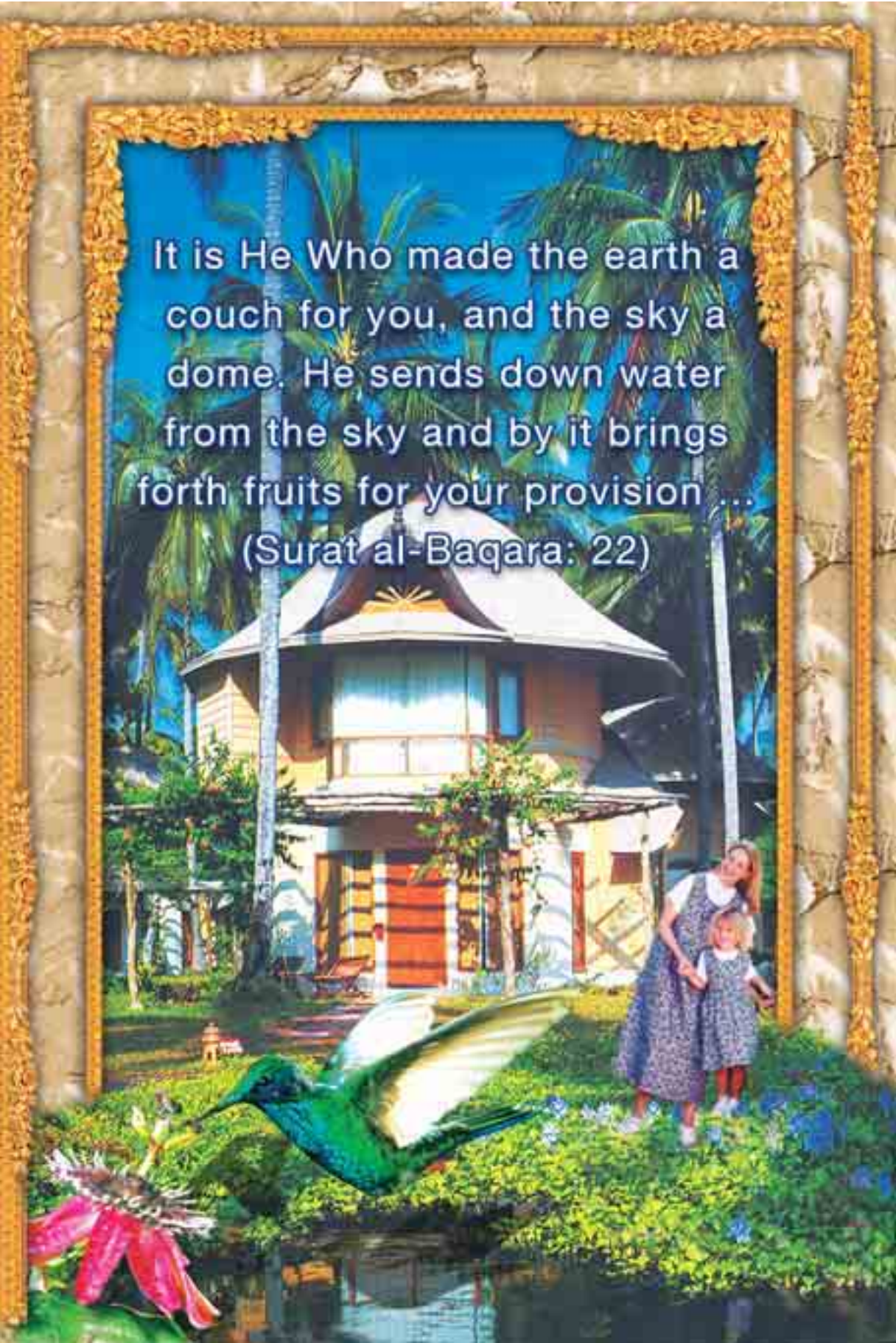
in binding with hemoglobin, and the higher acidity of the oxygenated hemoglobin promotes dissociation of carbon dioxide from the hemoglobin to which it is attached.[27]

This chemical process is exceedingly complex. The point that needs emphasis is that the sites where hemoglobin exchanges oxygen and carbon dioxide have been determined with the greatest sensitivity. Hemoglobin must release oxygen in the tissues and load up with carbon dioxide, and in the lungs—the exit point for carbon dioxide—the reverse of this exchange takes place. This exchange takes place nowhere else in the body. The chemical balance that maintains this cycle has to be fully functional at the same time as the circulation of the blood, and cannot possibly have evolved gradually, over the course of time, through random mutations.

Sometimes hemoglobin in the blood binds with carbon monoxide instead, generally through external influences, in a phenomenon known as carbon monoxide poisoning. If carbon monoxide (CO) gas from the incomplete combustion of coal or car exhausts is inhaled, it binds to hemoglobin and thus replaces the oxygen that is—or will be—attached to the hemoglobin. Hemoglobin is more "attracted" to carbon monoxide than it is to oxygen, and binds to it 500 times more tightly than it does to oxygen. If enough CO is inhaled, this can lead to death from oxygen deprivation.[28]

The Miraculous Iron inside the Hemoglobin

The iron in hemoglobin, which plays a major role in the process of oxygen transport, is one of the great miracles created by God. Iron, which enters the body by vari-


It is He Who made the earth a couch for you, and the sky a dome. He sends down water from the sky and by it brings forth fruits for your provision ...
(Surat al-Baqara: 22)

ous means and is absorbed from the small intestine, combines with *apotransferrin*, the iron transport protein, and is then transported in the blood plasma. Iron binds loosely to apotransferrin and can be released at any point in the body and in any tissue cell. The absorption of iron by the cells is to a large extent controlled by apotransferrin, which not only carries the iron molecule in the blood, but also deposits it by entering the cell.

After the liver has become saturated with iron, the liver produces less apotransferrin. In other words, the liver determines the body's need and regulates production accordingly, reducing the iron transport process in the bloodstream.[29]

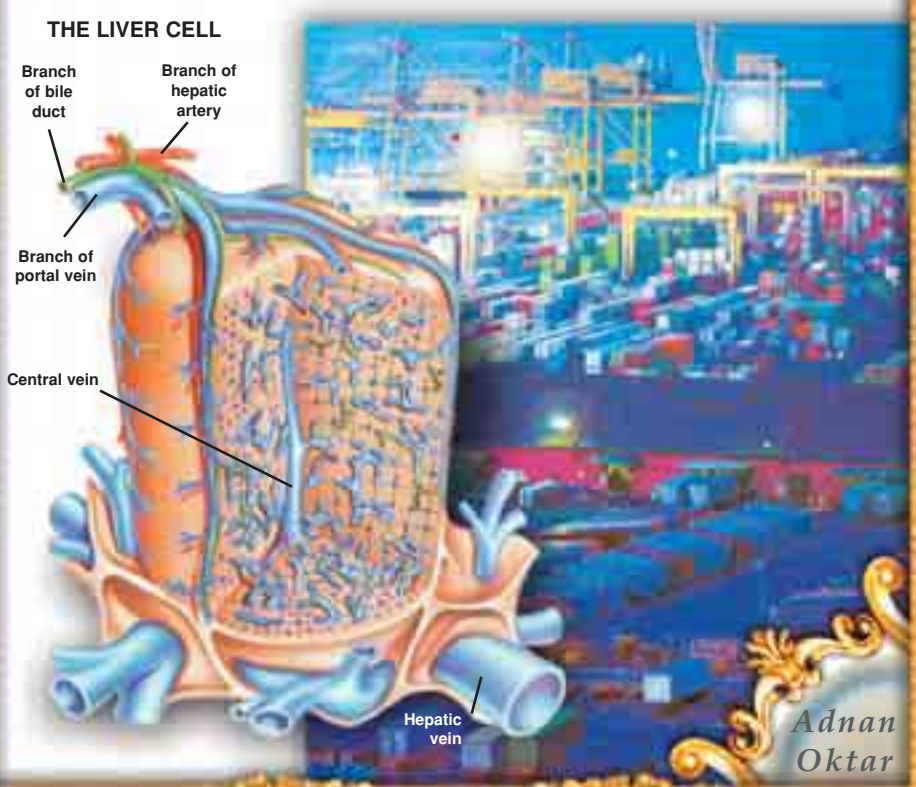
In this situation, we once again witness the presence of a highly regulated communication system within the body. An excessive accumulation of iron in the tissues would lead to the most severe disorders. However, through the control mechanism created by God as a blessing, the level at which production needs to be carried out is clear. This sensitive measurement is constantly performed in the body, to determine which of the 100 trillion cells in the body stands in need of how much iron.

Requirement-based production is at the same time a saving of effort, since the rate of iron absorption in the body is rather slow—at most, just a few milligrams a day. This means that even if the body takes in excessive amount of iron through the nourishments, only a small part of it will actually be used.

The remainder is not wasted, however. Even if the body no longer requires the excess iron ions floating in the bloodstream, they are stored for later use. All the cells in the body, especially the liver cells, store this excess iron

within themselves, just as if they knew it was to be needed at a later date. The fact that the cells are seemingly aware of this storage process is of great importance. No cell uses the iron that reaches it at random, aimless and unbounded. No cell throws iron ions away, making a decision different from that of all other cells. They all act as if they were aware that they held a most valuable commodity. This shows us that there is a

Only a small part of the iron taken into the body is absorbed. The remainder, which is of the greatest importance to the body, however, is never wasted. The excess iron ions are stored by certain cells, as if the body knew that they would be used later. One of the organs that perform such storage functions is the liver. The liver cells work literally like a warehouse, storing excess iron for use at a later date.



flawless planning inside the cells, a plan kept under constant control. Clearly this planning and control belong to God, Who maintains and rules all, and is the Creator of the flawlessness in this wondrous system.

It is of course impossible for us to view the presence of God. However, anyone possessed of reason and good conscience can see and comprehend God's absolute and mighty existence by looking around him at examples like this. The proofs of God's existence are obviously everywhere. Our Lord describes His superior artistry in one verse as follows:

> **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: 64)**

The Miracle Molecule That Defies Darwinists

Darwinism maintains that living things emerged and developed through two natural mechanisms: natural selection and mutation. In fact, however, it is impossible for either of these mechanisms to bring into being a new species or to contribute any new feature to one. (For further information see, Harun Yahya, *Darwinism Refuted*.) Yet all Darwinian sources tell us how all organisms are the product of these two blind mechanisms. Looked at more carefully, however, there is not the slightest information in these accounts regarding what the mechanisms in question have achieved.

For that reason, therefore, every evolutionist publication you may read or broadcast that you might watch is purely speculative. For example, an article "documenting" how a marine creature must have begun turning into a land dweller through various mutations may be adorned with long sentences and scientific terminology. Yet you can never find in any evolutionist account the answers that really need to be provided: Where and how did the mutations in question arise? What effects and changes did they cause in living things? And by what stages did they come about? That is because evolutionists are well aware that if they did undertake to describe these imaginary stages, they would have to confess that there is no such thing as evolution.

Evolutionists' accounts regarding hemoglobin also conform to this same pattern. You cannot find a single account concerning the alleged evolution of this miraculous molecule that goes any further than pure conjecture.

With its complex structure and the different forms it exhibits in different species, hemoglobin constitutes a serious dilemma for evolutionists. In his book *The Great Evolution Mystery*, the evolutionist geneticist Gordon Rattray Taylor makes the following admission:

> *Hemoglobin makes a haphazard appearance in the evolutionary story, appearing in many different phyla. It is found in some species of paramecium (very primitive single-celled creatures known to every school biology class). It is found in worms, mollusks, insects and even in the roots of leguminous vegetables. What it is doing in all these places is largely unexplained. One thing seems clear, that it was invented time and time again, quite independently.*[30]

This fact that Taylor had to admit despite being an evolutionist is actually of the greatest importance. The way that hemoglobin assumes different forms in different species, and the fact that these forms do not fit into any imaginary evolutionist schema, shows that this important molecule was created specially and separately for every group of creatures. The truth that Taylor prefers to describe as "being invented independently" is in fact the *truth of creation.*

That same fact is detailed by the professor of biochemistry Michael Denton in his book *Evolution: A Theory in Crisis:*

> *There is not a trace, at a molecular level, of the traditional evolutionary series: fish to amphibian to reptile to mammal. Incredible, man is closer to lamprey [in his hemoglobin] than are fish!*[31]

Moreover, as in all other complex organisms, hemoglobin's complex structure is too sensitive to permit any random mutations. If the amino acid sequence that forms the hemoglobin protein is damaged, nothing remains but a useless mass of amino acids. The chances of this

molecule coming into possession of this particular amino acid sequence is 1 in 10^{950}—in other words, impossible!

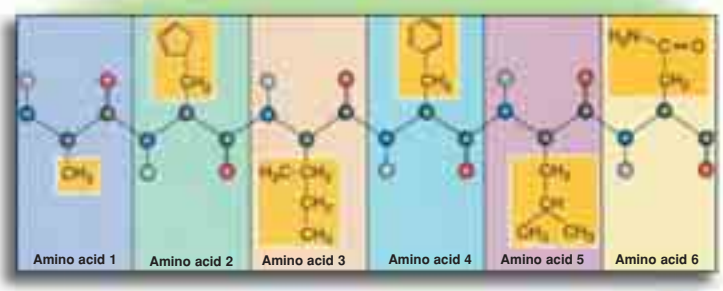
Murray Eden from the Massachusetts Institute of Technology (MIT) comments about this subject:

Hemoglobin has two chains, called alpha and beta. A minimum of 120 mutations would be required to convert alpha to beta. At least 34 of those changes require changeovers in two or three nucleotides. Yet, if a single nucleotide change occurs through mutation, the

Hemoglobin molecule

As in all other biochemical structures, the complex structure of hemoglobin is too sensitively balanced to tolerate any randomly occurring mutation. Any accidental chemical change in its structure would immediately turn this valuable protein into a functionless assortment of amino acids.

amino acid sequence of the hemoglobin molecule



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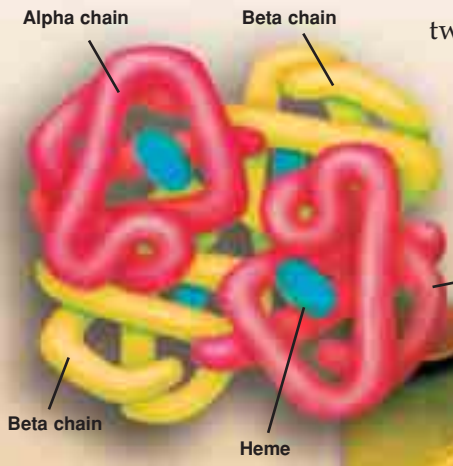
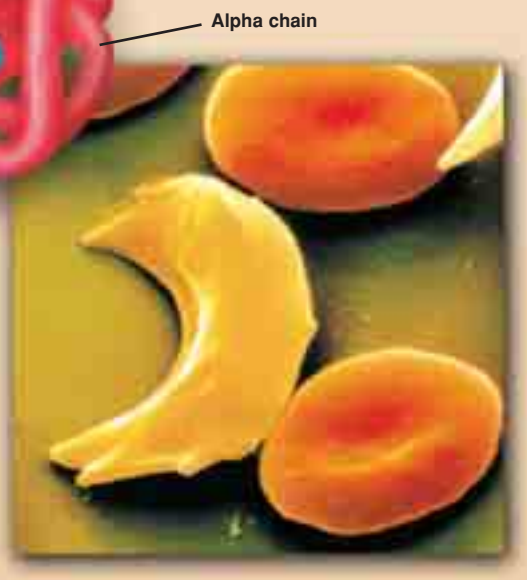
result ruins the blood and kills the organism![32]

If you randomly remove one of the amino acids that constitute hemoglobin, or randomly switch the positions of any two of them, then the protein may either become defective or else lose most or all of its function. The best example of this is sickle cell anemia, which has already been discussed in previous pages. The sole cause for the occurrence of this disease, which has very grave symptoms and for which a cure has not yet been found, is that just two of the amino acids in the sequence constituting hemoglobin have changed places. This disease manifests itself when just two of the 287 amino acids that go to make up hemoglobin are in the wrong place. Nobel Prize-winner Prof.





At least 120 mutations are necessary in order for the alpha and beta chains that comprise hemoglobin to turn into one another. However, a variation in just one amino acid in this sequence may destroy the blood cells. The cause of sickle cell anemia is just one such mutation.

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George Wald says this on the subject:

> *If just one mutational change of any kind was made in it, the hemoglobin would not function properly. For example, the change of one amino acid out of 287 in hemoglobin causes sickle-cell anemia. A glutamic acid unit has been changed to a valine unit—and, as a result, 25% of those suffering with this anemia die.*[33]

Darwinists seek to portray evolution as a theory backed up by powerful evidence, even as the truth. But the fact is that just a single hemoglobin molecule, created by God with an incomparable organization, with its complexity and distribution among species that refute the so-called evolutionary "family tree," is sufficient to put the theory into an impasse.

Myoglobin: The Muscles' Source of Oxygen

Another molecule in the body undertakes the function of carrying oxygen to the muscles. Known as myoglobin, this molecule bears a close structural resemblance to a subunit of hemoglobin, with the distinguishing feature that unlike hemoglobin, it can carry a single oxygen molecule. Myoglobin is specially created for the muscles, because the muscles' oxygen needs are at a lower and specific level. By carrying just one oxygen molecule rather than four, myoglobin is better able to meet the muscles' requirements. However, this does not apply to the other cells in the body. It is essential that the blood carry large amounts of oxygen to the other tissues every moment—which requirement is met by hemoglobin, able to bind four oxygen molecules.

If this distribution of tasks were reversed, then myoglobin would be unable to distribute sufficient

oxygen in the body, and hemoglobin would carry too much oxygen to the muscles, which would cause them to exhaust themselves. But neither hemoglobin nor myoglobin carries oxygen to wrong locations in the body. These molecules fully discharge their duties under the command of God, the Almighty Lord of the worlds.

In one verse it is revealed:

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)

Evolution's Groundless Claims Regarding Hemoglobin and Myoglobin

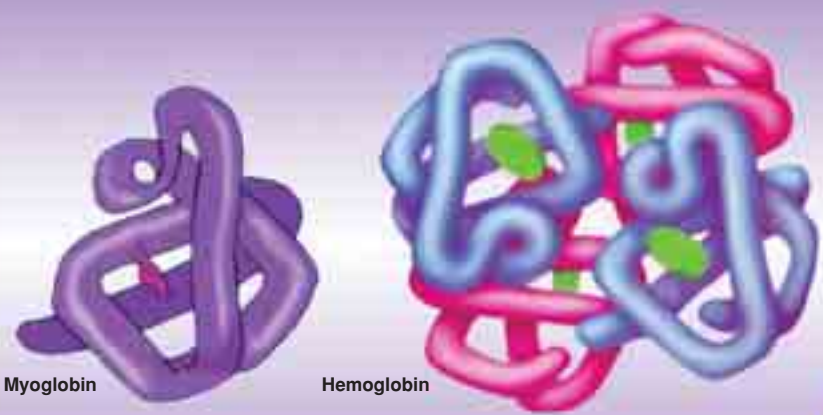
The hemoglobin and myoglobin molecules, which perform similar functions, also have the similar molecular features. Their heme groups are no different from one another, and their chains fold in the same way. Evolutionists regarded this similarity as evidence for their theory, and in 1959 declared that these two molecules were "related."

But many structures in nature are molecularly similar. Two molecules differentiated by only a single atom can constitute two entirely different structures. Indeed, even if the atoms are the same and only the bonds between them are different, one molecule can constitute a delicious food and the other can form a tree branch. Hemoglobin and myoglobin are two different molecules with almost identical properties. True, they have similar structures. Yet it is irrational to suggest that hemoglobin "evolved" from myoglobin. Like every other evolutionist claim, this idea is

supported by no scientific evidence whatsoever.

Evolutionists claim that by gradual mutations over time, the myoglobin molecule turned into hemoglobin. However, both hemoglobin and myoglobin are special molecules with exceedingly complex structures, performing very complicated chemical processes. Any mutational effect on these molecules—even a small change—can lead to a serious defect in the structure. The sequence in the myoglobin molecule is so sensitive that even a controlled intervention, let alone random mutations, can leave the molecule functionless. In addition, in order to be able to confirm evolutionists' claims, every intermediate stage between myoglobin and hemoglobin would

TWO MARVELS OF CREATION: MYOGLOBIN AND HEMOGLOBIN



The muscles require less oxygen than other cells in the body. For that reason, a different molecule has been created to distribute oxygen to the muscles. While hemoglobin meets the tissues' needs with the four oxygen molecules it carries, myoglobin gives life to the muscles with its one oxygen molecule. This special organization is a flawless creation of God.

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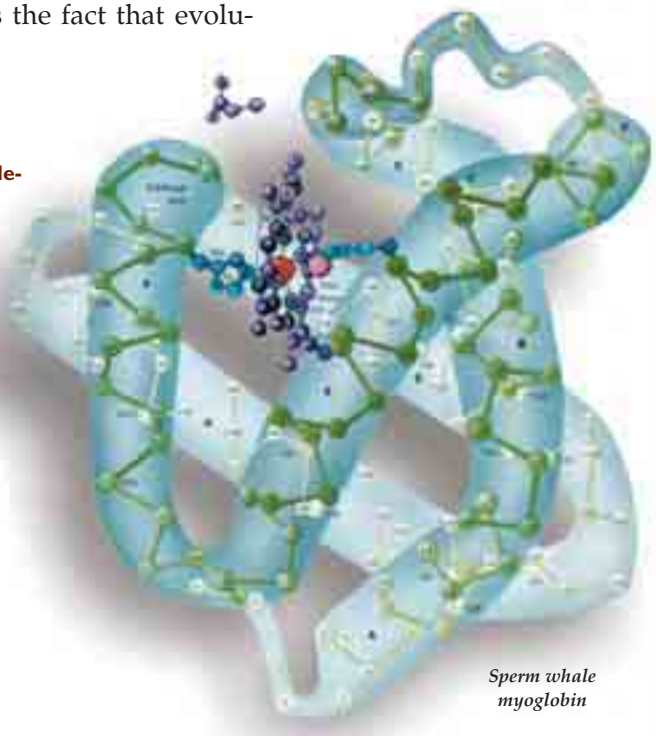
have to be fully functional (and even more beneficial than the stage before it). Yet no such "intermediate form" can be discovered or even described.

In addition to all this, it's erroneous and deceptive to describe hemoglobin as a "developed" form of myoglobin. Myoglobin is a special structure able to carry a single oxygen molecule to nourish the muscles. The fact that it has different properties from hemoglobin and prevents the muscles from over-oxidizing proves that it was created. As stated earlier, the distribution of oxygen to muscles in different quantities than to the other cells is one sign of creation in the human body.

Another major deficiency regarding this claim is the fact that evolu-

The myoglobin molecule is especially created for distributing a single oxygen molecule. Any random interventions in that molecule will damage it and cause it to become non-functional.



Sperm whale myoglobin

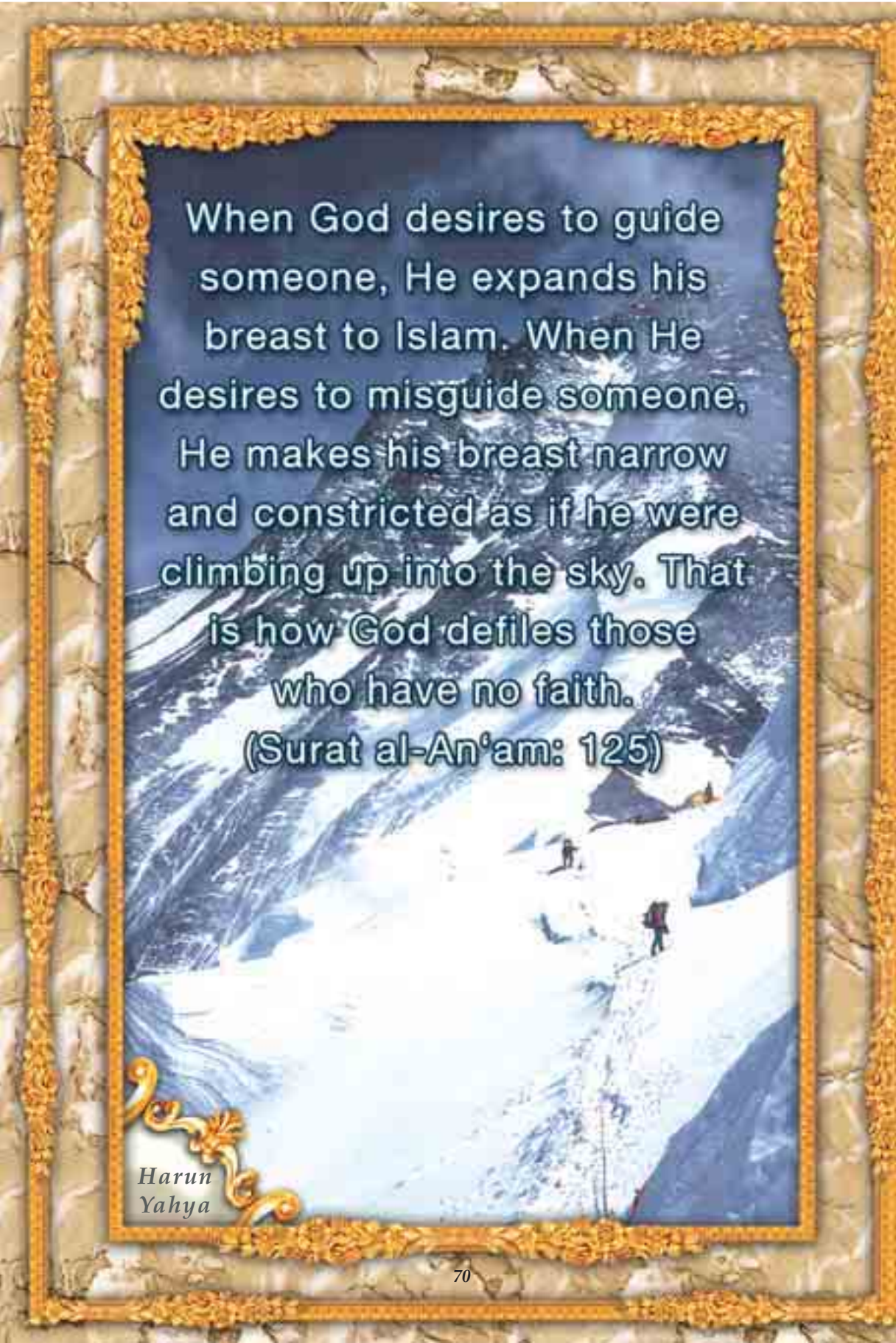
tionists have not yet accounted for the origin of the myoglobin, which they claim came to form hemoglobin.

Red Blood Cells Determine Needs

Red blood cells are seemingly aware of the importance of what they do. They constantly travel through the body, identify needs and take precautions when they encounter any situation out of the ordinary. For example, they deposit oxygen when they pass by a hard-working tissue in need of it. They transfer the requisite oxygen to that tissue, pick up the carbon dioxide given off from the oxidation of sugar—the body's basic nutrient—carry the carbon dioxide to the lungs, where they again bind oxygen.

In this exchange, there is a very delicate equilibrium whose details have already been touched on. Wherever there is a need for oxygen, that is where the red blood cells go. They also determine whether there is a need for more red blood cells in the body. The importance of this regulation is crucial. By means of this most careful regulation, your cells and thus, the structures in your body are kept from dying from oxygen starvation.

The changes taking place in your body when you climb a high mountain are also the result of this regulation. The reason is that the higher you go, the harder it is to obtain oxygen. The atmosphere is 21% oxygen, which is more concentrated at lower elevations, due to the higher air pressure. Your lungs will initially have difficulty in adapting to a thinner air. As you ascend, you will become increasingly lethargic, unable to walk, tired and even faint. That is because


When God desires to guide someone, He expands his breast to Islam. When He desires to misguide someone, He makes his breast narrow and constricted as if he were climbing up into the sky. That is how God defiles those who have no faith.
(Surat al-An'am: 125)
Harun Yahya

your body and your brain cannot obtain sufficient oxygen for you to live in the healthy manner you did before.

This problem is resolved, however, thanks to certain support features imparted in the human body by God.

First of all, in such an oxygen-poor environment, your body sounds the alarm. Its first precaution is to check whether the most critical tissues, particularly the brain, are receiving enough oxygen to keep working efficiently. Since the brain uses 20% of all the oxygen taken in the body, it constitutes the main organ the body must protect. The respiratory system and the arteries have been created to perform this function.

Most blood vessels near the heart are equipped with biological "meters" that are very sensitive to any drop in oxygen pressure. This subject, whose details shall be examined in due course, is evidence that God has created all things in great harmony. The lung muscles, stimulated by the nerve cells, increase the breathing rate so that more air reaches the lungs. That is why you find yourself out of breath at high altitudes. Meanwhile, the brain, equipped with its own unique meter, sends messages to the heart, telling it to beat faster and more powerfully so that what oxygen the blood does contain should reach the tissues more quickly.

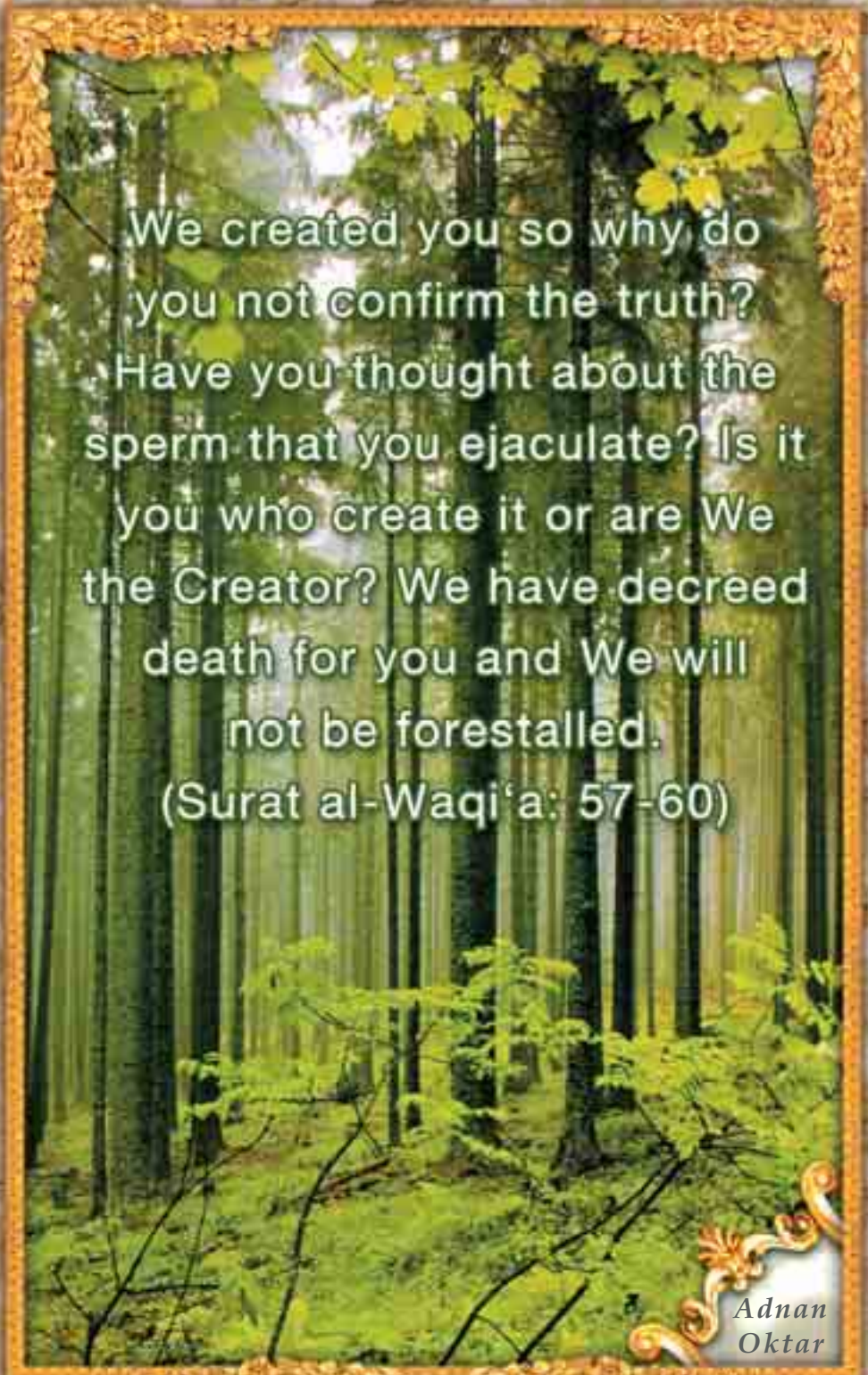
These measures are all temporary. Were it not for them, you would not be able to long withstand this change in metabolism, and would suffer excessive fatigue. While all this is going on, a more permanent solution occurs behind the scenes.

There is less oxygen available in low-pressure air. To catch this limited oxygen supply, the production of extra red blood cells shortly begins. A few hours

after the period of discomfort when you climbed the slopes of a mountain and felt yourself short of breath and even about to faint, your body decides to make permanent adaptive measures for its new environment. A hormone known as *erythropoietin* starts to be secreted by the kidneys, and partly by the liver. This hormone stimulates the bone marrow to produce more red blood cells. New cells, or the *support forces*, will enter the bloodstream in 3 to 5 days. But after 15 days, the production of erythropoietin decreases, because your body has adapted to the new high-altitude environment and is no longer in a state of emergency.[34]

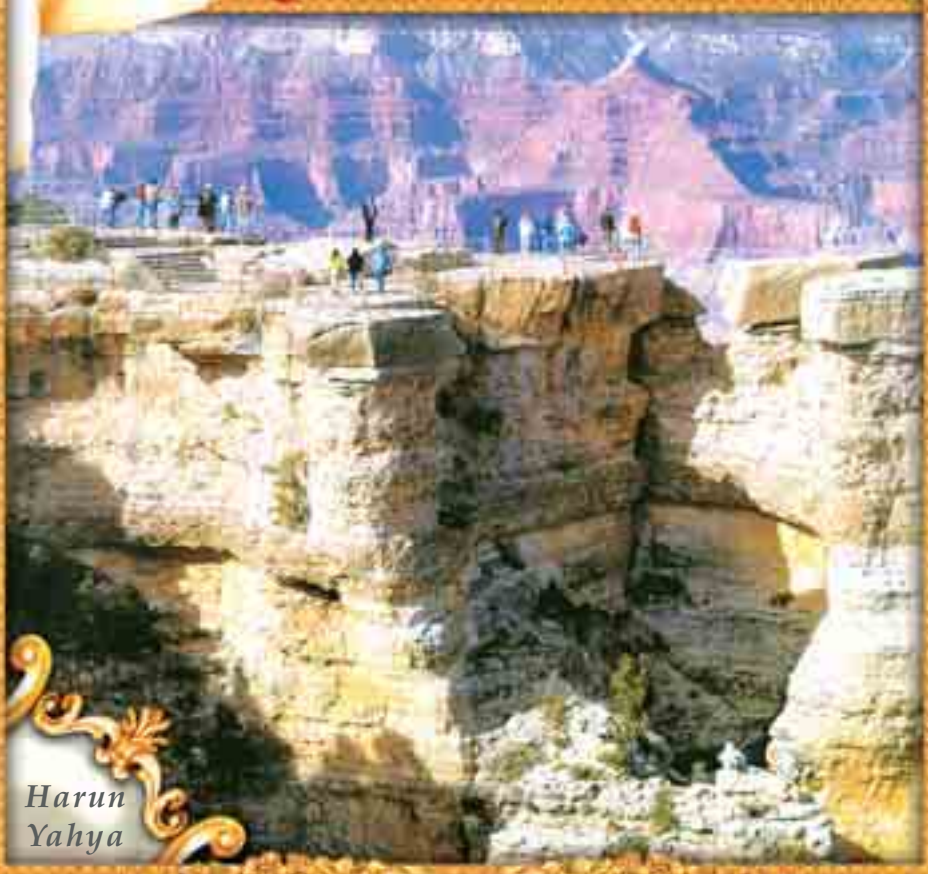
This adaptation is really astonishing. People living between sea level and altitudes of 1,800 meters (5,900 feet) above sea level have around 5 million red blood cells in one drop of their blood; whereas those living at higher altitudes, for example at 4,200 meters (13,780 feet), have some 7 million.

As altitude increases, the red blood cells in the body undergo various chemical changes that enable them to carry more hemoglobin than before. Furthermore, the hemoglobin in the red blood cells begins to be produced in such a way as to load and deposit oxygen more quickly. The other organs and tissues adapt to these most rational precautions in line with the altitude. In order to reduce the level of oxygen carried to the muscles as much as possible, there is a perceptible contraction in muscle size. Thanks to this impeccable system, you adapt to the new environment 15 to 20 days after first feeling a light headache. Your pulse returns to normal and there is no longer any need to take deep breaths to feel comfortable.[35]


We created you so why do
you not confirm the truth?
Have you thought about the
sperm that you ejaculate? Is it
you who create it or are We
the Creator? We have decreed
death for you and We will
not be forestalled.
(Surat al-Waqi'a: 57-60)
Adnan
Oktar

Is it you yourself who undertakes this magnificent control? Many people who reach the fainting stage from a lack of oxygen are quite unaware of these perfect rescue mechanisms within their own bodies. So who provides it? Could such a sensitive system as this have been established over time through random mutations, as Darwinists suggest? The sys-

At higher elevations—at 4,200 meters (13,780 feet), for example—the body will have 7 million red blood cells in one drop of blood. That increased number of red blood cells, much greater than normal, is a precaution taken to ensure the survival of humans in attitudes with low levels of oxygen.



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tem is so perfectly equipped and behaves so deliberately that any rational person will easily recognize the presence of a Creator here. The organs that carry out red blood cell production, the tissues that take precautionary measures, the heart and veins that cooperate to protect brain function, the stimulants that command enzyme production, the kidney and liver

People living at 1,800 meters (5,900 feet) above sea level have only 5 million red blood cells in one drop of blood. This level in such oxygen-rich regions is sufficient for the body's normal functions.

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that produce the necessary enzyme, the cells in a constant state of activity and superb coordination, and every protein, every enzyme, every molecule and every atom are all extraordinary. There never arises any confusion in the body.

All this extraordinary activity is the matchless and flawless artistry of God. He has created all things, and rules all places and all things. All things on Earth, and all things within this system, are under His knowledge and control. God is the Ruler, the Director, Who governs all of creation with order and balance (*al-Mudabbir*). Every work on Earth is His manifestation and obeys Him, because God is the true Lord of the universe. His creation belongs to Him, as does its management.

The brain uses approximately 20% of the oxygen that the lungs take in. When oxygen deficiency occurs, the brain is the first organ that needs to be protected. The heart and respiratory system possess various features specially created to protect the brain as a matter of priority. By means of various precautions, the oxygen taken into the lungs is first sent to the brain via the bloodstream.

God reveals this major truth in verses:

That is God, your Lord. There is no god but Him, the Creator of everything. So worship Him. He is responsible for everything. Eyesight cannot perceive Him, but He perceives eyesight. He is the All-Penetrating, the All-Aware. (Surat al-An'am: 102-103)

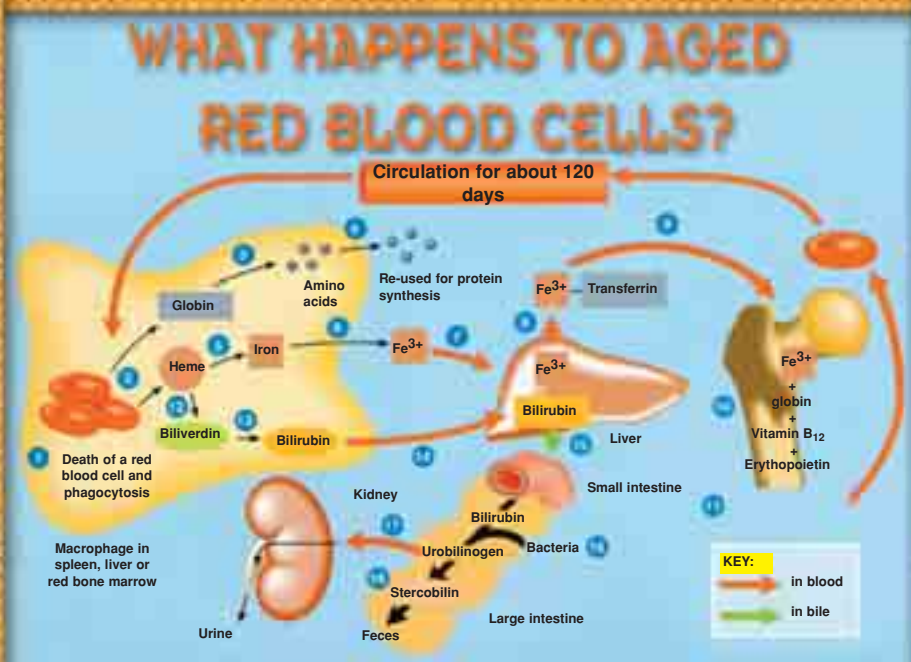
Red Blood Cells at the End of Their Life Span

As they near the end of their 120-day odyssey in the bloodstream, red blood cells become less active. As these cells grow older, they become more vulnerable. Their increasingly sensitive cell membrane can tear while passing through narrow points in the circulatory system. Their 8-micrometer diameter is especially damaged while passing through the 3-micrometer diameter of the red splenic pulp. As a result of this constriction, a large amount of red-blood corpuscles are found in the spleen tissue. (When the spleen is removed from the body for any reason, the numbers of abnormal and elderly cells in the blood will rise, since the natural filtering in question does not take place.)

Red blood cells that have come to the end of their lives are broken down by macrophage cells in many regions of the body, particularly in the liver, spleen and bone marrow. During this process, the hemoglobin in the deceased red blood cell is released. Over the next few hours, the macrophages separate the iron from the hemoglobin to be carried in the bloodstream—either to the bone marrow for the production of new red blood cells, or to the iron storage

areas in the liver and other tissues, for use at a later date. The macrophages convert the rest of the hemoglobin molecule into a bile pigment.[36] In conclusion, the cells' broken-down components are stored in various regions throughout the body for subsequent recycling, with none of them being wasted.

Who felt the need for such a storage system, and why? The



Red blood cells that come to the end of their lives are broken down by macrophage cells, particularly in the liver, spleen and bone marrow. Macrophages release the iron from the hemoglobin into the blood to be sent to storage. The rest of the hemoglobin molecule is turned into a bile pigment. None of the remnants of the cell are wasted, but are sent to various areas of the body for recycling.

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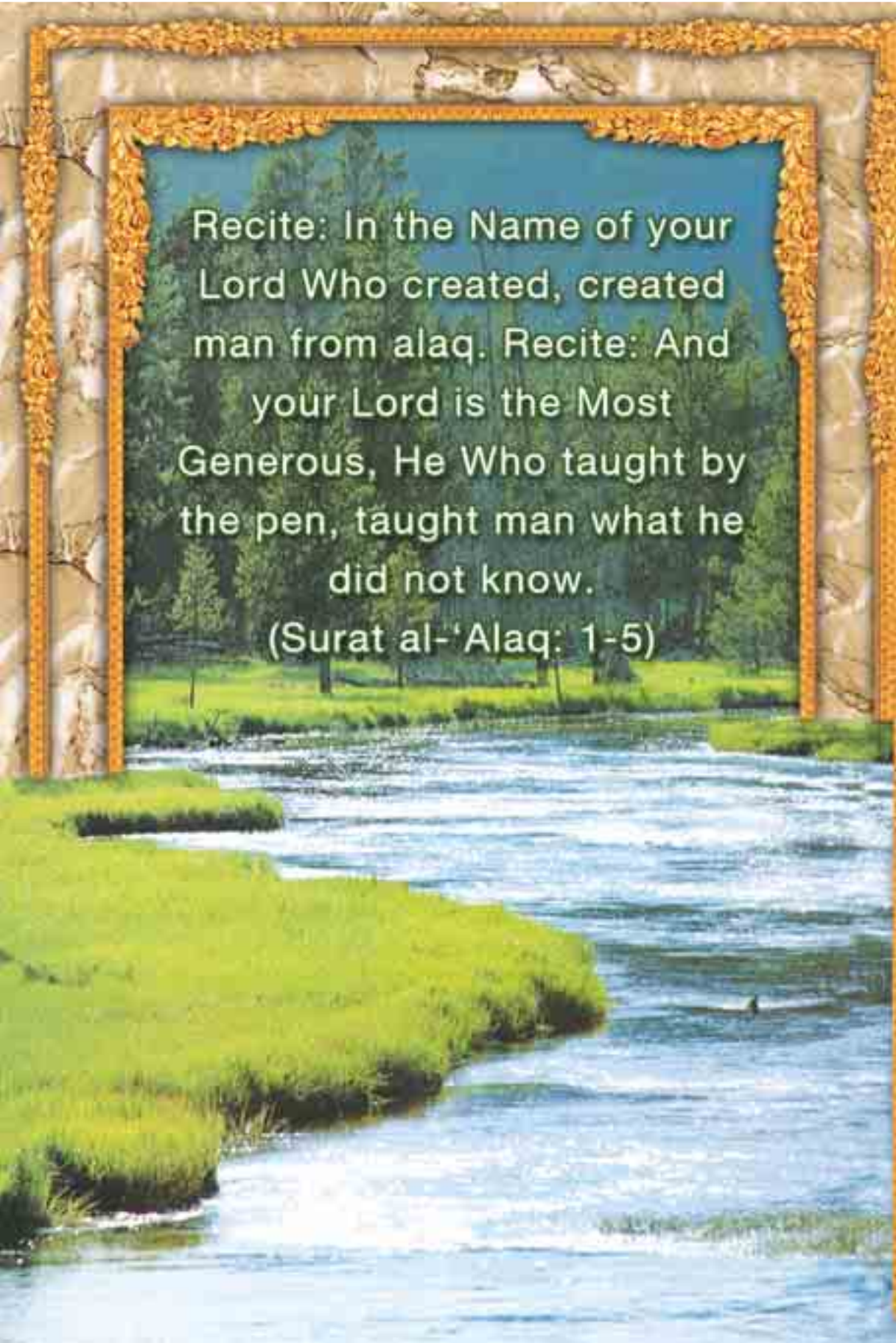
body's components are mere molecules and atoms. How did they learn to eliminate waste products and store substances of value to the body, such as iron, for later re-use? There is evident planning among them. Clearly, there is a Will that decides that red blood cells should be broken down at specific times, and which entrusts this task to the macrophages. That Will is our Lord God's, Who manifests Himself to us through the works He creates. One way of knowing Him and comprehending His might is to think about the details in the entities He has created. All these marvels we examine in the human body are evidence that we are created by God.

Even the slightest flaw that might arise in this division of labor within the body can lead to severe disorders, and even death. That being so, could all these phenomena have come about gradually, by means of random mutations? Such an event is of course impossible. In the absence of the enzymes that enable iron to be recycled, the body will suffer an iron deficiency. If the hormones that ensure the production of red blood cells fail to do their job, then the level of red cells in the blood will continue to fall. Many systems such as this must work together in close coordination. Therefore, it's essential that all of the system's components need to be present and fully formed in order for it to function. In fact, all the components necessary for the system to function are present in your body. This is just one of the miracles by which God reveals His might.

Therefore, Darwinists' nonsensical claims to the effect that living things came into being gradually and through chance phenomena are completely groundless, as they are on so many other assertions. A red blood cell that


Recite: In the Name of your Lord Who created, created man from alaq. Recite: And your Lord is the Most Generous, He Who taught by the pen, taught man what he did not know.
(Surat al-'Alaq: 1-5)

carries life to other cells of the body has to exist together with the bone marrow that produces it, the macrophages that break it down, the hemoglobin within it that binds oxygen, the blood plasma in which it's carried, and the blood vessels that transport it to all the cells. It also requires the enzymes and hormones that allow it to multiply and decline in number, and of course the heart, the pump that helps it move in the first place. The absence of just one of these factors will render the red cell useless, serving no purpose at all. It is impossible to speak of coincidences or any imaginary process of "evolution" in the functioning of this perfect system.

Every process that takes place in the body, every division of labor, and every enzyme that helps perform these functions have all been created by God and are subject to the Creator's commandments. This has been so for every human being who has ever lived, and the evidence of this magnificent creation can also be seen at every moment by every person alive today. Seeking to offer alternative explanations besides creation is a most irrational endeavor, and one condemned to failure.

That is because God's matchless artistry is plain for all to see, as is revealed in these terms in the Qur'an:

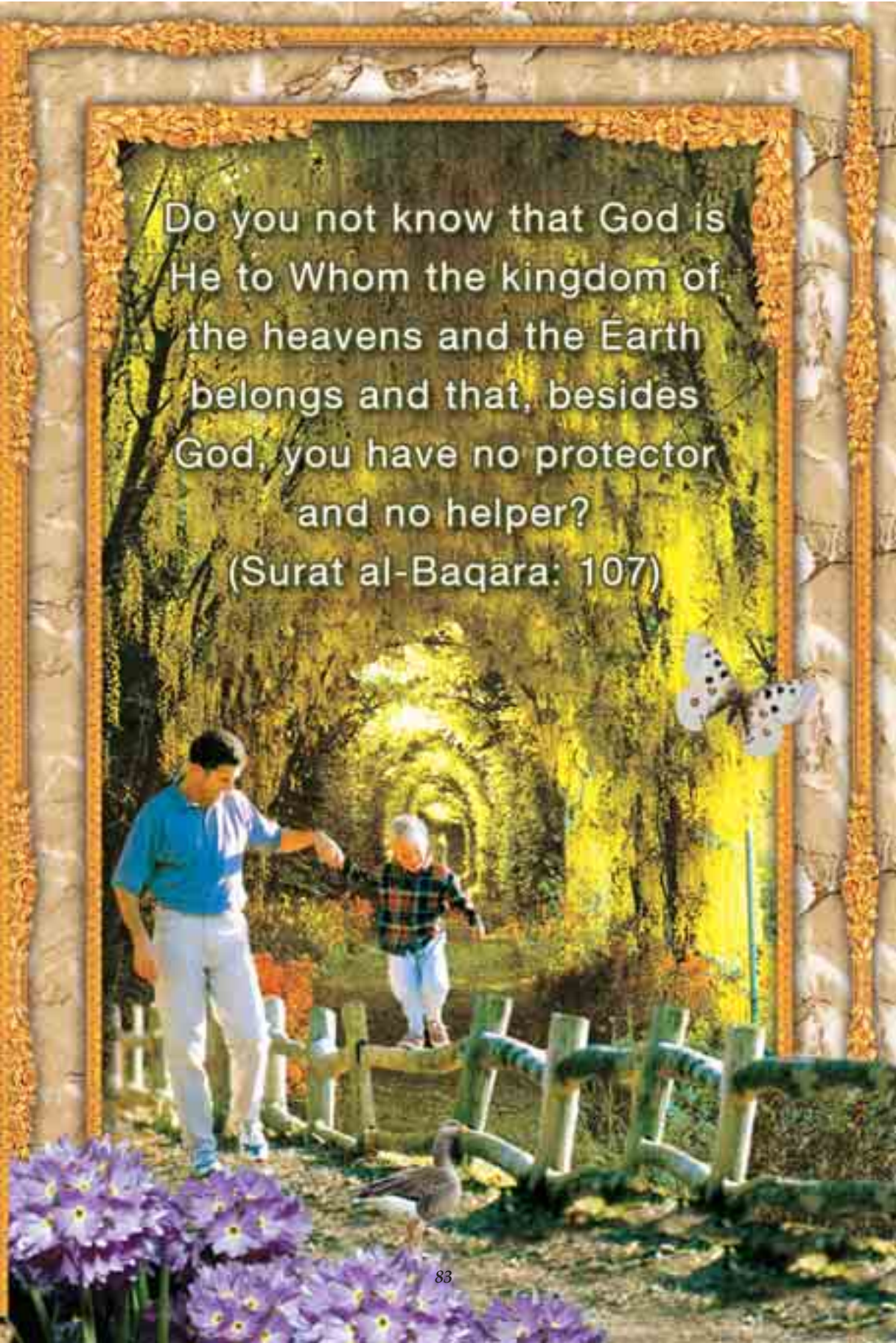
> **God is the Creator of everything and He is Guardian over everything. The keys of the heavens and Earth belong to Him. It is those who reject God's signs who are the losers. (Surat az-Zumar: 62-63)**

White Blood Cells: A Matchless Defense Force

Do you realize how many foreign substances there are in a delicious meal you eat, the air you breathe, and the people you shake hands with? Sometimes, even the water you drink contains germs that can make you ill and viruses that can go into action at any time. Yet you will not even be aware of the presence of these often poisonous substances that enter your body, dozens of times a day.

The reason for this is the existence of an army specially charged with identifying and eliminating toxins. This powerful defense force—created by God as a blessing for human beings, and the like of which exists nowhere else on Earth—constantly patrols the blood vessels.

White blood cells are also known as *leukocytes*. Under normal conditions there are between 6,000 and 10,000 leukocytes in 1 cubic millimeter of blood. There is an average of 500 erythrocytes for every leukocyte in the bloodstream. If all the leukocytes in the bloodstream were to be gathered together, they would just about fill a coffee cup.[37] When an infection begins, however, the number of leukocytes in that cubic millimeter of blood may rise to 30,000.[38]


Do you not know that God is
He to Whom the kingdom of
the heavens and the Earth
belongs and that, besides
God, you have no protector
and no helper?
(Surat al-Baqara: 107)

These cells are soldier cells, identifying and waging war on all kinds of foreign bodies that enter the body. Some fight germs directly, while others stimulate the immune system by recognizing foreign molecules and microbes.

White blood cells are produced in the bone marrow at a production rate of 1.2 million a second. That amount adds up to fully half a ton of white blood cells during a person's lifetime.[39] The bone marrow serves just like a shelter or warehouse for the white blood cells.

There is also a quantity of leukocytes standing ready in the blood. For them the circulatory system is a matchless means of transport through which they can reach every corner of the body. Microbes entering through the bloodstream are destroyed all along its course, and those that enter the tissues are eliminated wherever the white blood cells can reach.

It takes around 10 seconds for a white blood cell to leave the heart, reach the head and return; and roughly one minute to reach the big toe, the furthest point in the body, and return to the heart. A single leukocyte will travel through the body more than 1,000 times a day.[40] Despite having a nucleus, a leukocyte—which is a colorless and not strictly "white" cell—loses its ability to divide after entering the bloodstream. Its objective now is not to divide and reproduce, but to wage war.

After entering the bloodstream, the leukocytes' lifespan is from 3 to 4 hours in the blood, and 3 to 4 days in tissues.[41] These warriors, created by God to protect the body, eliminate the relevant danger in that space of time.

In cases of severe infection, the leukocytes' lifespan falls to just an hour or two. That is because these cells head towards those regions of the body that are under


If there had been any gods besides God in heaven or Earth, they would both be ruined. Glory be to God, Lord of the Throne, beyond what they describe!
(Surat al-Anbiya': 22)
Adnan Oktar

attack, discharge their defensive duties there, and shortly afterwards die of exhaustion or of poisoning by the invader once their mission has been accomplished. At the same time, however, production continues in the bone marrow in order to keep fighting and eliminate the infection.

Even if there is no infection in the body, the leukocytes are not redundant. Even if not defending the body from enemies, they still have important tasks to perform. They go on patrol, visiting every one of the 100 trillion cells in the body several times a day—during which patrols they identify and eliminate sick or aged cells. Even aged white blood cells that are unable to do their jobs are eliminated by still other leukocytes.

In general terms, white blood cells are classified under five groups, depending on their size and whether or not they possess a nucleus. These include lymphocytes (T and B), monocytes, neutrophils, eosinophils, and basophils. The division of labor among these defensive cells is precise and literally flawless.

Basophils: The Body's Secret Defenders

A great many people are unaware of the risks posed by blood clotting, a requirement of the perfection of the whole system. Yet as you shall shortly see in some detail, the clotting process is not only a matchless and life-saving system, but also one that can represent a grave danger in the event that it fails to function properly—for example, if clotting takes place inside the body.

Blood begins to clot the moment it comes to the skin surface and makes contact with the air—a perfect

THE WHITE BLOOD CELLS THAT PROTECT 100 TRILLION CELLS

Blood cell type	Lifespan in blood	Function
Neutrophil 	7 hours	Immune defenses
Eosinophil 	8 to 12 days	Defense against parasites
Basophil 	a few hours to a few days	Inflammatory response
Monocyte 	3 days	Immune surveillance
B-lymphocyte 	memory cells may live for years	Antibody production
T-lymphocyte 	memory cells may live for years	Cellular immune response

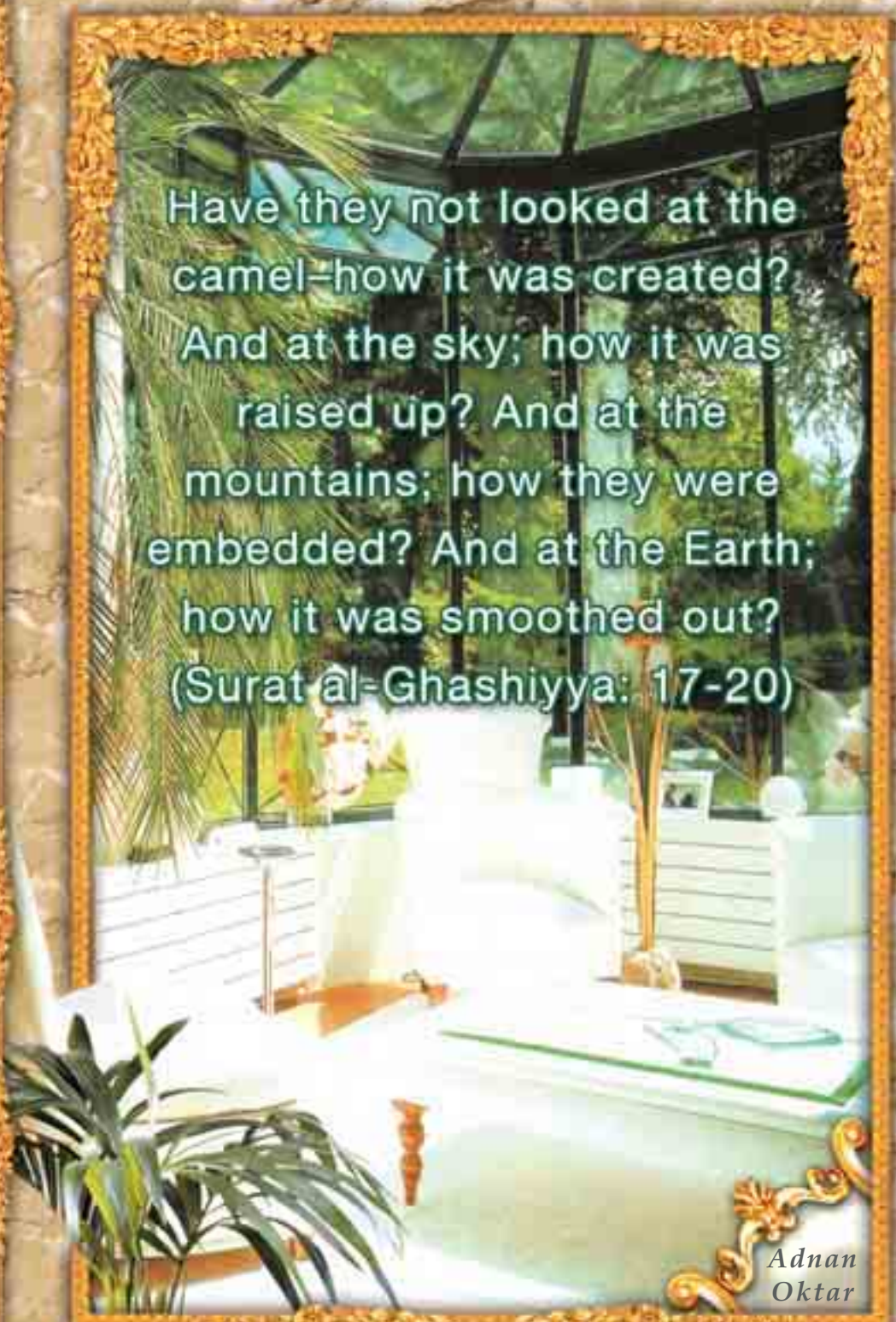
The cells collectively referred to as white blood cells actually consist of various types of cells with different responsibilities. Under the division of labor shown in the chart above, every defense cell knows what function it must perform, and where. Thanks to this system, created as a blessing by God, the defense of the entire body takes place both quickly and effectively.

system that saves our lives. However, if blood should clot inside the veins in the same way as it does on the surface, that may soon result in death. Even the smallest blood clot is large enough to block one of the veins leading to the heart—a danger that is eliminated by the basophils.

Basophils deposit in the blood a compound called *heparin*—a special substance that prevents blood clotting inside the veins. This precautionary measure eliminates any potential threat before it ever arises. This is an important condition that we encounter constantly in examining the human body: Precautions are taken before a threat ever raises its head.

Heparin not only protects the blood from clotting, but also protects the veins against other substances that might block it. Fat particles in the blood is one example of this. Heparin is especially active after one has eaten a fatty meal, and this cleansing process is of great importance to healthy life.[42]

Heparin is another example of God's creation that appears in every detail in the human body. If all your other organs, tissues and molecules were in place and only heparin were missing, your life could not continue. The way that most people are able to live perfectly comfortably, unaware of this complex system, arises from its complete perfection. It is impossible for such any complex, interconnected system, based on the most sensitive balances, to be a product of blind chance, as Darwinism maintains. The more one examines life, the more it emerges that evolution is a process that cannot possibly have taken place, and the proofs of creation are revealed ever more clearly.


Have they not looked at the camel–how it was created? And at the sky; how it was raised up? And at the mountains; how they were embedded? And at the Earth; how it was smoothed out? (Surat al-Ghashiyya: 17-20)
Adnan Oktar

Eosinophils: Parasite Hunters

This form of white blood cells' abilities of catching enemies are not as developed as those of the macrophages, the body's giant defenders. Nonetheless, eosinophils are experts in one field: They immediately eliminate parasites that enter the body.

Parasites are too large to be caught by the body's other defensive cells. Thus while the body's immune cells are capable of waging a highly effective war against all forms of microbes, they are less effective against parasites. Yet this represents no problem for human beings, since the presence of eosinophils is sufficient to eliminate parasites. Even though most parasites are larger than the eosinophils themselves, the latter still manage to trap and kill them.[43]

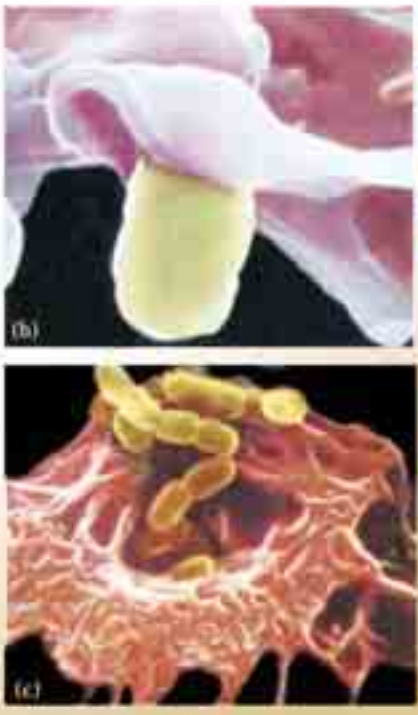
Following their production in the bone marrow, the eosinophils head straight for the tissues. When parasites enter the body, lymphocytes and neutrophils immediately release enzymes to prompt the eosinophils into action. The eosinophils attach to the parasites and release substances that kill the foreign cells. Although these defense cells protect us from very important threats at every moment, little is yet known about the eosinophils' structure and functions.[44] Their magnificent structure, which Darwinists seek to ascribe to chance, has not yet been fully unraveled. Every detail that emerges reveals that God has created these cells with flawless artistry.

Monocytes and Neutrophils at Work

All the white blood cells discussed so far are charged with defending the human body. The

names they are given stem from the functions they perform. In addition, it's also important to understand the division of labor between them. Therefore, it will be useful first of all to examine the process known as *phagocytosis* that neutrophils carry out. This process is a method applied also by macrophages, the mature form of monocytes.

Phagocytosis is sufficient evidence to show how a cell employs intelligence. A cunning attacker that invades the



(a)The macrophage extends a protrusion, or pseudopod, toward the multiplying bacterium. (b) In this way, the bacterium is trapped by the macrophage. (c) The macrophage sucks the bacteria in along with its own cell membrane, and destroys them with powerful lysosomal enzymes. However, that is by no means the end of the defense process. In order to clean up the waste products left over from the bacterium's remains, the macrophage takes its identifying proteins and attaches them to itself like a pennant. This pennant allows another defense cell—the lymphocyte—to acquire information about similar bacteria that may have entered the body.

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body is first "handcuffed" by means of this technique, and then neutralized and eliminated. The method is particularly systematic, and sufficiently effective to be able to eliminate all kinds of foreign bodies.

The cells that carry out the process of phagocytosis are generally referred to as *phagocytes*. As we have already seen, their most important feature is that they behave just like rational entities, monitor their surroundings and immediately eliminate hostile cells, allowing them no opportunity to flee or survive. These cells break down and digest the hostile cell by absorbing it with the help of their *pseudopods*, or "false feet."

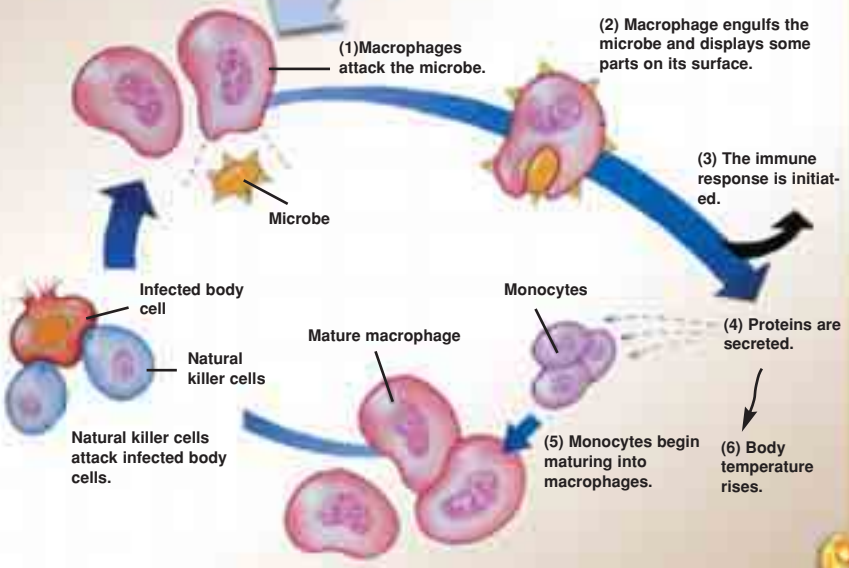
But how do these cells identify a foreign substance that has invaded the body? This is particularly important because all the microscopic cells in the body bear a close resemblance to one another. So how do phagocytes make the distinction?

The body's natural structures possess smooth, phagocytosis-resistant surfaces. There is particular wisdom and significance in how God has endowed the body's natural cells with naturally smooth, phagocytosis-resistant surfaces. Smoothness sends the message that the cell in question is *friendly*, while phagocytes generally identify aggressor cells from their surfaces. However, if a roughness should appear on the surface of this friendly cell for any reason, then there is no way of halting the phagocytes. The body's own tissue will be destroyed by its own defense force.

In addition to their smooth coating, a great many of the body's natural structures also possess a protective protein coat that repels phagocytes. That coat has a special and really miraculous defense system, while there is no such protective coat around the foreign particles and dead tissues that represent the phagocytes' prey.

In addition to all this, the immune system has a special function that assists the phagocytes, by developing antibodies against most foreign bodies such as bacteria. These antibodies adhere to the bacterial membranes and make them susceptible to phagocytosis. Amazingly, the antibody does this by binding

Macrophages attack enemy cells they recognize by their surfaces and display parts of enemies on themselves. This signal announces the presence of an enemy in the body and initiates the immune response.



(1) The macrophages attack the microbe. A local inflammation is initiated. (2) The macrophages display parts of the microbe on their surfaces. (3) This activates the specific immune response, and (4) causes proteins to be secreted. (5) Some proteins stimulate the maturation of monocytes. (6) And some others cause fever.

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to the bacteria on the one hand and to the phagocytes on the other.[45]

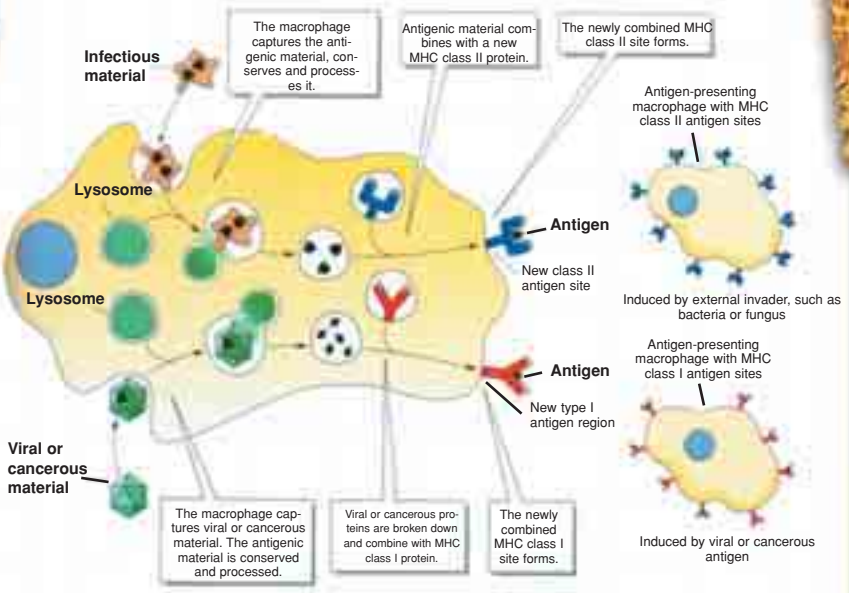
Everyone should stop and consider the way that a cell knows its duty and sets out to hunt down foreign particles in the body, possessing the equipment with which to do this. Phagocytes do not suddenly decide one day to start transporting oxygen or to develop into a muscle cell. As components of the defense system, they flawlessly perform the task they are charged with on a daily, even hourly basis. Their job is both very difficult and very dangerous, yet they never make a mistake when it comes to recognizing and identifying a bacterium. They seem to see, though they have no eyes, and reason and think though they have no brains. That being the case, there is clearly no relationship between their actions and any physical feature. They are under the command of God, Who has equipped every living thing on Earth with flawless features, and Who observes them at every moment.

In one verse God reveals:

It is God Who created the seven heavens and of the earth the same number, the Command descending down through all of them, so that you might know that God has power over all things and that God encompasses all things in His knowledge. (Surat at-Talaq: 12)

The Enemy Is Seized by Pincers

Since the neutrophils entering the tissues are mature cells, they can immediately initiate phagocytosis. As the neutrophil approaches the foreign cell, first it touches it, and extends pseudopods—false arms around it in various directions. Opposing arms embrace the



Antigen-Presenting Macrophages

By a most systematic method, macrophages trap and destroy a cell that has invaded the body. The macrophage captures the antigenic material and processes it to supplement one of its MHC class I or II sites. Being fixed to the MHC protein, the antigen forms a surface complex that will stimulate the T cells' surface receptors. The MHC protein within the complex determines whether it will attach to a killer T-cell or a helper T-cell.

cell, join around it and fuse together. The foreign cell is now engulfed inside the neutrophil, loses its membrane and collapses into the neutrophil's cytoplasm. A neutrophil can phagocytose and destroy 5 to 20 bacteria before it dies.

However, monocytes—the initial form of macrophages—need to mature before they can perform their tasks. Monocytes travel through the bloodstream for 10 to 20 hours before entering the tissues, whereupon they widen by swelling and become macrophages. They can live for months or even years as long as they are

not broken down during the process of phagocytosis. Tissue macrophages represent a flawless system that constantly protects against infection in the tissues. Their phagocytosis methods are different from those of the neutrophils. In general, they possess the ability to phagocytose 100 bacteria. Neutrophils are unable to phagocytose cells larger than bacteria, while macrophages have the ability to eliminate much larger structures.

Neutrophils generally digest the cells they phagocytose inside themselves. As a result of this digestion, the bacterium gives off toxic substances, and after phagocytosing 25 bacteria at most, these toxins increase to such a level as to lead to the neutrophils' own deaths. In one sense, the neutrophil sacrifices itself that the body as a whole might live. Subsequently, the dead neutrophil is itself phagocytosed and digested by the macrophages.

Macrophages, on the other hand, possess the ability to expel waste products after digesting their enemies and therefore, face no danger of being poisoned. As a result, they are still able to perform their functions for months, even for years.[46]

This whole account is a proof of God's omniscience, which we watch with amazement in every system we encounter. It's astonishing how minute living cells are able to identify an enemy and take the relevant precautions. Moreover, these tiny living entities also take measures to be ready in the event that these same enemies enter the body again at some later date. For that purpose, in ingesting the enemy cell, the macrophage separates off a part of it known as the *antigen*, which contains the enemy's identifying

details. It then carries this antigen by displaying it on its own surface like a pennant, which serves as the guide for the lymphocytes, the immune system's real heroes. Thanks to this preliminary education provided by the macrophages, the lymphocytes can recognize the body's main foes. Should these same pathogens enter the body again, they are immediately destroyed by the lymphocytes.

Anyone who evaluates these facts in a rational and unbiased manner will understand how baseless is the myth that the origin of life can be a chance-based process of evolution. Of course, some continue to persist in defending the theory of evolution, despite being well aware of all these facts. Yet these people behave most dogmatically on this subject, and refuse to admit the facts of creation solely in order to reject the evident existence of God. Their rejecting all the many different

The elements of the immune system do not just kill enemies, but also take precautionary measures in the event that specific enemy ever enters the body again. While all this is going on, most people live totally unaware of this perfect system created by God.

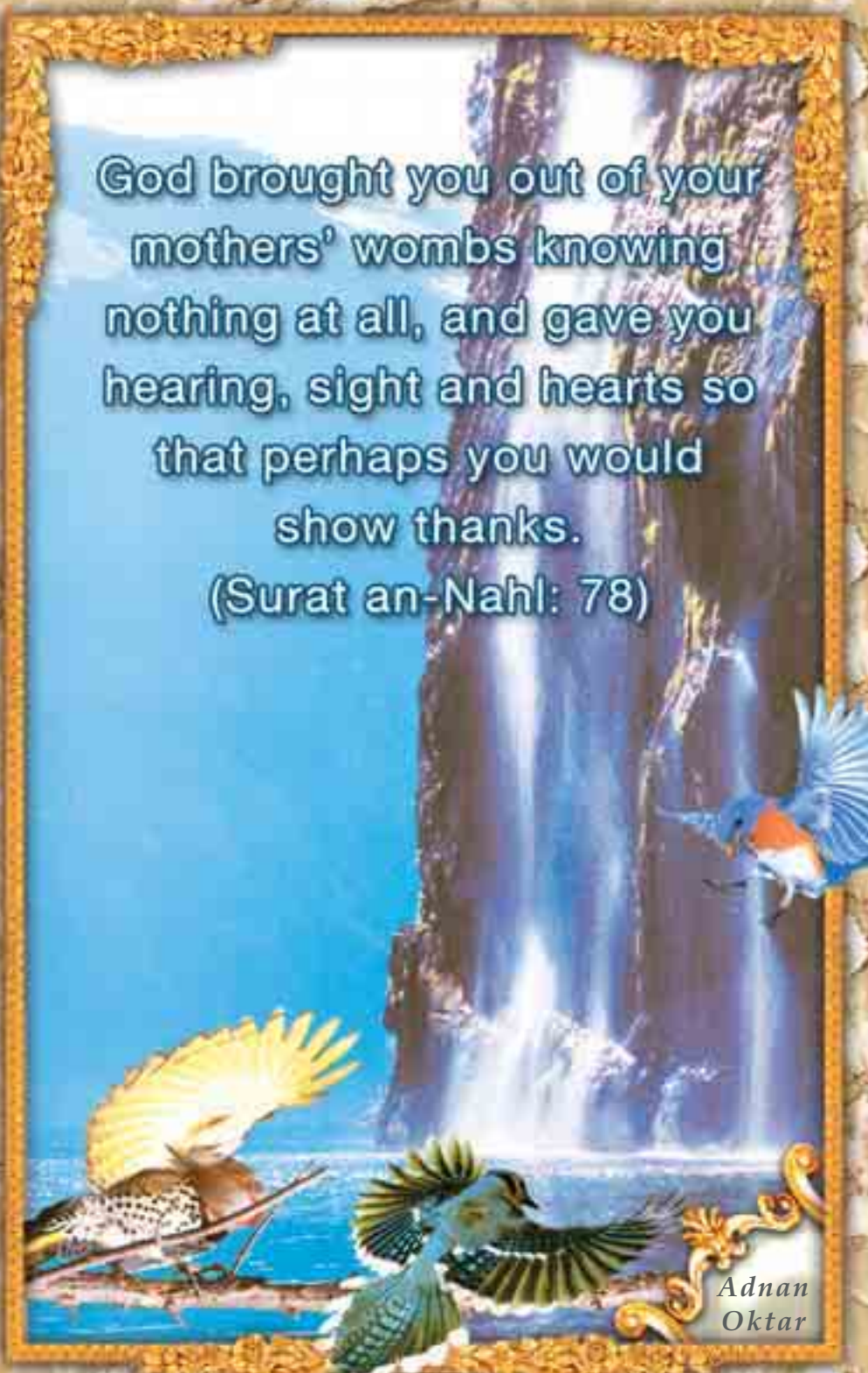
and irrefutable pieces of evidence indicates that their denial has psychological roots.

Submitting to God, our Almighty Lord, and praising Him by appreciating His creations, is very difficult for such people who have glorified—in effect, deified—their own beings. What they should do, however, is simply recognize the absolute dominion of God and appreciate and give thanks to Him accordingly. The number of people who appreciate the works of God on Earth, who constantly discover new magnificent features and who have faith in God, is rising every day. A great many scientists have begun to recognize these truths and to free themselves from the myth of evolution.

Lymphocytes: The Army's Commanders in Chief

The defense provided by the macrophages is of the greatest importance to the body. Invaders are digested, primarily thanks to the activities of these intelligent cells. But since the macrophages are engaged in such intense activity, then why is there any need for lymphocytes, another group of killer cells? Why is there a need for a second line of defense?

The explanation is that invaders may have different properties. Our bodies have taken very different precautions against enemies that we might encounter at any moment. There may sometimes come the need for a wide-ranging army, because some enemies may be so powerful as to entirely take over the body they occupy. At such times of peril, the lymphocytes go into action and wage a fierce battle against the invaders.


God brought you out of your mothers' wombs knowing nothing at all, and gave you hearing, sight and hearts so that perhaps you would show thanks.
(Surat an-Nahl: 78)
Adnan Oktar

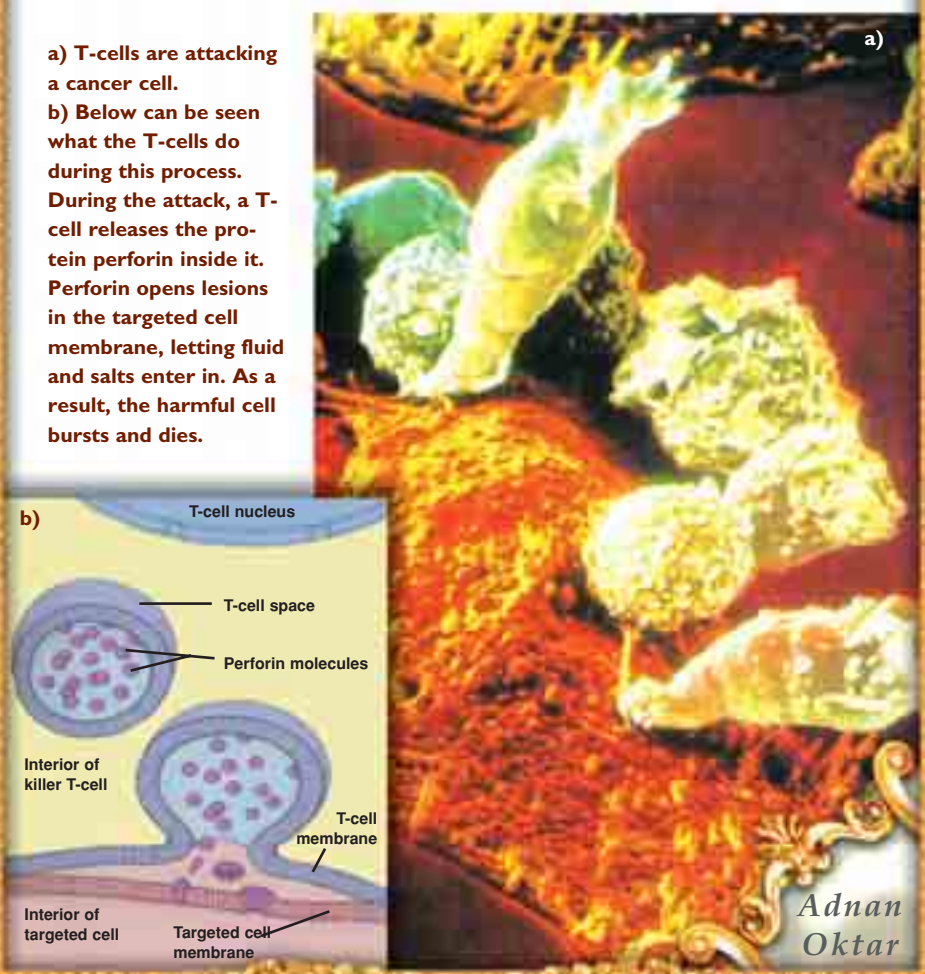
To stop their foe's advance, lymphocytes possess poisonous chemical weapons. The way that cells just a few microns in size can initiate production of toxic substances and use it in the appropriate locations and circumstances is of course a magnificent sign of creation. Toxin production is a very complex process for even a rational human with technological means at his disposal. Yet here, the "poisoner" is just a cell traveling through the bloodstream, and it very definitely possesses no chemical knowledge. Moreover, it is not sufficient for the lymphocyte merely to manufacture that toxin. It needs to determine where it needs to be preserved and employed. Otherwise, it will be damaged by the very toxins it carries, and the body will be overcome by the attack of its very own troops.

Lymphocytes are so seemingly careful and rational that as their properties are described, you might get the impression that one is referring to a conscious entity. Yet actually such a comparison would be inadequate for the task, because even a conscious, careful human can make mistakes. That is not true of lymphocytes, however. These intelligent cells must carry the toxic substance they produce in such a way that it will harm neither them nor us.

As if they were aware of the danger this substance represents, lymphocytes carry it in small sacs in their cell membranes. They must know into which cells they will inject this toxin they carry with such care. Were they to lack that knowledge, this would constitute a grave threat, because these expert warriors are powerful enough to destroy every cell in the body. Any inability to distinguish between friend and foe could lead to the death of the human being.

People engaged in the field of medicine witness with complete amazement how lymphocytes recognize hostile cells, approach them and inject the poison they carry into them. How is it that a microorganism with no sensory organs can distinguish between other microorganisms that appear very little different to others? The superior abilities employed by lymphocytes during this process are truly astonishing.

Human beings recognize one another by their external appearances and voices. Lymphocytes, on the other hand, rec-

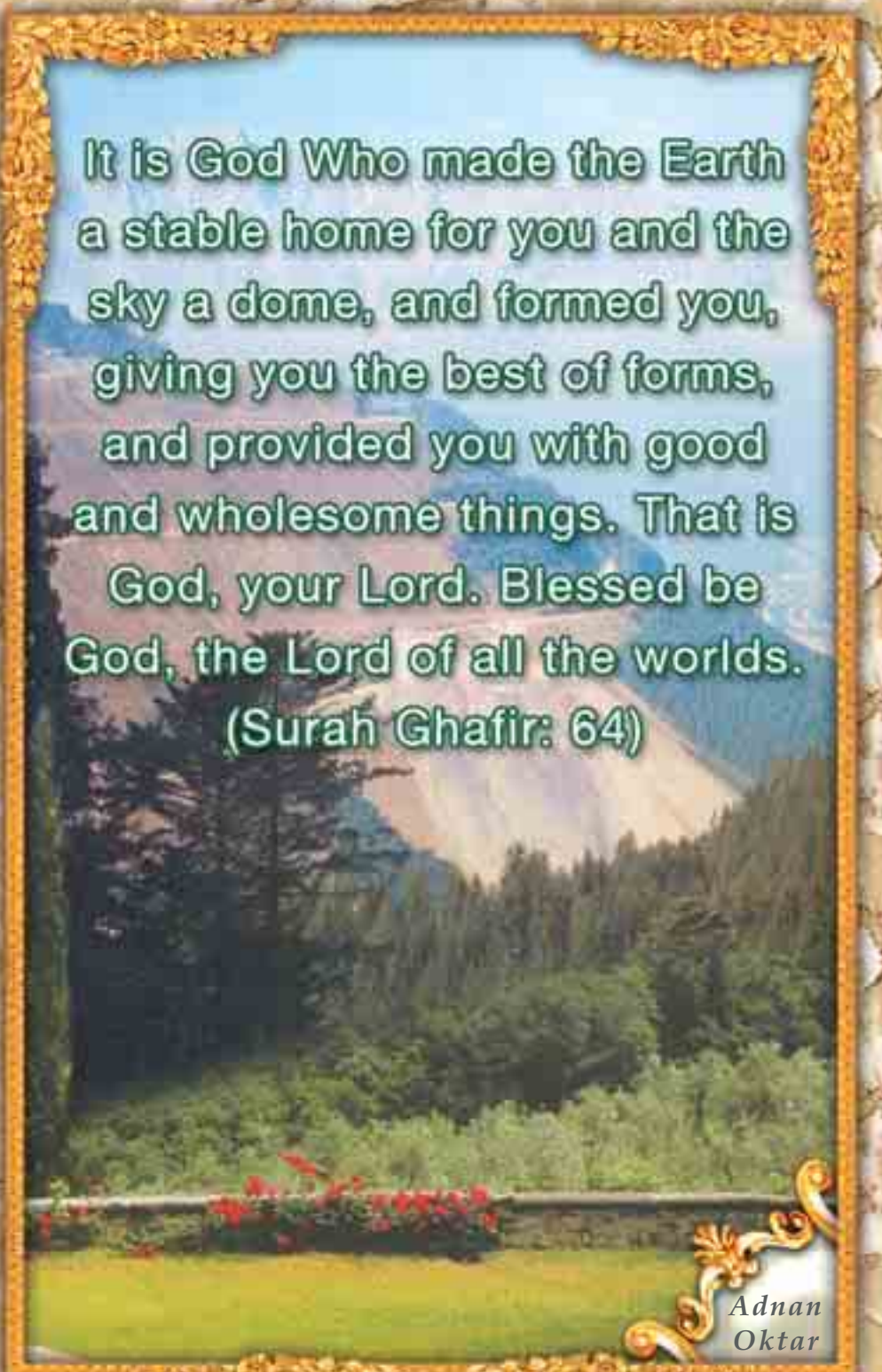


a) T-cells are attacking a cancer cell.
b) Below can be seen what the T-cells do during this process. During the attack, a T-cell releases the protein perforin inside it. Perforin opens lesions in the targeted cell membrane, letting fluid and salts enter in. As a result, the harmful cell bursts and dies.

ognize enemies from the proteins they bear. Every bacterial and viral protein is different from human proteins. Immune cells can immediately detect that difference.[47] In much the same way that you can tell if a stranger has entered in your home, so lymphocytes immediately recognize these unexpected guests because of their differing proteins.

Darwinists need to account for this miraculous state of affairs in terms of their own theory. The lymphocyte is a cell with no opportunity of learning through trial and error. In order for the proponents of evolution to be able to account for this, they need to explain how the defense cell in question knows how to distinguish between the body's cells and hostile ones, how it decides to kill the latter, how it produces poison to that end, and how it developed sacs to carry that poison so that it and the body as a whole should come to no harm. In addition, it also has to stay alive while doing all these things. According to the theory of evolution, all these stages must have come about by chance, because there is no consciousness

A T lymphocyte infected by the HIV virus. Despite their power, T lymphocytes are helpless before the speed at which the HIV virus constantly changes, making itself unrecognizable to the body's immune system. It attacks the immune cells and thus neutralizes this system in the body.

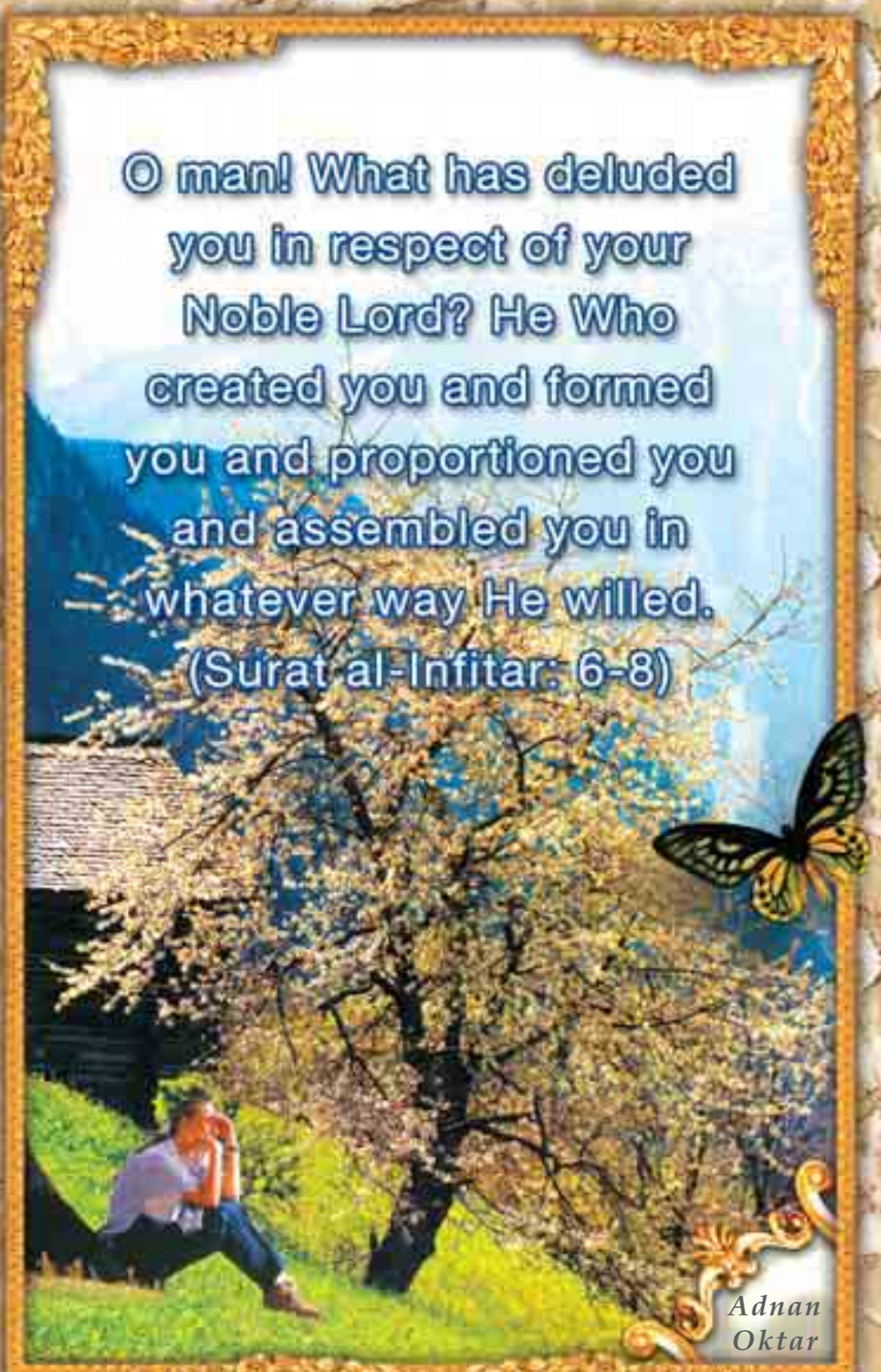

It is God Who made the Earth a stable home for you and the sky a dome, and formed you, giving you the best of forms, and provided you with good and wholesome things. That is God, your Lord. Blessed be God, the Lord of all the worlds. (Surah Ghafir: 64)
Adnan Oktar

or planning at the basis of evolution. Everything has to develop at random, in an uncontrolled environment.

According to evolutionist claims, the lymphocyte will have acquired its features and abilities gradually, as a result of chance mutations, and only when the body's need for defense arose. It is of course unclear how the human body might be protected during the course of imaginary random phases lasting hundreds, even thousands of years. Under these conditions, a body that had not developed a fully functioning immune system would die within a few days due to a bacterial or viral invasion. Yet whatever the suggested coincidences that might have given rise to this perfect and rational system, it developed in such an appropriate and planned manner that it underwent not a single error.

To subscribe to the above fairy tale is of course impossible. Yet this, surprisingly, is the evolutionists' fundamental claim. It is impossible for unconscious coincidences to give rise to perfect organisms, systems and complex structures without making a single mistake, because coincidences lead to errors in the system that already exists. Any random intervention in any mechanism of a particular level of complexity will inevitably harm it. Clearly, such an extraordinarily complex system as the immune system cannot have formed and developed by chance. Adorning this myth, devoid of any scientific validity, with scientific terminology is definitely not enough to redeem it.

In the face of this account, readers have to arrive at a decision. Either they will believe that unconscious coincidences managed all this and arranged a miracle, or else they will regard this claim as nothing more than


O man! What has deluded you in respect of your Noble Lord? He Who created you and formed you and proportioned you and assembled you in whatever way He willed. (Surat al-Infitar: 6-8)
Adnan Oktar

a baseless, illogical fairy tale. Since we are referring to an immune cell with all these flawless properties, then we must clearly see that not even one unconscious, unplanned stage can enter the equation. The lymphocyte can survive and function only with all the organelles that keep it alive, the sacs capable of carrying toxic substance, and its ability to identify enemies and do battle...

It is impossible to do away with just one of these features and claim that it developed in stages over a long period of time. This cell, just like everything else, took its place in the human body, together with all its properties, at the moment chosen by God. It performs its function in the body perfectly because God so wishes. It is under our Lord's control at every moment, in everything it does.

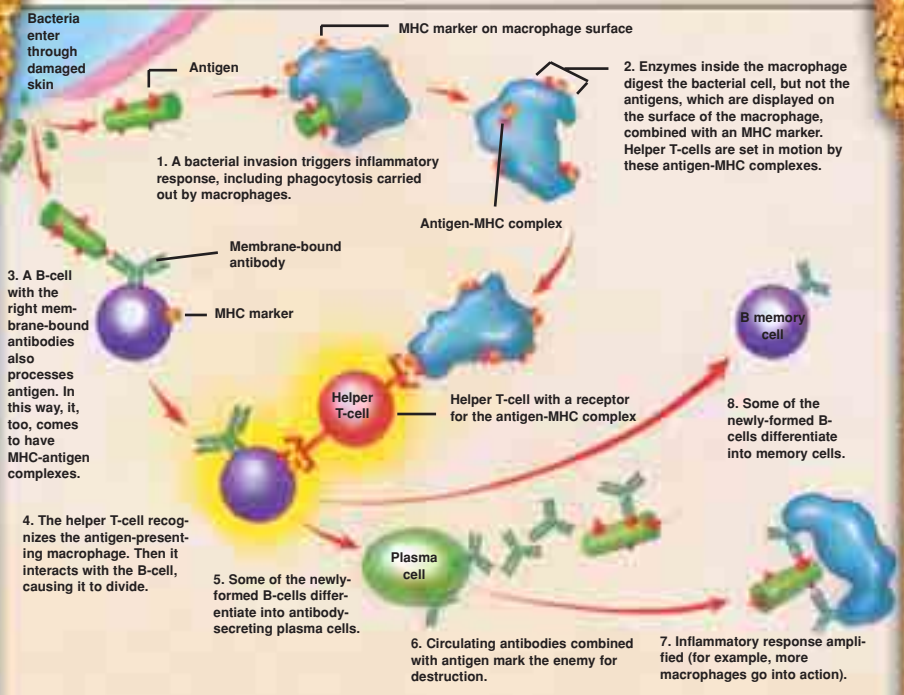
In one verse God reveals this truth thus:

God, there is no god but Him, the Living, the Self-Sustaining. He is not subject to drowsiness or sleep. Everything in the heavens and the earth belongs to Him. Who can intercede with Him except by His permission? He knows what is before them and what is behind them but they cannot grasp any of His knowledge save what He wills. His Footstool encompasses the heavens and the earth and their preservation does not tire Him. He is the Most High, the Magnificent. (Surat al-Baqara: 255)

Division of Labor: B and T Lymphocytes

B lymphocytes, the body's weapons factory, are formed in the bone marrow, travel to the lymph glands by way of the blood and continue living there. At moments of danger, the B-cells provide logistical support. The

B and T lymphocytes protect our cells



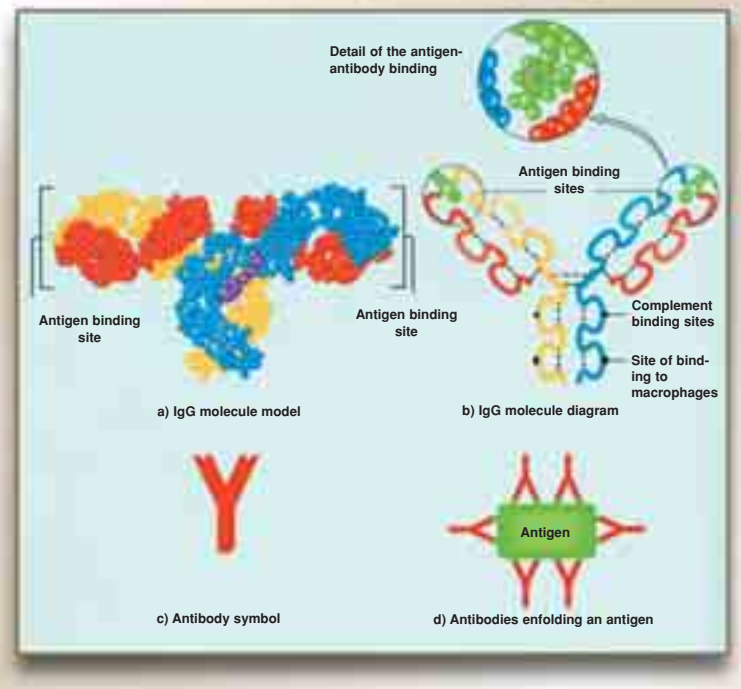
This diagram shows the amplification of the inflammatory response—in this example, an antibody-mediated response to a bacterial attack. Plasma cells release antibodies, which travel through the blood and mark the attackers. These marked invaders set other defense elements such as macrophages into action, enabling them to participate in the defense.

weapons they produce to kill the enemy are Y-shaped antibodies. They attach these to their cell casing until it consists of thousands of these antibodies. It is impossible for a foreign body entering the system to escape these receptor antibodies.

After assuming this mature form, B lymphocytes range through the body for years, just like a patrol-

Adnan Oktar

The harmony between the antibody and antigen

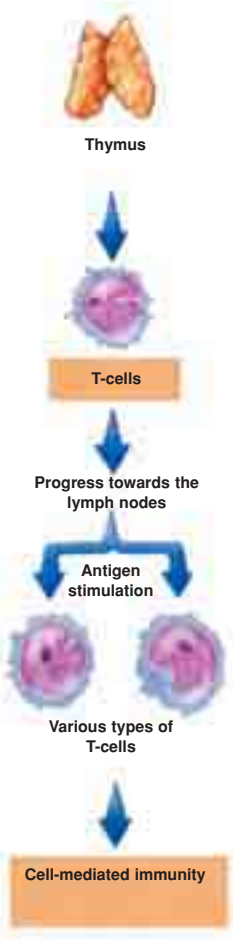


After the T-cells introduce antigens they're carrying to the B lymphocytes, the B-cells divide and begin producing the appropriate antibodies. The antibody's compatibility with the antigen is a flawless example of creation.

man. When a stranger enters the body, a state of alarm is initiated. The B lymphocytes immediately perceive this alarm and swiftly head to the enemy's position, absorb all the proteins of the enemy they catch—a virus, for example—and break it down. They then attach fragments of the virus onto the surface of their own cells. Once matters have come to an end, the components of the virus remain on the B lymphocytes. These components are the *antigens* that identify the enemy to whom they belong.

Harun Yahya

After this stage, the B-cells require support. Helper T-cells, created for this purpose, immediately become aware of this need. The T-cells recognize the B-cells carrying the antigen components and approach and knock against them. During this maneuver, the B lymphocytes release a substance that contains a string of directives to the T-cells, in which it is specified that the antigen in question belongs to an *enemy*, and that its identity needs to be shown to other T and B-cells—in other words, to other police units.[48] The helper T-cells move away as soon as they receive this directive.



At this point, it will be an advantage to gain a deeper knowledge of the T-cells, which form in the thymus gland immediately above the heart. Once they have matured, they learn to recognize various antigens. This education is most important for the rest of our lives, since an immune cell that does not recognize an antigen cannot protect the body. The T-cells that form in the thymus gland undergo such a comprehensive "education" that they

T-cells, a fundamental element of the immune system, are produced in the thymus gland. Then a series of training measures begins, because the T-cells must recognize the antigens they encounter. As a result of this miraculous training, the cells are able to recognize even artificial antigens produced in the laboratory.

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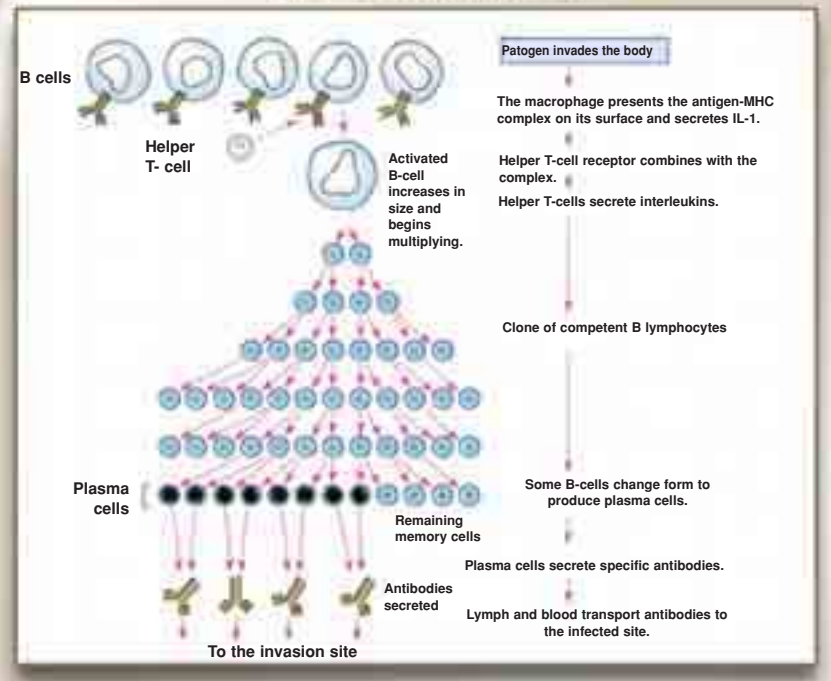
can easily recognize hundreds of millions of naturally occurring antigens. What makes their learning so miraculous and extraordinary is the presence in our bodies of T-cells that can even recognize artificial antigens created in laboratories.

Evolutionists can never have any explanation for how a cell too small to be seen with the naked eye is aware of threats in the body coming from the outside and has developed means of dealing with them. The sole explanation for this magnificent fact is that the outside world and the body itself all have a *single* Creator. No doubt but that this Creator is God, the Creator of all.

The helper T-cells that receive this directive at moments of danger spread through the body in the light of the information they've received. By now, every B-cell in the body is aware of the enemy's presence and know all of that enemy's characteristics. In the face of this danger, the B lymphocytes, stimulated by the helper T-cells, begin to multiply, dividing literally thousands of times. Unlike the original B-cells, however, the newly produced B-cells lack the ability to perceive and destroy. Their duty is to spread through the body and seek antigens, to which they bind whenever they find them. In this way they set into operation another immune cell, the natural killers. They leave the work of destruction to these cells, which are still more powerful.

It takes around five days for the B lymphocytes to produce antibody factories and begin producing antibodies. During that time, the body's defense is turned over to immune system cells that are present from birth. During this period, a person will feel rather weak, and with generally a rise in body temperature. After five days, once the B-cells assume their duties, an immediate improvement is observed as the enemy cells are rapidly killed off.

B lymphocytes multiply and disseminate the news of the invasion...



When a B-cell attaches to an antigen and helper T-cells start secreting interleukin, the B-cell becomes activated. It starts multiplying and differentiate, some turning into plasma cells that secrete antibodies. The plasma cells remain in the lymph tissues, but the antibodies go to the infected sites by way of the bloodstream and lymph system. Antigen-antibody complexes form and stimulate the complement system. Some B-cells differentiate into memory cells and continue to produce antibodies, even years after the infection.

The reason why we humans catch certain illnesses such as measles only once is that the B lymphocytes now recognize the virus at once, as soon as it enters the body, and these cells immediately digest and eliminate it. The virus has no opportunity to cause a recurrence of the disease. The reason why children are inoculated—that is, injected with killed or weakened causative agents of the disease—is to introduce the pathogen to the B-cells.[49]

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Close Pursuit

Inside the body there is a system that in terms of complexity, is little different from the social life among human beings. The only difference is that the starring role in the internal system is played by cells.

Nonetheless, we can see extraordinary resemblances in terms of the methods employed, the tactics implemented, and the precautions taken. Like conscious human beings, the cells possess similar abilities to defend themselves, behave intelligently and take precautions. One of the most important examples of this takes place, again, among the defense cells.

Some germs know how to protect themselves against the lymphocytes ready to attack them inside the body. They install themselves on or inside a cell in the body and effectively disappear. The bacterium that causes tuberculosis, for example, is particularly cunning, installing itself inside the macrophage that comes to destroy it.

There are manifestations of an infinite intelligence in all the systems created by God. The way that a single-celled microorganism is aware of the dangers awaiting it in the human immune system and applies a method requiring a conscious strategy are just two of these manifestations. What causes this bacterium to behave in this way? How it is aware of the coming danger? How has it managed to conceive of entering inside the macrophages? These questions and hundreds of others remain unanswered by the theory of evolution and its supporters, who seek to offer accounts based on random mutations. It is impossible for the proponents of evolution to account for the conscious behavior in the micro-world in terms of chance. This is God's superior creation.

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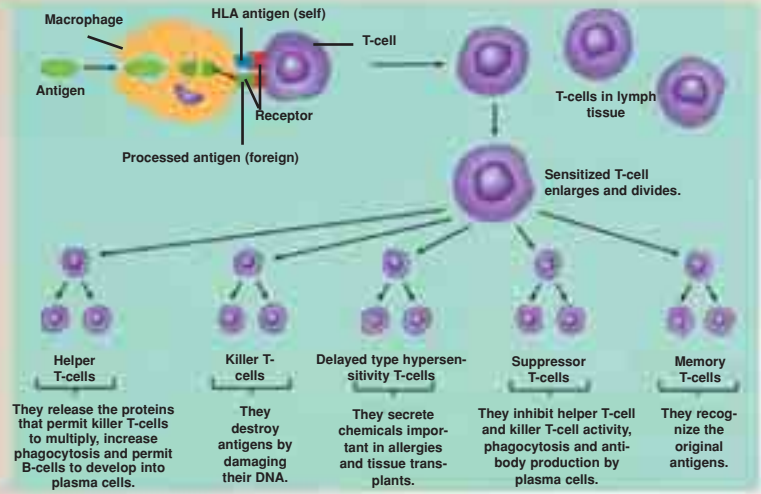
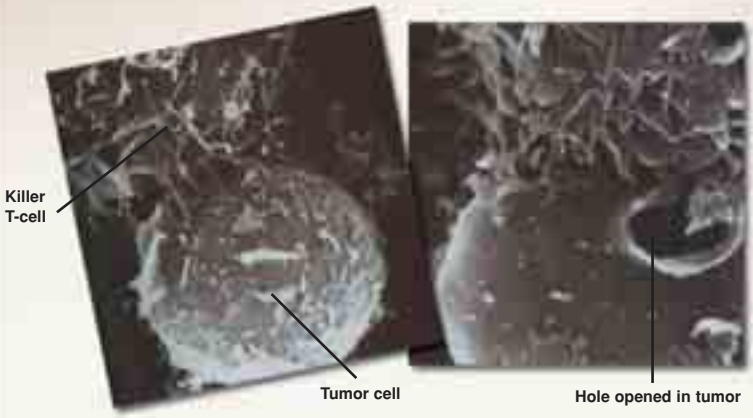
Killer T-Cells Deal A Lethal Blow...



As the above diagram shows, T-cells fulfill their different roles to perfection, providing a flawless defense.



Like human beings, cells also possess abilities such as self-defense and intelligent behavior. They develop tactics and take precautionary measures. Among them there is an astonishing division of labor and regulation, thanks to which they identify enemies, kill them, and pass their "experience" on to subsequent generations. The killer T-cell seen at the above left recognizes and attaches to the tumor. It then secretes proteins that will perforate the tumor membrane. To the right, a tumor perforated by the proteins secreted by the killer T-cell. This hole will soon lead to the eradication of the tumor.

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Many other proofs of the incomparable intelligence are displayed within a single cell. For example, no matter how much foreign agents conceal themselves inside the cell, a defense system in the body identifies that hiding place. After the bacterium has entered the macrophage, a special molecule inside the latter takes a part of the bacterium and carries it to the surface of the cell. The helper T-cells recognize this combination in front of them and release a substance that allows the macrophage to realize that there is a foreign body inside it. After its location is established, the enemy can then easily be destroyed.

Enemies that enter other cells of the body are located by killer T-cells and also destroyed. Special molecules inside the cell report that an enemy has installed itself in the cell. Killer T-cells strike the virus and completely destroy the cell inside which the virus was hiding.[50] This actually represents a kind of self-sacrifice on the part of the cell inside which the virus installed itself. It risks being destroyed by the killer T-cells for the sake of defending the body as a whole.

On close inspection, no single stage in any of these processes is random or left to chance. Indeed, the phenomena observed are indications of a superior consciousness that one would never expect from a minute cell. All this activity described here is actually combat between single-celled organisms just a few microns in size, in areas of just millimeters. Since we cannot expect a cell with no decision-making mechanisms to wield intelligence, and since we cannot ascribe the conscious processes performed to its own abilities, then we clearly need to direct our amazement to the sole possessor of that intelligence—Almighty and Omniscient God, the Creator of all.

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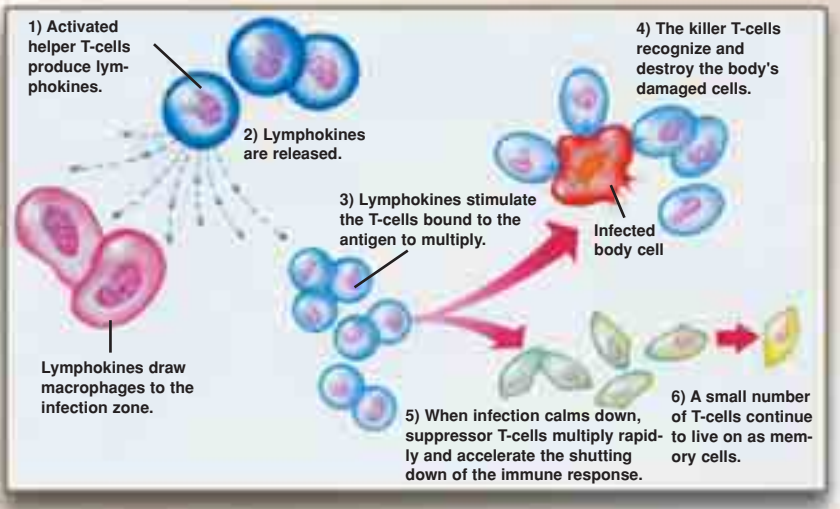
T Cells Carry the War to its Conclusion



The cell-mediated immune response consists of three stages: 1) the activation and attack by the T-cells, 2) proliferation of the suppressor cells that shut down the immune response, and 3) the persistence of the memory cells. After completing the active defense, the time has now come to withdraw. For this, the suppressor T-cells rapidly begin to multiply and accelerate the halting of the response.

The Immune System Returns to Normal

This activity, which has been described in some detail, depicts the situation in the body under exceptional circumstances. Were it to continue in an uncontrolled manner—if the B-cells continued to multiply even after the disease was vanquished, and if the T-cells rushed everywhere setting all the defensive cells in motion—then an unrestrained and pointless war would drag on. This would lead to healthy cells being damaged and the body suffering extreme fatigue and exhaustion.

In order to prevent this, the "news" that the war is over needs to be spread throughout the entire body.

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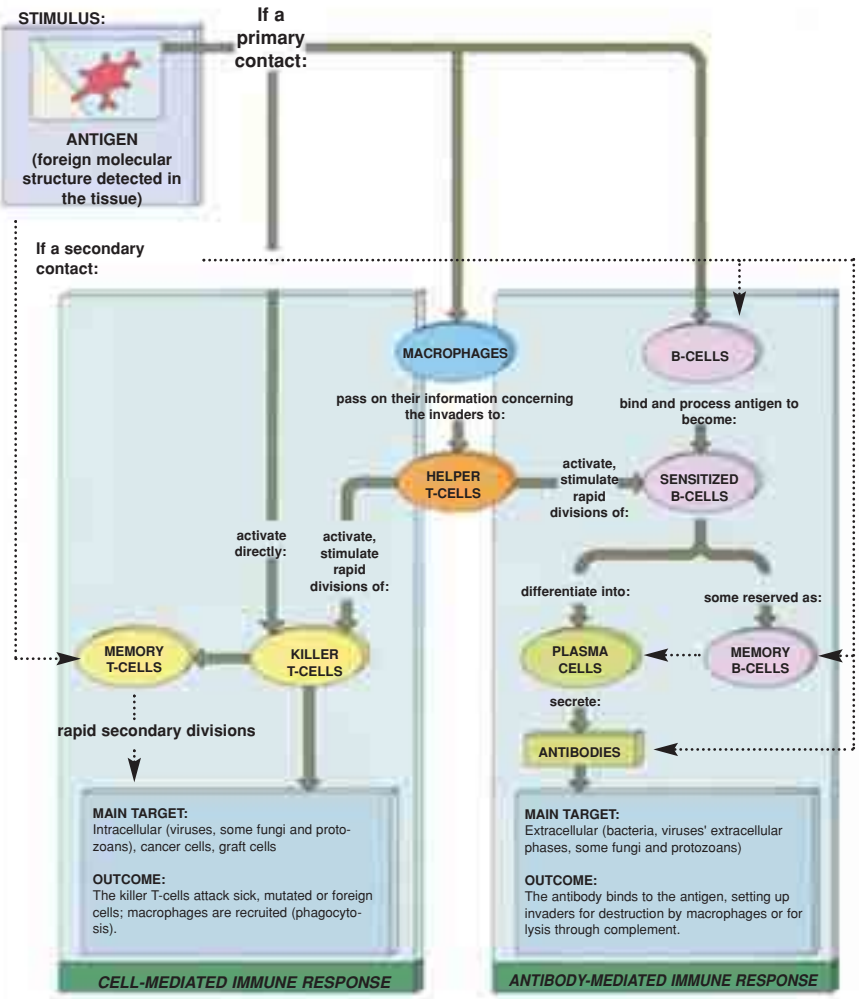
DEFENSE BY MEANS OF CELLS OR ANTIBODIES



The human immune system is extraordinarily complex. Even this diagram omits many details, and many processes are not shown. The working of the system, even in general terms, is exceedingly detailed and rational.

This duty falls to yet another class of blood cells: The *suppressor T-cell* enables the immune system to return to normal by calming down the defense cells. Substances released by the suppressor T-cells slow down the actions of the B-cells and cause the killer T-cells to stop their war. They reduce the numbers of helper T-cells and calm down the body's defenses.

The war is now over, leaving many dead cells, bacterial debris and ruins all around. At this point the phagocytes enter the picture. Phagocytes spread over the battleground and clean up all the debris and dead cells. During this mopping-up operation, they also apply first aid to damaged tissues around them, and renew damaged regions.

The T and B-cells die within a few days of the end of the battle. A small group of survivors continue to live for a long time, however. These cells are *witnesses* to what has taken place inside the body, and their survival is of the greatest importance to the survival of subsequent generations of cells. They identify the recognition signal of the enemy—in other words, the antigen that caused the war to begin. They are therefore no longer referred to as defense cells, but as memory cells. The immunity acquired to a virus that has previously attacked the body comes about thanks to these memory cells. On any subsequent occasion, they will meet a cell of the same type that has entered the body and will ensure that it is eliminated before it is allowed to multiply or do any damage.

The "enemies" referred to here are two different cells that are quite unaware of one another. One lives in the body, and the other is a visitor from the outside. How is it that these different cells can possess such an ability to recognize each other? How, and through what decision, does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a cell carry the information about another cell it regards as hostile? How—and why—does it survive when all its fellows die?

Can you really believe that this flawless defense system, of which you have seen many details, could come into being by means of random events, and uncontrolled and blind coincidences? It is of course impossible to think so in the face of so much evidence. The conscious events taking place here are so flawless and controlled as to exceed the management capacity even of a conscious human. This system, which cannot come into being through the intervention of conscious human beings, let alone random mutations, clearly demonstrates the fact of Creation.

God, Who has created all things merely by commanding them to *Be*, has created these tiny organisms from nothing, endowed them with a perfect compatibility and order, and inspired in them the tasks they need to perform. That is why a defensive cell recognizes its body's enemy, holds it in its memory, and stands guard to prevent harm befalling subsequent generations. Just the existence of these microorganisms, which God has created with a superior wisdom, is enough to lead a person in the direction of faith, and is proof of God's infinite might.

In the Qur'an God reveals:

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)

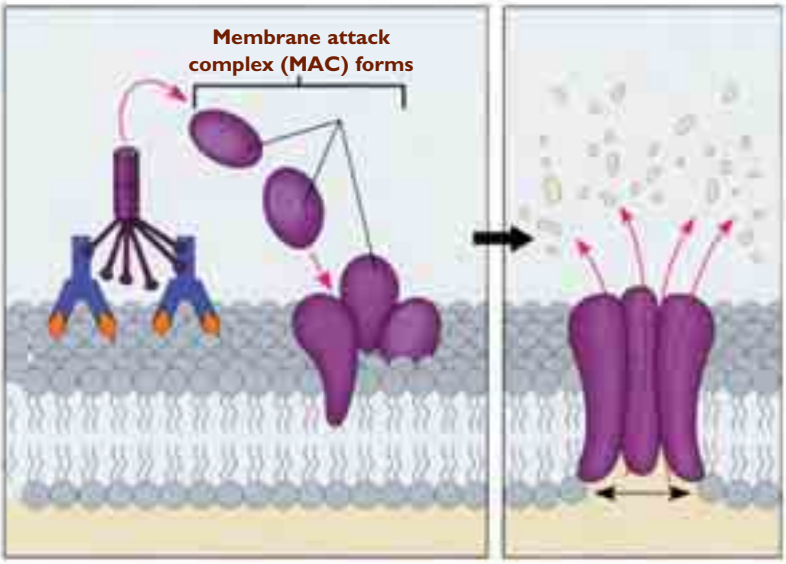
Intelligent Bodyguards in the Blood: Complement Molecules

The white blood cells, or leukocytes, which come in several cell types, have been programmed to war against anything that might do you harm, right from the moment you drew your first breath. The lack of even the smallest component of this impeccable mechanism could lead to you dying from a simple illness.

In addition to this perfect system in your body, there are guards who remain active even if you do not actually fall ill. These bodyguards have been programmed to attack *every cell* in your body, from birth until death. What is astounding is that though they exist in order to protect the body, they regard all the cells that comprise that body as hostile.

The system they comprise is known as the *complement system*. Complement molecules consist of 20 different proteins, produced in the liver, from where they enter the bloodstream. Under normal conditions, these cells that move haphazardly in the veins and arteries have no effect. But when aroused, they suddenly decide to destroy all the cells they detect.

The stimulus they receive is spread throughout the body by means of a single complement cell; and upon receiving this signal, they are unable to distinguish friend from foe in the body. They may therefore attach themselves to the body's own cells and seek to destroy them. Yet they are not actually permitted to do so, because the body cells possess the capacity to defend themselves. They *recognize* the complement cells the moment they encounter them. As soon as complement cells contact a body cell, the body's own cells neutralize them. This way, the body is prevented from



The activated complement attaches to the pathogen's membrane in stages and forms the membrane attack complex (MAC).

MAC, inserted into the cell membrane, initiates the destruction of the cell.

being attacked by its own troops. On the other hand, foreign organisms that enter the body will inevitably and unexpectedly be assaulted by these guards.

When a complement molecule binds to a foreign body, it changes shape. This is followed by the first protein of the complement molecule binding to the invader. Later, the other proteins in the complement molecule attach themselves to the invader one by one, until the complement hunters cover the whole surface of the invading cell. The final element of the complement system is responsible for attacking the cell membrane. This clever molecule opens a hole in the cell membrane of the now defenseless foreign cell,[51] which absorbs extracellular fluids, swells and eventually bursts.

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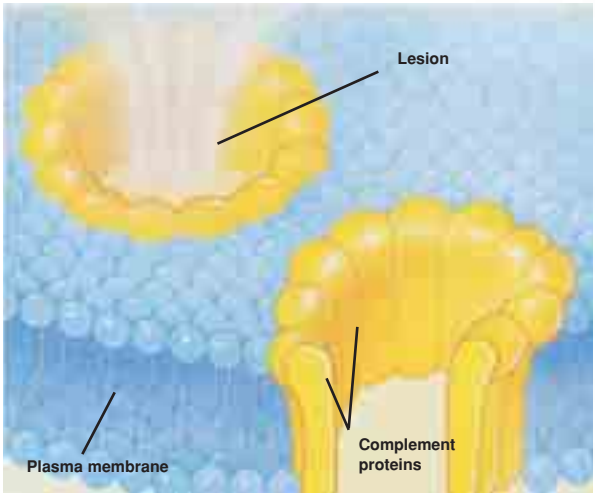

Complement cells cause lesions by perforating the invader cell's membrane. Any further harm from the invader cell is thus prevented.

Following their attack, complement molecules sometimes use another method. They cover the foe with a fine membrane, and thus indicate it to other ingesting cells.

As we have seen in this example, there is an imposing intelligence in every part of the human body. Every organism has this intelligence that protects, defends and keeps it alive. It is essential that a body's cells recognize the complement attackers; otherwise a single assault could result in the death of the individual. These powerful guards have to be standing ready at every moment.

Now consider: How many people are aware of the existence of this flawless complement system in their own bodies? Apart from scientists who are experts on the subject, no doubt the number of people who know of this mechanism is very small. Nevertheless, every human being, without exception, is equipped with this perfect system which operates at all times, non-stop. That is because our Lord God creates it, and He gives the cells the knowledge with which to protect the body.

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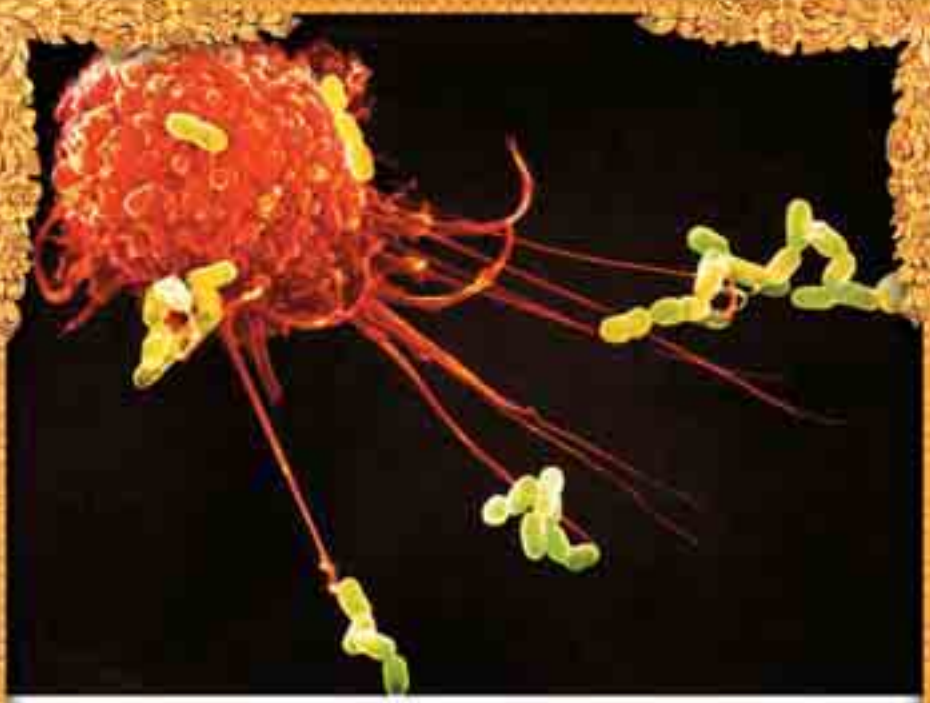

Throughout the human body, a perfect intelligence prevails. Cells charged with defending the body are equipped with perfect systems with which to recognize the enemy.

God inspires in them the knowledge of which cells to fight, and when. God determines their duties, and the flawlessness they possess is a blessing to them from Him. And you are protected against invaders that enter your body because He wills it, and in the manner willed by Him. In its every detail, this perfect system is the work of our Almighty Lord.

The war inside the body may not result in victory every time. The entry of bacteria that are more competent than the complement molecules can totally undermine those molecules' order. When that happens, the mutual display of intelligence in the body is utterly astonishing.

Before they even enter the body, for example, pneumococcal bacteria, which give rise to lung inflammation, recognize the warrior molecules that will attack them. It is our Almighty Lord Who introduces them

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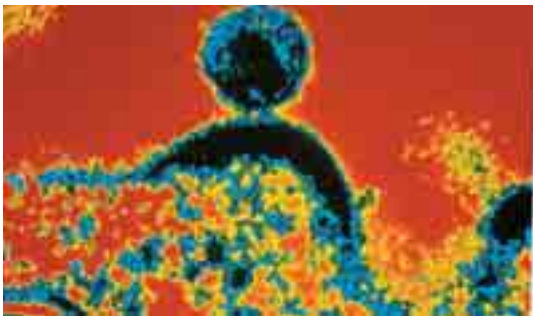


The HIV virus knows what it will fight against in a body it has never previously entered. Therefore, instead of attacking all the cells in the body one by one, it infects the very defense cells that would otherwise declare war on it, and installs itself inside them. A defense system whose elements have been damaged can no longer function.

to these molecules, Who knows the properties of both organisms, Who created them, and Who watches and keeps them under His control at all times. These bacteria which enter the body in order to infect it possess a slippery membrane that makes them unrecognizable to the complement molecules, so that the latter fail to realize that these bacteria are uninvited and harmful guests.

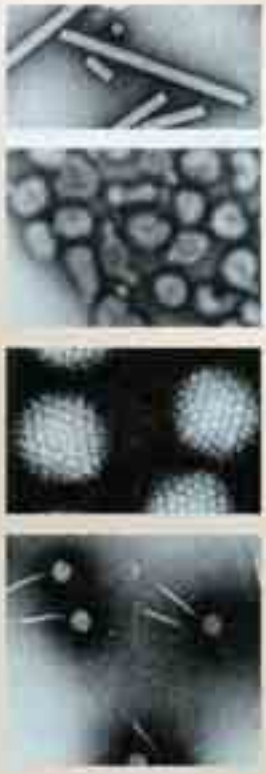
You might imagine that after this, the bacteria can continue on their way through the body unimpeded. But foreign invaders that overcome the first obstacle in the human body will encounter a second, even greater one. Giant macrophages tear the slippery membrane that prevents the bacteria from being recognized. They trap the bacteria with their long pseudopods and devour them. If they do not use this method, they release a substance that tags the bacteria. As the bacteria are marked, complement and other molecules recognize and destroy them.[52]

All this shows that the foreign bacteria that enter

the body, as well as the molecules that combat them inside the body, are all the products of a single Creator. The bacteria are clearly aware of the kind of dangers they will face. The body's cells, on the other hand, have taken precautions against bacteria that might enter the body, long before they ever do so. This, of course, is just one of the instances created by Almighty God, Lord and Absolute Ruler of the universe, to reveal the truth of His creation. He reveals this truth in verses:

> **Say: "I seek refuge with the Lord of humanity, the King of humanity, the God of humanity ..." (Surat an-Nas: 1-3)**
>
> **Exalted be God, the King, the Real. There is no god but Him, Lord of the Noble Throne. (Surat al-Muminun: 116)**

AIDS, a fatal disease for which no cure has yet been found, is another important example of how both aggressor and defender are the work of a single Creator. The HIV virus which causes the disease enters the body with a tactic already planned against the body's defense mechanism. It knows what it will be fighting against in a body it has never seen before. For that reason, the moment it enters the body, rather than concealing itself like other viruses in any random cell, it enters the helper T-cell charged with directly eliminating intruders in the body and reporting this to the other defense elements. It damages the cell and prevents it from reporting the danger. A system whose elements have been damaged no longer functions as effectively as before. As a result, the body is no longer in a position to combat even a simple flu infection. Due to the HIV's damaging effect on the immune system, even a flu virus can prove deadly.



Tobacco mosaic virus (TMV)

Influenza virus

Adenovirus

Lambda bacteriophage

Remove just one element from the immune system, and that system can serve no purpose. The leukocytes comprising the system are irreducibly complex. They represent a perfect example of the superior works created by God.

If There Were No Defense Cells ...

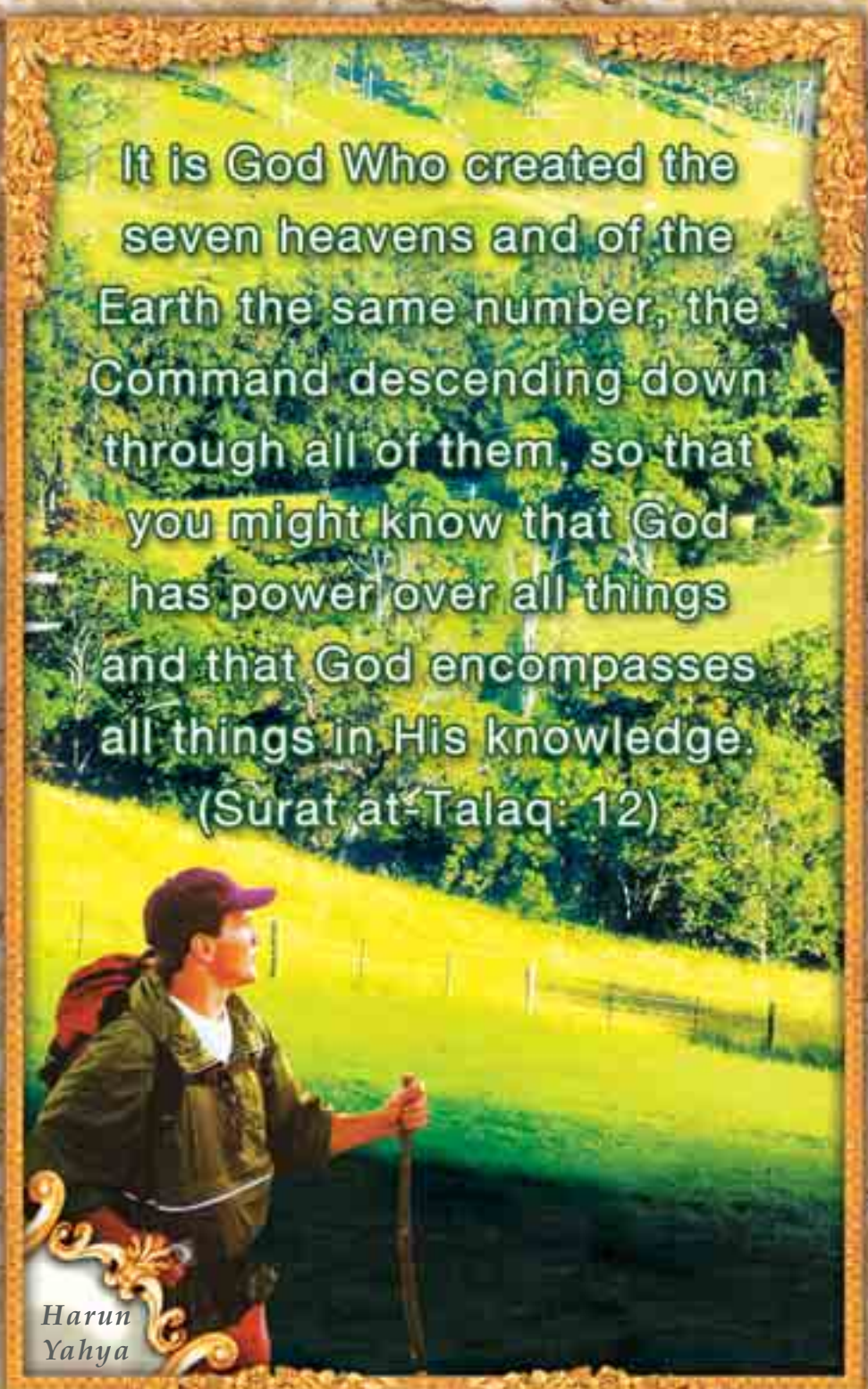
The cells that make up the defense system act dependently of one another through a complex network. Some perceive the danger, others begin the initial halting operation, some notify the other defense cells, others deal the lethal blow to the enemy, and still others wait in the wings to serve as reminders in the event of future attacks. Remove just one link from this chain, and you are left with no defense system at all. For example, if you remove the helper T-cells, then the killer cells left in the body will be unaware of danger. If you remove the B-cells and killer T-cells, then the

helper T-cells will have no superior unit to which to report any threat.

If you do away with the natural killers, then it will be impossible to eliminate resistant enemies that enter, and any single bacterium will cripple the body. Remove the memory cells, and the body will have no immunity to foreign organisms, and the defense cells in the body will have to fight the same enemy time and again, leading to a rapid weakening of the defense system, leaving the body exposed to new infections and repeatedly the same illnesses.

Therefore, the leukocytes comprising the bloodstream's defense system are *irreducibly complex*. It's impossible to reduce or remove a single component of this mechanism. If any one part of the system is missing, then the system cannot function. As a result, even a common cold virus will soon lead to death. Since no virus entering the body will encounter any obstacle, it will be able to enter any cell it chooses and reproduce as much as it likes. Under normal conditions, the production of cells is tightly supervised. Yet since the virus will not be subjected to any similar supervision, soon it will occupy the whole body by using the means available in the cell. That is why AIDS sufferers and people whose immune systems have been destroyed by such techniques as chemotherapy are so extremely vulnerable to illnesses of all sorts. If defense cells are lacking, then a system by which the body can defend itself needs to be added. If this is impossible, the inevitable consequence is death.

Like AIDS, leukemia is a fatal disease resulting from a deformation of the defense cells. The leukocytes in the blood assume different shapes and are no longer able to function. This leads to retardation of the


It is God Who created the seven heavens and of the Earth the same number, the Command descending down through all of them, so that you might know that God has power over all things and that God encompasses all things in His knowledge.
(Surat at-Talaq: 12)
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general defense mechanism. In almost all types of leukemia, cells multiplying in an uncontrolled manner spread to all the surrounding tissues. Therefore, the tissues are thus impaired and soon become unable to discharge their previous functions.

The fact that the tissues with leukemia begin rapidly producing new cells gives rise to a need for excessive nutrients in the body fluids, particularly amino acids and vitamins. The body's energy thus quickly decreases. Excessive amino acid use increases the consumption of normal body proteins. The tissues with leukemia thus grow, and other tissues are weakened. Even if the system continues in this form, it may soon lead to death.[53] The most effective way of treating patients is transplanting into their systems new bone marrow that can produce sound and healthy white blood cells.

As we have seen, it is impossible for the system to have emerged through evolution, because it serves any purpose only when all its components are present together. This system is an example of a perfection created together with all its properties and that operates with the coordination of all its components. It is therefore important evidence for creation. Once again, we find ourselves faced with the flawlessness in God's creation. He reveals this fact of creation in a verse:

This is God's creation. Show me then what those besides Him have created! The wrongdoers are clearly misguided. (Surah Luqman: 11)

PLASMA: THE LIQUID THAT ENABLES THE CELLS TO MOVE

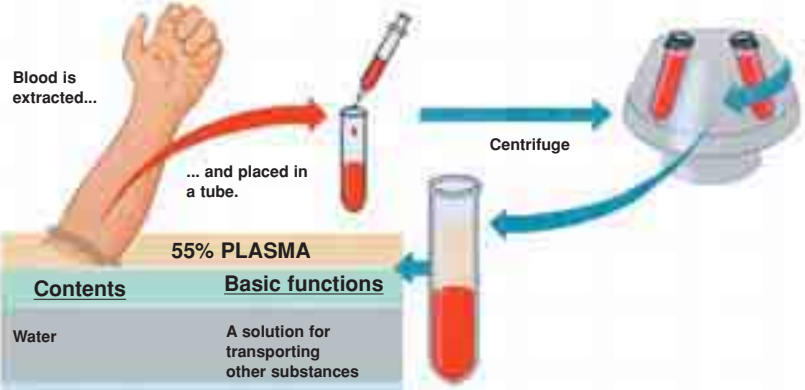
To fulfill their functions, erythrocytes and leukocytes have to travel throughout the whole body. It is impossible for them to do this by themselves, however. Even though cells have various mechanisms that allow themselves to move, still there needs to be a fluid for them to move in. This fluid, which travels to every point in our bodies every second, together with the various forms of blood cells, is plasma.

Plasma constitutes 55% of the blood. It contains 90% water, along with albumin that is used in regulating that water level, globulin used in transporting vitamins, fibrinogen used in blood clotting, glucose and other nutrients, ions used in regulating intracellular fluid pH and levels, fats, amino acids and vitamins, and dissolved gasses such as oxygen, carbon dioxide and nitrogen.[54]

With the substances it carries and the properties it possesses, plasma performs vital functions in the body, the most important of which is the carrying of nutrients and wastes. Other important features are allowing blood pressure to remain at a specific level, and heat dispersal. In addition, plasma is responsible for maintaining

acid proportions at a specific level in other tissues.

Since plasma is the fluid component of blood, its level can decline by 50% during excessive perspiration, or can rise by 60% when large amounts of water are consumed. The water contained in the plasma is the basic element of blood, but there are also solids in plasma, such as proteins. These include fibrinogen, which permits blood clotting (to be examined in depth in the section on blood clotting), the albumin that regulates the level of blood cells and body fluid, and globulins rich



55% PLASMA

Contents	Basic functions
Water	A solution for transporting other substances
Salts (electrolytes) Sodium Potassium Calcium Magnesium Chloride Bicarbonate	Regulation of osmotic balance, pH balance and membrane permeability
Plasma proteins Albumin Fibrinogen Globulins	Osmotic balance, pH balance Blood clotting Defense (antibodies) and fat transportation
Substances carried in the blood Nutrients (glucose, vitamins, amino acids) Metabolism wastes (urea, uric acid) Respiratory gasses (CO_2 and O_2) Hormones	

Plasma, which makes up 55% of the blood, is exceedingly important because of the substances it carries and the properties it possesses. Many processes that keep the body in balance, from the transportation of nutrients and wastes to the regulation of blood pressure, depend on the characteristics and wide mobility of plasma.

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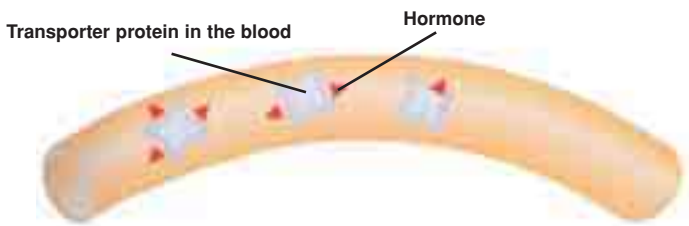
in antibodies. From our point of view, it will be useful to examine the highly important albumins.

Albumin: An Intelligent Transporter

In numerical terms albumin is the most abundant protein in plasma and assumes a transport function in the blood. However, albumin is no ordinary carrier. It transports fats such as cholesterol, hormones and the toxic yellow pigment bilirubin, a gall bladder product. In addition, it binds mercury and penicillin and other antibiotics. It releases toxins in the liver and carries nutrients and hormones to the requisite destinations.

The way fats are transported by a protein in the body is of great importance. If fats were not transported by albumin, then all the fat molecules would clump together in the blood and float in an unregulated manner, just like globules of fat in a bowl of soup. That would soon lead to blood-vessel congestion and death.



Transport in the body is carried out by means of the blood. The protein that carries various substances in the blood fluid is albumin. It transports cholesterol, fats and toxins such as bilirubin, as well as various hormones and nutrients. It deposits toxins in the liver, and carries nutrients and hormones to the relevant destinations.

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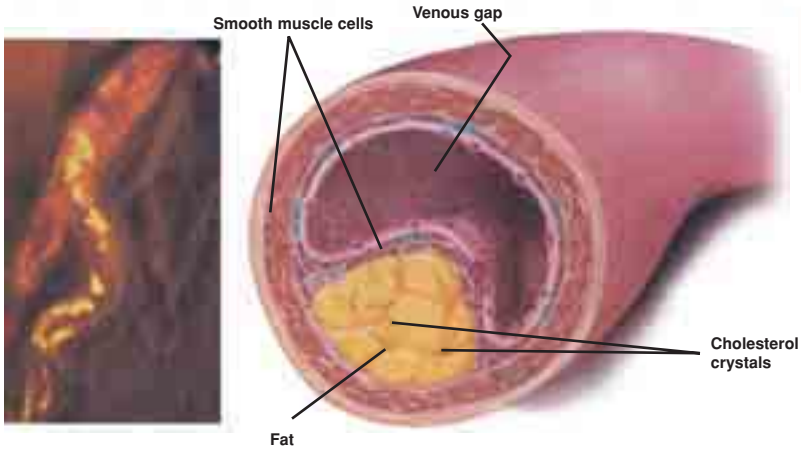


If fat molecules were not transported by albumin, they would stick together and float in the bloodstream in an uncontrolled manner. This would soon lead to blocked blood vessels, organ loss, or even death.

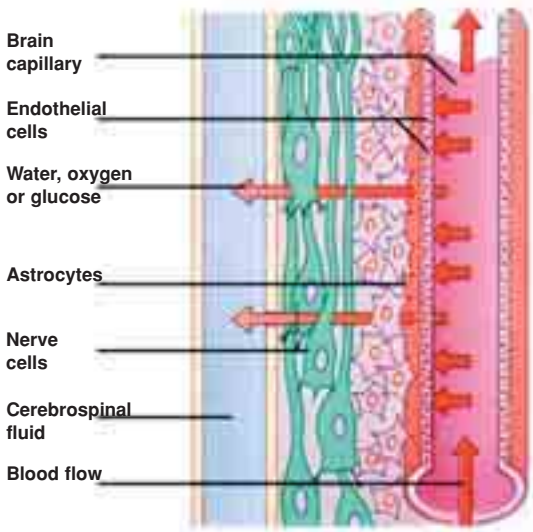
Hormones are responsible for the distribution of messages in the body; and they too must have a means of transport. It is again the protein albumin transmitting hormones to the necessary locations. If albumin lacked this property of carrying hormones, then no signals, from hunger to thirst, would reach the relevant regions; and all functions concerning the human body, from growth to development, would come to an end. Although it needed water, the body would be unaware of this. Albumin is a protein specially created in order to be able to perform these message-bearing functions and one which literally *knows* what needs to be transmitted where.

Nor are albumin's duties limited to these alone. Nutrients moving in the arteries have to be able to pass through the tissue walls in order to reach the interior cells. Although the tissue wall has a great many

pores, it still permits no substances to pass through it. The main element enabling nutrients to enter the tissues is blood pressure. Thanks to the force of blood pressure, nutrients are able to reach the requisite locations. However, there is also the possibility that the level of substances "pumped" to the tissues by means of blood pressure will be greater than normal. Excessive fluids in the tissues will lead to edema. In order to prevent this, albumin enters the equation as a competitor to blood pressure, pulling liquid back into the blood. Because of its higher concentration of albumin, the blood absorbs water just like a sponge. Were it not for albumin, the body would swell up like a dry sponge left to soak in water.

In the brain, however, substances in the blood need to pass through the vessel walls in a rather different way. The brain is a very sensitive organ, and if the substances in the blood were

The brain is afforded very special protection. Substances in the blood pass through the so-called brain/blood barrier after being subjected to a special inspection. The endothelial cells in the capillary walls constitute a literally impassable barrier. Substances in the blood can reach the brain cells in question only if they are able to pass through it.



to enter the brain tissues in an uncontrolled manner, they could damage the neurons. The brain therefore has a very special protection. Tissues in the brain are covered by dense layers of cells. In order to enter, substances in the blood literally have to undergo passport checks as they pass through these cells. Yet even if these substances do clear "passport control," once they enter the brain tissues, they are still not left unsupervised. Specific brain cells are densely packed between the veins and nerve cells and are literally attached to the tissue walls. Substances in the blood can reach the brain cells in question only if they are able to pass this tight security.[55]

Some organs in our bodies need to be protected more vigilantly than others, and every cell in the body seems aware of this. The main organ requiring protection is the brain. Damage to the brain will lead to problems that impact on the entire body. Anything that damages the brain's sensitive regulation and structure thus means damage to the body's equilibrium. Therefore, this delicate organ is protected by highly detailed, complex mechanisms.

Aware of this special protection, the cells behave very carefully. Because the heart, too, is aware of this delicacy, it pumps blood to the brain in very careful and measured amounts. The sentries in the brain admit substances accordingly, since they are also aware of this sensitivity. In short, every mechanism in the body assumes the task of protecting its central headquarters. All these processes, which have been described in terms of organs and structures knowing about them, are in fact all signs of God's infinite wisdom and knowledge which are manifested in living things. This needs to be constantly borne in mind.

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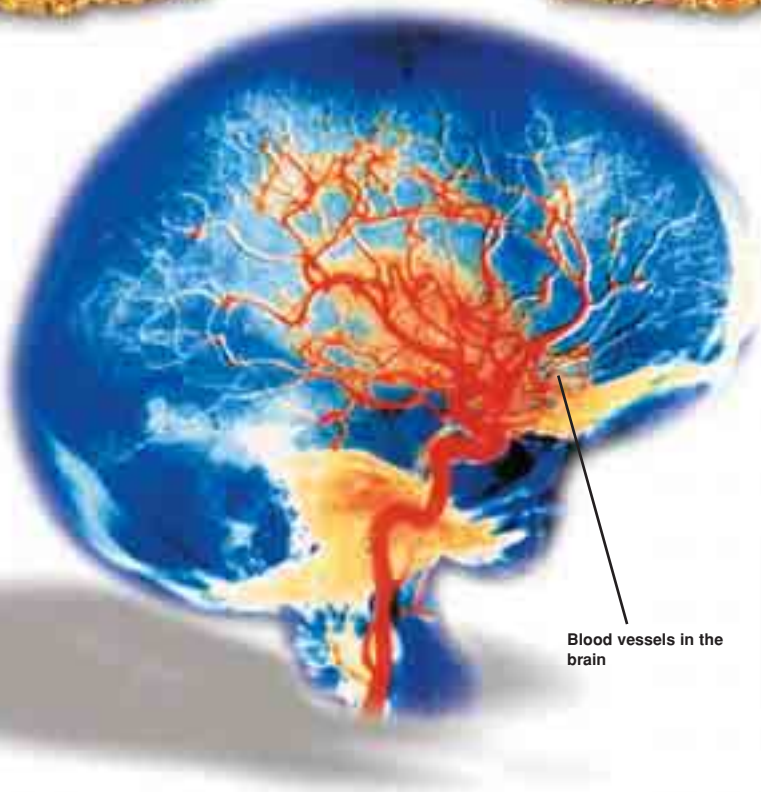
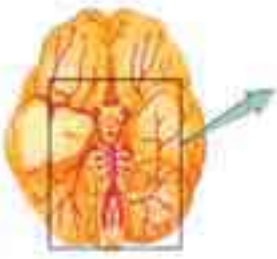


Every cell in the body is seemingly aware that the brain must be better protected than the other organs, and accordingly, act with great care. For example, the heart pumps blood to the brain in a special and measured way. This is a very special and impeccable precaution created by God to preserve brain function.



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The brain's special protection once again proves that there is a regulated system within the body. Cells, consisting of unconscious organelles, certainly cannot possess such awareness. God protects the brain and the cells that comprise it at every moment and preserves them. This sensitive overseeing continues at all moments. If it did not, lack of control would soon lead to death.

Thrombocytes: The First Agents in Coagulation

Another important element in the blood, thrombocytes, or platelets, are cells charged with the initial repair of damaged tissue and initiating a series of events so that the blood in that region can clot. Thrombocytes live in the blood for 7 to 9 days. Their total volume in the bloodstream is very small, however: The human body contains no more than a teaspoonful of thrombocytes.[56]

In fact, thrombocytes are not real cells at all. Colorless and lacking nuclei, they consist of particles that separate from the bone marrow's large cells.[57] The main reason for their existence is that they constitute the first stage necessary for blood coagulation and are exceedingly important for the closing of tears that occur hundreds of times a day in the blood vessels, and of which you are generally unaware.

After being released from the bone marrow into the bloodstream, thrombocytes tend to attach themselves somewhere. However, as evidence of the superior nature of their creation, thrombocytes do not adhere to the regular endothelial cells that line the blood vessels. Were

they to do so, they would accumulate inside the vessels—clot, in other words—and lead to vein blockages. The blocking of just a single vein leading to the brain generally results in a stroke, or death.

These cells' adhesive properties emerge only when the endothelial tissue in a vein is damaged in some way. When the endothelial cells are harmed, the structural protein underneath them, known as collagen, is exposed. To the thrombocyte, the structure of collagen is very different from that of the cells lining these veins, and so their adhesive properties immediately come to the fore.

From 15 to 20 seconds after the opening of a wound, the clotting process begins. Thrombocytes arriving at this region deposit there the substances they contain, one of which is ADP, which causes a number of changes in the thrombocytes' characteristics. The thrombocytes begin to swell, assuming irregular forms. Numerous protrusions extend from their surface, which greatly increases their adhesive properties. This change taking place in the thrombocytes is a vital one, because the other thrombocyte cells, traveling haphazardly in the plasma, adhere to these thrombocytes that have undergone this alteration. The ADP deposited in the environment is the messenger that notifies the other thrombocytes of the situation.

This phenomenon takes place exceedingly rapidly. The wound inside the vein is shortly blocked up by means of this cooperation among thrombocytes, setting up the necessary condition for the subsequent process of blood coagulation. If the tear in the vein is a small one, then the thrombocyte plug alone is sufficient to halt the blood flow.[58]

The healing process goes further than this, how-

When you cut yourself, the clotting elements in your blood go right to work. Within 15 to 20 seconds, the coagulation process has already begun. The duties of each element in this mechanism are of vital importance. It is impossible to remove any one of them from the irreducibly complex sequence, or blood clotting does not occur.

ever. The endothelial cells that make up the blood vessel walls release a protein, known as *von Willebrand factor* (VWF), that makes it easier for thrombocytes to adhere to the damaged vein wall, and also ensures that they perceive the trouble spot and do not pass by it. VWF first binds to the collagen in the damaged region, and the adhering of thrombocytes to the collagen also takes place in this way. It should

therefore be claimed that the endothelial cells behave intelligently, recognize the structure of collagen, which is very different from their own, and make a conscious plan to assist the thrombocytes.

Yet these are only mere cells. They have no chemical knowledge or laboratories with which to produce a protein that will facilitate binding. They have no consciousness with which to identify damage, develop measures against it and thus preserve the body's life. These cells with their superior features—present and ready to serve the same purpose in every human being on Earth—cannot be the product of either human intelligence or an imaginary process of evolution. These can only be the work of God, Who endows all things with order, magnificence and flawlessness. God is He Who is sufficient to meet the needs of all things (*Al-Kafi*), Who surrounds them (*Al-Muheet*) and Who has the might to perform what He wishes, and when (*Al-Qadeer*). Only to Him are thanks given, and only He is the Praiseworthy (*Al-Hameed*).

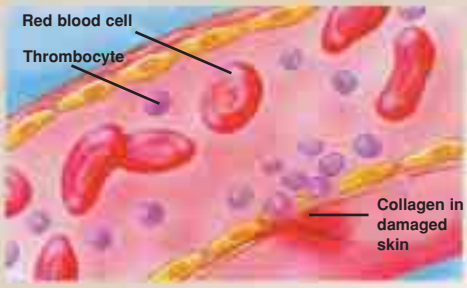
He is the Innovative Creator (*Al-Badee'*). In the Qur'an this truth is stated thus:

> **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)**

To return to the thrombocytes, these special cells perform a very important duty at the beginning of the blood coagulation process. Every element in this mechanism is of vital importance. It is impossible to do away with any one. For example, the absence of or deficiency in the protein VWF, which serves to facilitate thrombocyte binding, will spell the complete disruption of the blood clotting system.

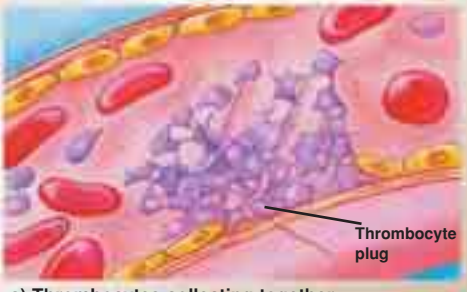
Defects in the clotting system cause serious diseases that can be treated only under special conditions, or sometimes not at all.

These miraculous entities possess very important features. These saviors, consisting of just single cells, contain within themselves special contractile proteins that permit expansion and contraction inside themselves, which proteins serve to



a) Thrombocyte plug

b) Thrombocyte movement



c) Thrombocytes collecting together

Thrombocytes are one of the crucial elements in the clotting process. In the wake of damage to the body, a number of essential and miraculous changes in the thrombocytes' structure take place. The primary blocking of the wound, which takes place with various enzymes and proteins, is especially vital. It is impossible to remove any of the elements that comprise this mechanism from the equation.

make the blocking brought about by the thrombocytes even more powerful.[59] Their duties do not come to an end with the initial clotting they set up. After the clot has formed completely, they continue their duties in different ways. This will be examined in more detail in the chapter on *Blood Coagulation*.

As the thrombocytes continue with this work, the body also takes a number of precautionary measures. Inside it, flat muscles in the walls of the damaged veins begin to contract, to reduce blood pressure and the amount of blood flowing to the region where the wound occurred. Thus while the thrombocytes are doing their jobs, any excess blood that might impair the clotting process is prevented from heading to the region, and the body will not lose too much blood.

These most rational measures are taken in even the smallest scratch in every vein in your body. You are probably unaware of this, however, and may pay no attention to any small scratch on your hand. Yet at that very moment, a great deal of activity is going on in that region. You do nothing about that tiny scratch, and you do not need to try and staunch the blood leaking from it. Indeed, you could not stop that flow even if you wanted to. Yet your cells with their perfect organization, charged with clotting the blood, take all the necessary precautions for you.

While all this is taking place, one danger arises that you may never have thought about. While thrombocytes adhere to one another and close up the wound, there's also the possibility of this clotting being carried outside the region in question and blocking a nearby vein just a millimeter or two in diameter. It is essential that this danger be averted at the wound site. Naturally, in this perfect system a

precaution against this threat has also been taken. Against this danger, the arterial wall synthesizes a special compound, prostacyclin, which ensures that the thrombocyte plug forms only in the relevant place and halts once its job is done.[60]

Thrombocytes are merely cells. Their ability to never make a possibly deadly error is definitely not a property inherent in the cells themselves. It would be a violation of reason and logic to believe that they carried out all this coordination and organization of their own accord. The absolute existence and control of God can clearly be seen in this splendid order within our bodies. God is He Who creates all things flawlessly, the Almighty.

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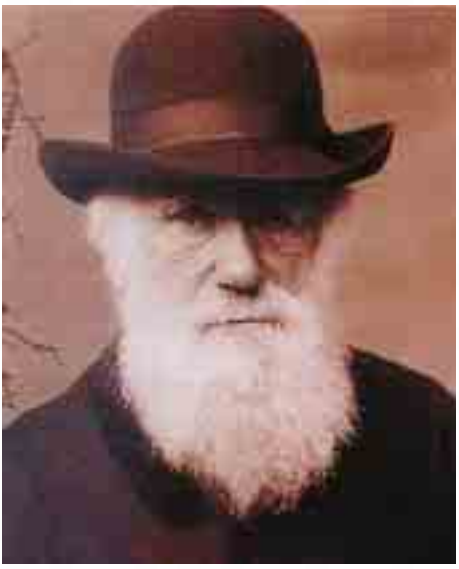
BLOOD COAGULATION: ONE OF THE PERFECT INSTANCES OF CREATION

When Charles Darwin was climbing the rocks of Galapagos Islands—pursuing the finches that would eventually bear his name—he must have cut his finger occasionally or scraped a knee. Young adventurer that he was, he probably paid no attention to the little stream of blood trickling out. Pain was a fact of life to the intrepid island explorer, and it had to be borne patiently if any work were to get done.

Eventually the blood would have stopped flowing, and the cut would have healed. If Darwin noticed, it would not have done him much good to speculate about what was going on. He didn't have enough information to even guess at the underlying mechanism of clot formation; the discovery of life lay more than a century in the future.[61]

For an evolutionist, a great many things in nature cannot be explained. If a mechanism is too complex to have come into being spontaneously, and if all its component parts must be present in order for it to be able to function, then this is sufficient evidence to entirely invalidate the theory supported by the evolutionist in question. Throughout their lives, evolutionists—Darwin included—have encountered a great many mechanisms of *irreducible complexity.*



Had Darwin known of the clotting mechanism that took place when he cut himself, no doubt he would have been faced with another terrible dilemma for his theory. Present-day Darwinists are well aware of this. Yet the way that they still support the theory shows that Darwinism is not a theory as much as an ideology developed in opposition to belief in God and the fact of creation.

Perhaps one of the most important of these phenomenon is the blood clotting or coagulation, which takes place in an entirely natural manner in our bodies.

Darwin wrote that the thought of the human eye gave him chills because of its extraordinary complexity. But there were many other complex systems besides the eye, including blood coagulation which he did not know about in his day. As Professor Michael Behe stated, had Darwin known by what stages blood coagulation came about when he cut his hand, no doubt this would have represented another insoluble dilemma for his theory. In our time, some evolutionists do see this important fact and witness the phases of this extraordinary mechanism in their laboratories. However, despite this miraculous phenomenon, of which not even a single phase can be explained in terms of evolution, the theory still has its proponents, once again proving that this ideology of

Darwinism is a dogma developed against religion, and put forward to deny the fact of creation.

What Happens in the Body after an Injury

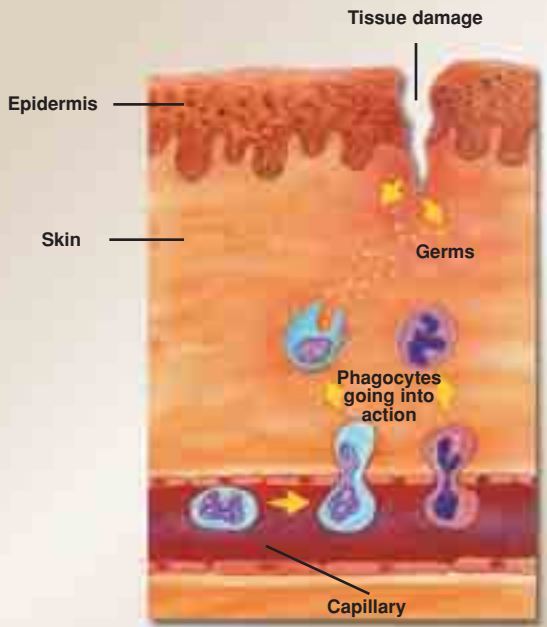
Pour a quantity of liquid in a container and then make a hole in the bottom. No matter what the liquid may be, it will begin pouring out of the hole, and will continue doing so until the container is empty. You need to close the hole in some way; otherwise you cannot halt the flow. The only liquid on Earth capable of closing up a hole by itself, by spreading a microscopic net over it, is blood. Even more miraculously, the blood that does this is moving at an exceptional relative speed.

When you cut yourself, you may be unaware of the processes that take place at the site. You are sure that the blood will soon stop flowing in minutes and that the cut will heal and disappear within a few weeks. There is no need for you to do anything to staunch the flow and heal a small wound. Indeed, if the blood did not do this itself there is no way that you could stop it flowing and heal the cut. Whatever you do, you cannot prevent the blood flowing. In order to do so, you need the factors that cause the blood to coagulate. So what are these factors?

More than 40 substances cause clotting in the blood and tissues. Some of these initiate clotting, others accelerate it, and still others cause it to come to an end. In the body, clotting depends on a balance between the factors that accelerate coagulation and those that prevent it. Under normal circumstances, there should be more factors that prevent clotting than there are accelerating it. Thus there can be

no question of uncontrolled coagulation taking place in the body. The moment that more accelerating factors than decelerating ones occur, a vein may be damaged.[62]

When a vein is damaged, rather intense activity begins in the body. A few seconds later, all the nerves and repair systems in the body have been stimulated. As we saw earlier in discussing thrombocytes, the clotting mechanisms reduce the amount of blood being lost. Chemical substances released at the wound site activate the white blood cells against any infection. If the wound is a large one, then the brain enters a state of alarm, seek to regulate the body's impaired functions by having glands secrete chemical substances and a whole array of hormones into the blood. This is an extraordinary control mechanism created in the body by God.



When you cut yourself, some 40 different substances responsible for coagulation go into action. Within seconds, all the nerves and repair systems in your body have been stimulated. We are once again seeing a perfect control mechanism created in our bodies by God.

Both the taking of intense precautions in the event of serious damage and the beginning of the clotting process need to take place at once. In order for this to happen, an extraordinarily rapid communication system is essential. It takes only 50 milliseconds—a really dizzying speed—for nerves to send the brain information about the extent of the wound. The person concerned will often be unaware that a cut has occurred on the skin surface.

But if the bleeding is not stopped, then falling blood pressure and the reduction in the fluid level will damage all organs in the body, especially the brain. When brain functions slow due to loss of blood, first faintness occurs, followed in around 30 seconds by loss of consciousness. Then the kidneys, which function under normal blood pressure, will be unable

Stopping any bleeding in the body is of the greatest importance. If bleeding is not halted, then vital organs such as the brain and kidneys will suffer damage due to reduced blood pressure and fluid loss. But when you damage a vein, the factors that comprise this extraordinary clotting network go right to work.

to operate properly as a result of falling blood pressure. It is therefore vital that the blood flow be stopped at once.

The first steps are vital. Two seconds after a vein is ruptured, its wall contracts with a sudden spasm—a reflex, in other words. Arteries, which have thick walls, take other precautions and automatically close, thus reducing the blood flow to a minimum. The spasm is to the same extent as the bleeding in the veins. The reflex action in question may last for 20 to 30 minutes. Following this precaution, the thrombocytes enter the equation. Thrombocyte clot begins to develop in 10 to 15 seconds if the bleeding is severe, and in 1 to 2 minutes if minor. To a large extent, bleeding is halted.[63]

The wound now needs to close up completely, and the bodily functions must continue as before. The coagulation mechanism therefore now goes into operation.

A Fishnet with Extraordinary Properties

In a single book, it's impossible to examine in detail the 40 factors that influence coagulation in the blood. Therefore, it will be appropriate to introduce only the system's main elements. On the subject of plasma, it was stated that fibrinogen was one of the proteins contained in it. Fibrinogen is one of the most important elements of the coagulation process, and is the stable state of the blood-clotting material. Fibrinogen dissolves in plasma in the same way that salt dissolves in water. It continues to float in solution until a wound occurs anywhere in the body.

When a wound does occur, a protein enzyme known as thrombin breaks two of the three links in

the fibrinogen chain. This protein is now converted to *fibrin*, and is now in an active state. The severed fibrin surfaces possess adhesive sections, which cause other fibrins to approach and bind to them. This mass brought into being by fibrins sticking to one another is the primary clot produced to halt the bleeding. In the first phase, the first clot forms without too much detailed work. The objective here is to halt the blood, and also to perform first aid using as little protein as possible—in other words, to economize on protein.

Thrombin, which goes into action straightaway with the opening of a wound in the body, begins cutting all the fibrinogen links it finds. However, thrombin must not do this constantly or in any other location than that of the wound. If it acted independently in that way, then all the fibrins it severed would stick to one another, and uncontrolled clotting would take place in the bloodstream, leading to the veins becoming blocked. That being so, the thrombin has to be kept under tight control and instructed to act in the right place and at the right time.

At this stage, another connection proving the mechanism's irreducible complexity appears: another protein that sets thrombin in motion, known as Stuart factor. It severs the prothrombin in the blood plasma and turns it into active thrombin. However, if the Stuart factor were to turn every prothrombin it encountered into thrombin aimlessly, then the result would again be uncontrolled activity and the likelihood of clotting in the bloodstream. Therefore, Stuart factor must not be in a constantly active state in the bloodstream, but must await an order to go into action.

The command for Stuart factor to begin work-

ing comes from a protein called *accelerin*. However, accelerin is a neutral protein floating in the blood that has to be activated, and of course, a protein is needed to do this. Yet most surprisingly, the protein thrombin allows the accelerin to be activated, even though, as you'll remember, thrombin comes after accelerin in this sequence. So how does such an event take place?

A precautionary measure has been taken in the body to that end. Under normal conditions, a quantity of thrombin is always present in the blood. It is therefore the already present

When damage occurs in a vein *(below)* the particles known as thrombocytes *(top right)* release chemicals that initiate a string of reactions in order to prevent blood loss. One of these reactions is the production of fibrin, which forms a network that blocks the way for blood cells and plasma *(top left)*. Thus an emergency measure is taken to prevent blood loss.

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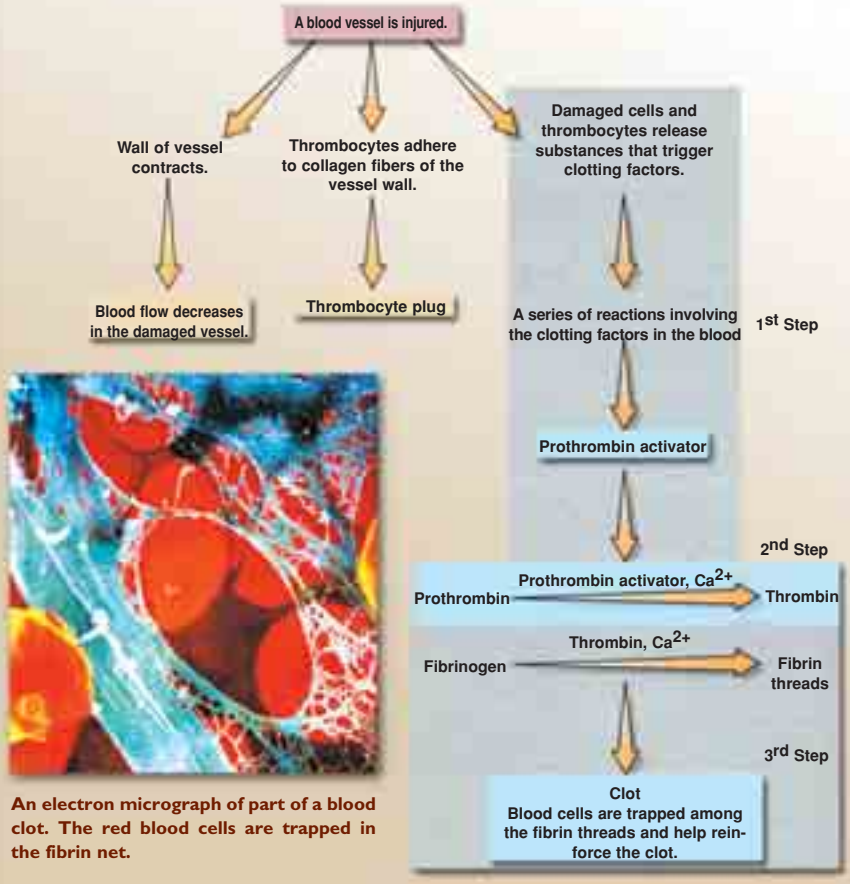
thrombin molecules that initiate this activity. Nonetheless, however, the way that these consecutive activations happen—and especially how the thrombin is set in motion—is not yet fully understood.[64]

In the stages described so far, the important thing is the extraordinary complexity of this incomparable system in the body. Furthermore, there are a great many other proteins and enzymes that have not been described in detail. Considering that there are 16 different enzymes producing thrombin alone, clearly the removal of a single enzyme in these phases will bring the entire system to a halt.[65] For example, if the Stuart factor does not convert the prothrombin into thrombin, then the thrombin will quietly pass by the fibrinogen, and the wounded individual will probably die from loss of blood. The activated, the activators and the elements that enable clotting to take place must all be present at the same time. This is *irreducible complexity*, from which not a single component can be removed.

After these descriptions, you can better understand the difficulty facing Darwinists. According to the theory of evolution, one of the countless proteins involved must inevitably have come into being first, and the others must later have come into being consecutively, over periods of time. However, no living organism can afford such a long waiting period. So long as the system is imperfect, *intermediate* stages will serve no purpose—for which reason there can actually be no such *intermediate* stages. Indubitably, this impressive system came into being and began functioning at once, with all its systems, enzymes and mechanisms. It is Almighty God Who creates this system with all its magnificent fea-

WHAT HAPPENS WHEN YOU BLEED?

An electron micrograph of part of a blood clot. The red blood cells are trapped in the fibrin net.



Clot formation in the injured vessel is a miraculous phenomenon. A great many factors and enzymes are involved in the clotting process, working in a chain. For example, there are 16 different elements producing thrombin alone. For just one of them to be left out of the equation will halt the clotting process. According to the theory of evolution, one of the countless proteins involved must have emerged first, with the others then appearing in sequence over very long periods of time. However, no living thing could afford even a brief waiting period. Such a system can only function when everything exists, fully formed. This shows us that these perfect systems are examples of God's creation.

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tures and complexity. He has created the heavens and Earth, and reveals His wisdom in every entity He creates. This is the truth that Darwinists are unwilling to accept.

Rational Measures in a Perfect System

The necessary precautions taken in a single process to protect the body are astonishing. Coagulation is just one feature of the body's defense mechanism. The endeavors of the thousands of cells that go into action to take precautionary measures are truly amazing.

If a clot has formed anywhere on your body, it soon begins puckering. The reason is that the clot starts contracting one or two minutes after it forms, and that the fluid within it departs in 30 to 60 minutes. This puckering does not happen at random, and the coagulation in your body is an example of the perfectly rational precautions taken by the cells.

The cells that go into operation during wound puckering are, again, the thrombocytes. In order for this to take place, thrombocytes release the contractile proteins we have already referred to. The puckering clot pulls together the torn edges of the veins and lets them fuse together again more quickly, assisting with the acceleration of coagulation. When thrombocytes go into action once more, they cling to the connections of the clot fibrins that form so as to reinforce these fibers. At the same time, they fix the diagonal bonds between the fibrins with a substance they release.[66]

For various reasons, the blood only coagulates over the wound site. When you consider capillaries just nine thousandths of a millimeter thick, you can clearly

see that this is the result of perfect organization and fine mathematical calculation, because it is essential for the blood to know where to clot, the needed amount and to stop clotting when coagulation reaches to the adequate level. At this point another protein enters the equation: Antithrombin, which halts all the proteins activated for blood clotting, one by one. Of course, countless enzymes work in order for antithrombin to become involved. These processes will be considered without entering into too much detail.

Everyone knows how sensitive a wound feels when it starts to heal. The slightest impact causes it to open up again and for bleeding to begin again. The body has taken a precau-

It is very important that blood should clot only over the site of the wound. The protein known as antithrombin stops the blood-coagulating proteins one by one, ensuring that the blood clots in the right place and in the right amount. A single hitch in this system will cause blood to coagulate in the vessels, which in turn will lead to death.

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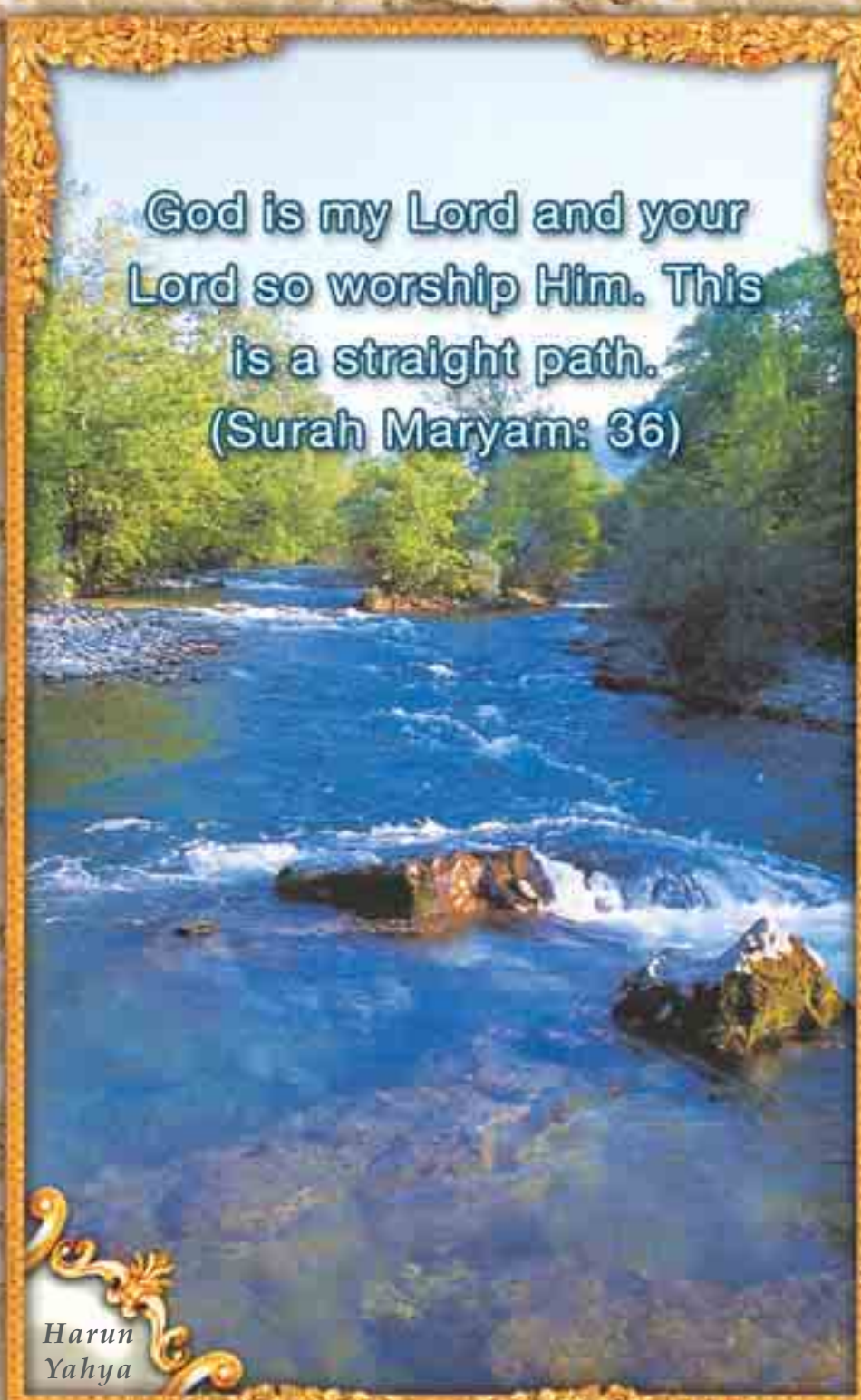

God is my Lord and your Lord so worship Him. This is a straight path. (Surah Maryam: 36)
Harun Yahya

tion for this also. A protein known as *fibrin stabilizing factor* squeezes together the fibrins making up the clot by attaching them tightly to one another. If there were no such reinforcing factor, then the wound would immediately open up again with your ordinary, day-to-day movements, and that region could never heal.

Another measure concerns the removal of the clot. The scab that forms once a wound has healed also has to be broken down again. An enzyme called plasmin assumes this responsibility. Plasmin attacks the fibrins and tears the clot apart by severing them one by one. In fact, plasmin begins doing so from the moment the fibrins first form. In other words, as the fibrins come together to form the clot, the plasmin is busily trying to destroy them. The timing of these two processes has been created with such a perfect equilibrium that while the plasmin is busy attacking the fibrins, the wound heals. The faster the fibrin formation, the slower their removal by the plasmin, so that the two processes finish at exactly the right time.[67]

Even someone who knows only the broad outlines of this mechanism as described here can comfortably conclude that any event occurring randomly in such a system will inevitably damage it. That being so, evolutionists need to explain how chance came to bring about a protein so important for coagulation and located it in the blood. What random event realized the need to produce another protein in order to set it in motion and accordingly formed an interconnected chain? Which coincidence has taught the protein to come into action when there is an injury to the blood vessel, and which coincidence has stopped the protein's activity when

the injury has healed? How could these coincidences occur in a flawless manner, in the same sequence, in millions of people, and how come they never damage this special sequence in the blood-clotting system? Why does thrombin never go into action before accelerin, and why does fibrinogen not spontaneously initiate clot formation? Is it possible for even a single stage of the many interconnected ones that comprise this extraordinary system to come into being by chance?

Not a single enzyme in a single step of this order, with such impressive details and exceedingly sensitive timing and balances, can form by chance, of course. It is Almighty God Who creates the whole system and every detail in that system, Who rules all things, and Who maintains all the functions under His control. God has created all the systems in our bodies with great complexity and perfection. Evidence such as this clearly reveals the invalidity of evolutionist claims regarding chance, and is sufficient to prove the fact of creation. This is a major truth, which Darwinists can clearly see, and which they sometimes even admit. Yet they persist in their denial in the face of all the facts. God reveals in the Qur'an:

> **Then inquire of them: is it they who are stronger in structure or other things We have created? We created them from sticky clay. No wonder you wonder [at God's creative power as well as at the blind arrogance of those who deny it] as they laugh with scorn! (Surat as-Saffat: 11-12)**

A Fully and Perfectly Functioning System

What would happen if just one of the interconnected links in the chain of this magnificent system were


... Say: "Are the blind and seeing equal? Or are darkness and light the same? Or have they assigned partners to God who create as He creates, so that all creating seems the same to them?" Say: "God is the Creator of everything. He is the One, the All-Conquering."
(Surat ar-Ra'd: 16)

absent? This is a most important question that totally invalidates all evolutionist claims on the subject. When you remove just a single link in this sequence, the blood will be unable to perform its coagulating function.

What kind of consequences might this have? Under normal conditions, a person would not feel the lack of Stuart factor or some other protein. However, the moment bleeding starts anywhere in the body, that lack will immediately reveal itself, and the consequences may even be fatal. The bleeding that begins may never stop, and even a very small cut may still represent a major problem.

That is, if the bleeding is external. Internally, sudden internal bleeding begins to inflict serious harm on the joints and cartilage, and if the bleeding cannot be halted, then death is inevitable.

The medical condition of hemophilia, which prevents blood coagulation, is the most important example of this, in which one single member of the clotting system in the blood is unable to fulfill its function. The absence of a single factor makes all the others in the entire system redundant and useless. Blood that fails to coagulate will constantly flow from any wound that opens up. Unless external pressure is applied, the wound will never heal. Blood transfusions are generally performed to resolve this problem, or else a coagulating factor is applied directly to the region.[68] If the medical interventions in question are not performed, then there is no other way of halting the bleeding.

One proof that the imaginary process of evolution never took place is the perfection and complexity in the clotting system. According to Darwinists, every

one of these factors came into being in stages, yet each stage is functionless on its own. The coagulation system can start to function only after the passing of millions of years, when all its elements succeed in coming into being, all *by chance*. There's absolutely no doubt that no living organism can afford to wait for such a development. This fact alone is sufficient to show that evolution is a completely illusory concept.

Torben Hakier, author of the book *Mechanisms in Blood Coagulation, Fibrinolysis and the Complement System*, expresses the irreducible complexity in the clotting system:

> *A system of this kind cannot just be allowed to free-wheel. The success of the coagulation process is due to the finely tuned modulation and regulation of all of the partial proteolytic digestions that occur. Too little or too much activity would be equally damaging for the organism. Regulation is a central issue in blood coagulation.*[69]

Michael Behe, a professor of biochemistry from Lehigh University, describes how not a single link in the clotting chain, and not even a single one of the genes comprising that link, could have come into being by chance, as evolutionists would like us to believe:

> *So making a new blood-coagulation protein by shuffling is like picking a dozen sentences randomly from an encyclopedia in the hope of making a coherent paragraph.*[70]

The impossibility of such a system coming into being by chance is calculated as follows:

> *Consider that animals with blood-clotting cascades have roughly 10,000 genes, each of which is divided into an average of three pieces. TPA [a clot-dissolving enzyme] has four different types of domains. By variously shuffling, the odds of getting those four domains together is 30,000 to the fourth*

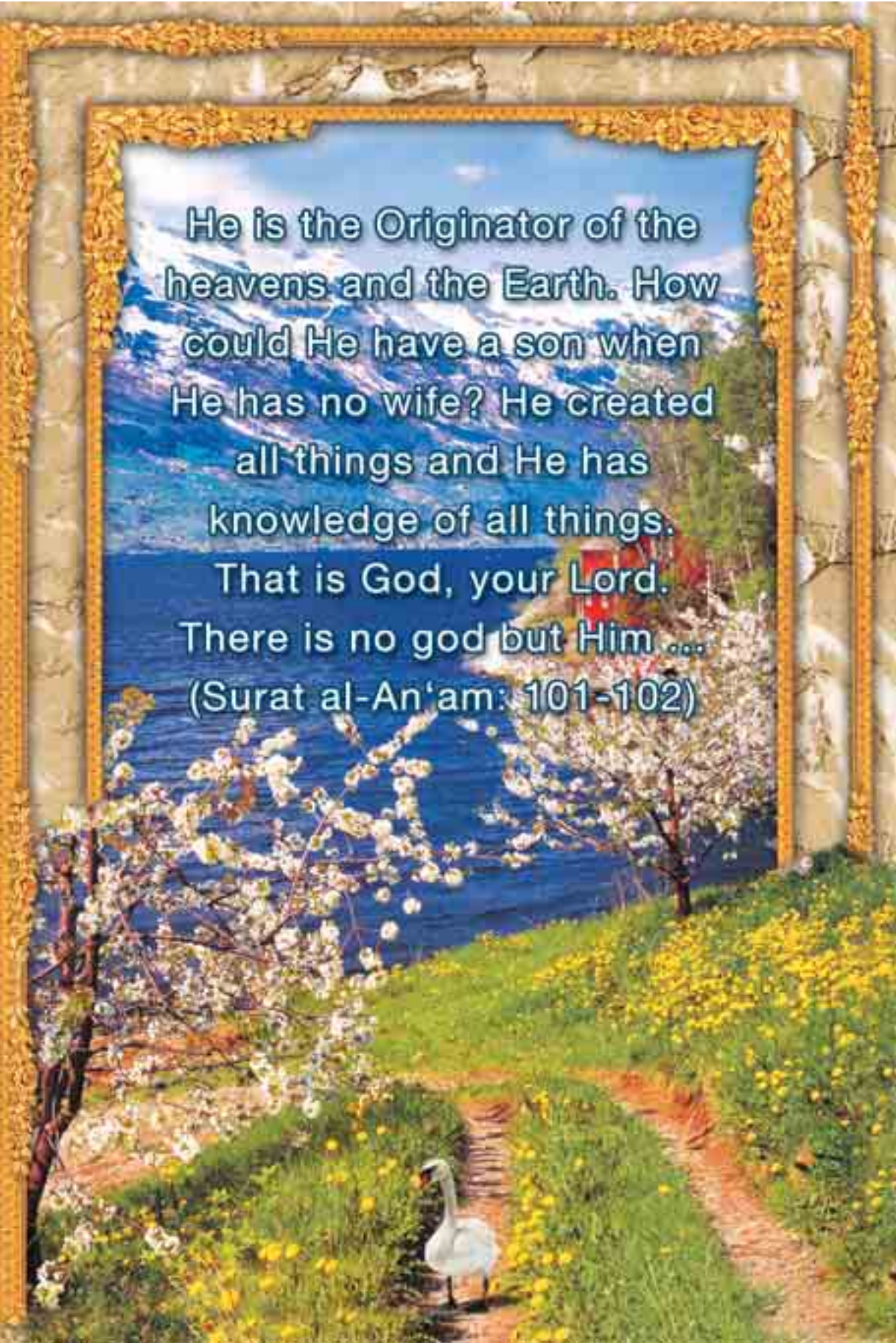
power, which is approximately one-tenth to the eighteenth power.[71]

As Behe states, *"no one on earth has the vaguest idea how coagulation cascade came to be."*[72] The system is too complex and flawless to have come into existence by chance, and is so perfect that it can only be the work of a sublime Creator. To comprehend the existence of the Creator, Whose creative artistry prevails on Earth, is also to understand that an incomparable intelligence also emerges with supreme magnificence in our bodies, in every stage of the systems that are invisible to the naked eye. Anyone capable of reason will have no hesitation over perceiving these facts. The absolute existence of God, in all His glory, is plain for all to see. God describes His flawless act of creation in a verse:

> **It is He Who created you from earth, then from a drop of sperm, then from an alaq [embryo], then He brings you out as infants, then so you may achieve full strength, then so you may become old men—though some of you may die before that time—so that you may reach a predetermined age and so that hopefully you will use your intellect. (Surah Ghafir: 67)**

The Theory of Evolution Cannot Account for the Blood-Clotting System

When Michael Behe first introduced the concept of irreducible complexity, he cited the blood coagulation mechanism as his principal example. From among all the countless examples of irreducible complexity in the body, he selected this system in particular as an example of the superior organization exhibited both separately and together by the


He is the Originator of the heavens and the Earth. How could He have a son when He has no wife? He created all things and He has knowledge of all things.
That is God, your Lord. There is no god but Him ...
(Surat al-An'am: 101-102)

components that comprise this system.

Before too long, Behe's statement on the subject of blood clotting attracted considerable reactions from evolutionist circles. The way he described the features of such a complex system, plus his scientific demonstration of the impossibility that these could have evolved independently of one another, presented a major challenge to the theory of evolution. One of the first who lost no time in reacting was Russell Doolittle, a professor of biochemistry at the University of California, San Diego, and a dyed-in-the-wool evolutionist, whose field of expertise in his 35-year academic career is blood coagulation.

Doolittle claimed that in a new laboratory study, he had proved it was possible to remove two compounds in a rat's blood-clotting system. According to him, rats were able to survive without difficulty even in the absence of these two compounds in their coagulation mechanism. In fact, however, the situation was rather different. Doolittle had either misread the results of the study, or else ignored a few important points in order to mislead people. The reference in which the results of the study were published[73] clearly stated that these rats suffered severe health problems and had no functional clotting mechanism at all. In other words, contrary to what Doolittle claimed, the rat coagulation system was not *reducible*.[74]

Doolittle made another claim based on the similarity of the proteins involved in clotting.[75] He claimed that the similarity in the amino acid sequences in proteins were the result of their deriving from a common ancestor and suggested that the system could have evolved in this way over millions of years. According to this evolutionist conjecture, the protein sequences contributing to the coagulation

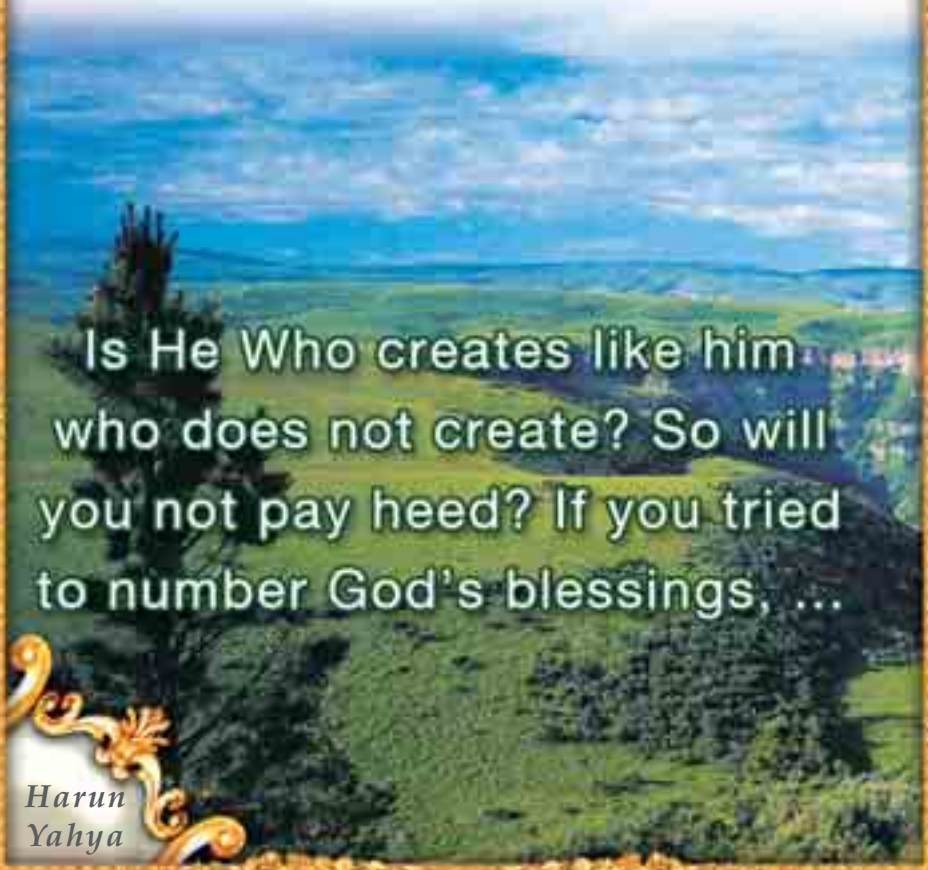
processes resemble one another, as well as other proteins not involved in the process. Therefore, these all must come into existence as a result of the same gene being copied. This means that they all must have emerged, allegedly, from a single common forerunner. Proteins formed from copies of this imaginary forerunner were subjected to gradual and minute alterations until they produced all these similar proteins, albeit with very different functions.

To this so-called "greatest claim" put forward about the imaginary evolution of the blood-clotting mechanism, Michael Behe provides the following reply:

> *With the proteins of blood clotting, however, the task of adding proteins to the cascade appears to be horrendously problematic. With one protein acting on the next, which acts on the next, and so forth, duplicating a given protein doesn't give you a new step in the cascade. Both copies of the duplicated protein will have the same target protein which they activate, and will themselves be activated by the same protein as before. In order to explain how the cascade arose, therefore, a scientist has to propose a detailed route whereby a duplicated protein turns into a new step in the cascade, with a new target, and a new activator. Furthermore, because clotting can easily go awry and cause severe problems when it is uncontrolled, a serious model for the evolution of blood clotting has to include quantitative factors, such as how much of a clot forms, what pressure it can resist, how frequent inappropriate clots would be, and many, many more such questions.*
>
> *Professor Doolittle has addressed none of these questions. He has confined his work to the question of what proteins appear to be descended from what other proteins, and is content to wave his hands and assert that, well, those systems must have been put together by natural selection somehow. [...]*

His work concerns sequence comparisons. Doolittle has no idea of whether the clotting cascade could have been built up by natural selection.[76]

Of course, similarities among proteins constitute no evidence for evolution at all. (For more detail on this subject, see, Harun Yahya, *The Evolution Deceit*.) Furthermore, the duplicated gene in Doolittle's claim will be identical to the one before it—in other words it will possess the same components as its predecessor. It is impossible to acquire new features simply by duplication.



In order to account for the present existence of proteins with special duties in the blood-clotting system, this scientist has to explain how a *duplicated* gene came to acquire new and different properties. Yet for Doolittle, with his 35-year career specializing in blood clotting, this remains unanswerable.

Professor Kenneth Miller, a cell biologist from Brown University, falls into the same error as Doolittle. He too has claimed that duplicated genes explain the fictitious evolution of this special system. Miller set this far-from-scientific claim out in a book:

... One of these duplicate genes was then mistargeted to the bloodstream, where its protein product would have remained inactive until exposed to an activating tissue protease—which would happen only when a blood vessel was broken. From that point on, each and every refinement of this mechanism would be favored by natural selection. Where does the many-layered complexity of the system come from? Again, the answer is gene duplication. Once an extra copy of one of the clotting protease genes becomes available, natural selection will favor slight changes that might make it more likely to activate the existing protease. An extra level of control is thereby added, increasing the sensitivity of the cascade.[77]

This account provides no information at all as to how the system in question functions. A scientific response to it comes

When a blood vessel is damaged *(bottom right)*, certain blood cells begin secreting a number of chemical substances *(top right)*, and cause a number of reactions to halt blood flow. One of these reactions forms the protein fibrin, which forms a fibrous mesh to impede the flow of blood *(top left)*.

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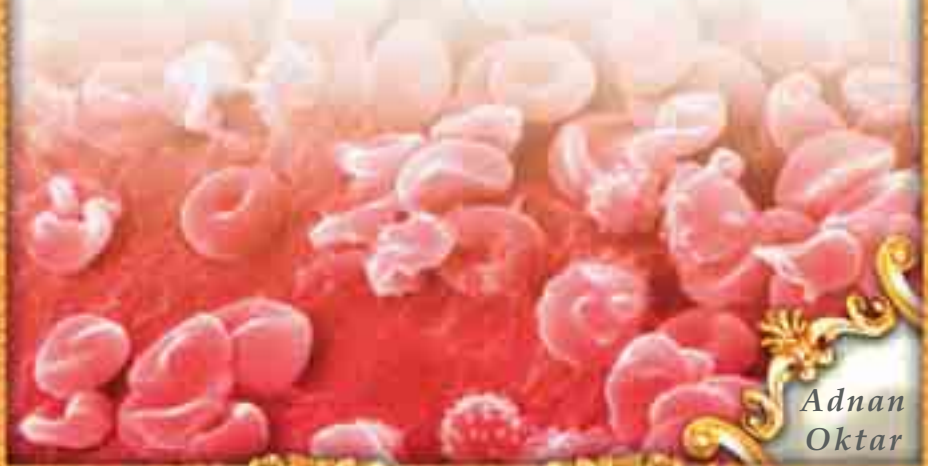
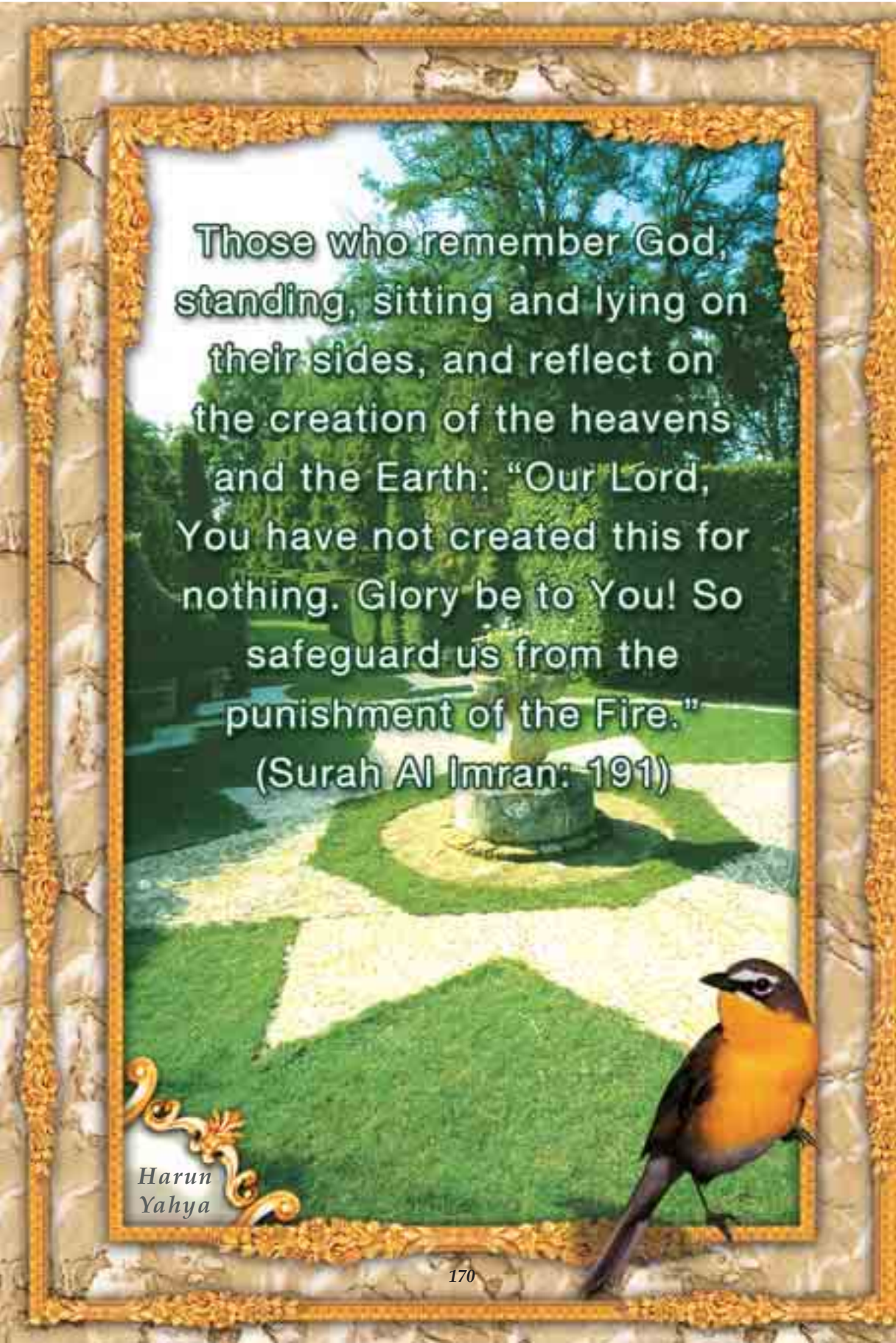
from Michael Behe, who has seen the extraordinary nature of the blood-clotting mechanism and described it in full detail countless times:

> *Professor Miller simply tries to use the term gene duplication as a magic wand to make the problem go away, but the problem does not go away. Miller's assertion that natural selection would favor each additional step is made quite problematic by the fact that each step in clotting has to be strictly regulated or else it is positively dangerous... Miller's statement does not even say what the newly duplicated proteases are envisioned to be acting on—whether the tissue protease, the original mistargeted circulating protease, plasma proteins, or everything at once.*
>
> *Such a brief story is of no use at all in understanding how the irreducible complexity of the clotting cascade could be dealt with by natural selection. It strikes me that the main purpose of the paragraph is not to actually contribute to our understanding of how clotting actually may have arisen, but to persuade those who aren't familiar with biochemical complexity to believe Darwinism has the problem under control. It doesn't.*[78]

As noted by Behe, evolutionists' fictitious accounts, which I have emphasized many times in my other books, may inter-




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: 191)
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est people with only a superficial knowledge of the subject. As studies along these lines increase in number, however, and education levels rise, people are discovering ever more details concerning the magnificent order in the universe, and see the truth of creation in perfect clarity. The traditional methods that evolutionists employ will soon be deprived of their present-day so-called validity.

In the face of all these facts—and despite all the scientific proofs of the extraordinarily complex details in the human body and all living things—evolutionists are still hiding behind each others' explanations and seeking a way out for their theory.

Darwinists are waiting for the emergence of a climate that will bring their claims to the fore and hoping for a *fault* in the sublime order on Earth that will constitute a basis for their claims. As revealed in the verse, however, perfection prevails everywhere they look, for which reason they will never find any deficiency.

Our Almighty Lord, Who has full knowledge of every act of creation, reveals this about those who seek an inconsistency in His creation:

> **He Who created the seven heavens in layers. You will not find any flaw in the creation of the All-Merciful. Look again—do you see any gaps? Then look again and again. Your sight will return to you dazzled and exhausted! (Surat al-Mulk: 3-4)**

IS EVERYONE'S BLOOD THE SAME?

In the first blood transfusion ever performed, the patient was given animal blood. The patient soon died, but nobody could understand why.

When the blood of different animals proved useless, the idea was born of transfusion from human being to human being. Experiments were performed with individuals thought to possess plenty of blood and who were selected at random. Most of these experiments also ended in failure, however. The first physicians engaged in blood transfusions were unable to fully analyze and understand this important fluid, because of two of its properties. One was the way that blood swiftly clots outside the body, and the other was the likelihood of the person to whom they gave the transfusion dying.[79] There had to be some different factor in blood that the physicians were unable to unravel. This factor was not discovered until the appearance of the science of biochemistry.

Not until the early 20th century did scientists discover that blood does not consist of a simple red fluid. Various factors may make one person's blood different to another's. Therefore, in order for blood transfusions to be given, these factors must be compatible in both parties. What we refer to as *blood type* is the determination of these

special factors. There are more than 300 of these factors that determine blood type, each one of which distinguishes you from most other people.

The properties that determine blood type are concealed in the red blood cells. Among the 200 different molecules in the red blood cell membrane, those of perhaps the most interest are the molecules that give the blood its type—A, B or 0. Red blood cells carry either type A or type B molecules, or very occasionally, both together (AB), or none (0).

Red blood cells with type A molecules also contain antibodies against type B molecules. Therefore, when anyone with type A blood is given type B blood, the immune system goes into action within a few seconds and tries to destroy this foreign substance. The consequences are exceedingly severe. Blood cells burst, blood coagulates. The liver and kidneys become unable to function properly. Unless intervention takes place immediately, the result is generally death.

Type 0 people, who have neither molecule in their blood, have developed antibodies against both these molecules. They can receive blood only from people lacking the two molecules—in other words, from people with type 0 blood like themselves. People with both molecules, with type AB blood, on the other hand, have not developed antibodies against either molecules. They can receive blood from either type A or type B individuals.

Another molecule on the red blood cell of just as much importance as these others is the Rhesus (or Rh) factor. If this is in the red blood cells, then the blood type will be Rh-positive (Rh+); otherwise, it will be Rh-negative (Rh-). The major significance of the Rh factor manifests itself in blood incompatibilities during pregnancy. A

Rhesus negative pregnant woman will produce antibodies to the Rhesus positive fetal blood. These antibodies do no harm to the first baby. However, any second baby with the Rhesus factor is subjected to attack by these antibodies, now ready and waiting in the mother's bloodstream. The antibodies target the baby and destroy its fresh erythrocytes. Anemia and heart diseases manifest themselves. The baby may well be stillborn, and even if it is born alive, toxic bilirubin will have formed in its body as a result of the breaking down of its red blood cells. This substance generally damages the brain and gives rise to mental impairments, or even death.[80]

It became possible to understand the nature of blood only in the last century. Yet blood has been flowing in the veins of every human being who has ever lived, discharging its duties and carrying various materials, factors and molecules. That human beings cannot even fully comprehend this miracle should increase their submission to and adoration of God.

God is the Almighty, superior to all things, Who has the power to perform all that He desires. He is the Shaper, the Giver of Form (*Al-Musawwir*). He is the Safeguarder (*Al-Muhaymin*), the Protector. And God is the Supremely Great (*Al-Mutakabbir*), He Who reveals His might in all places and events. We must appreciate Him properly, and see and understand the names of our Lord in the things He has created, and must turn to Him. Those who turn to Him will reap the benefit in this world and in the Hereafter. In one verse God reveals:

> **He is God—there is no god but Him. He is the King, the Most Pure, the Perfect Peace, the Trustworthy, the Safeguarder, the Almighty, the Compeller, the Supremely Great. Glory be to God above all they associate with Him. (Surat al-Hashr: 23)**

It was possible to fully understand the blood and the various factors in it only in the last century. Yet blood has been flowing through our veins and fulfilling its functions ever since human beings were first created. No doubt this is the superior creation of God, Who reveals His greatness and infinite power in all things.

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THE INVISIBLE SOURCE OF CONSCIOUSNESS

As the systems in the human body go about their work, they also assume responsibility for the coordination, order and organization of these tasks. That is why we describe structures in the body as *intelligent* and why we seek to account for the source of that intelligence. No doubt, the term *intelligent cell* or *intelligent organ* is a metaphor, because cells or tissues with no brain or nervous system cannot have their own consciousness. Yet an astonishing consciousness does emerge in everything they do. This represents an insoluble dilemma for Darwinists and all materialists, who maintain that consciousness is born from the cells in the brain and the chemical reactions among those cells. In short, according to the materialist claims, *consciousness consists of the brain.*

Though materialists attempt to reduce consciousness to the brain, scientific observations show that even living things with no brains possess consciousness. The *intelligent cells* examined throughout the course of this book are just one example. In recent years, observations of bacteria and other single-celled organisms have shown that these microscopic entities literally evaluate their surroundings in an exceedingly *intelligent* manner and make appropriate decisions. The molecular biologist Michael Denton writes:

The amoeba, although the size of a small speck of dust, exhibits behavioral strategies which seem objectively indistinguishable from those of animals far higher up the scale. If an amoeba

were the size of a cat, we would probably impute to it the same level of intelligence as we do to a mammal. Just how do such minute organisms integrate all the information necessary to make such apparently calculated intelligent decisions? … the way it [the amoeba] integrates all the information necessary to pursue its prey, its decision to change direction, its persistence in the pursuit when its prey escapes, the sudden breakout of the smaller amoeba from its imprisonment in the interior of its captor at the moment when the wall of protoplasm was at its thinnest—all this remains to be fully explained in molecular terms.[81]

The final sentence of the above account is particularly notable. Amoebas' behavior cannot be explained at the molecular level, in terms of chemical reactions and physical effects. These living things decide and act as conscious entities, even though they possess neither brain nor nervous system. They are merely cells consisting of protein, fat and water.

A nerve cell in the body acts with amazing intelligence. However, to call a nerve cell *intelligent* doesn't imply that it possesses the intelligence. The reason of the amazing consciousness in body cells is the inspiration they take from God.

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There are other examples revealing the intelligent behavior of bacteria.

According to a report in the July, 1999, edition of the French scientific journal *Science et Vie* ["Science and Life"], bacteria communicate with one another and make decisions based on those communications.

Science et Vie emphasizes that this communication takes place by means of a very complex system. On their surfaces, bacteria have mechanisms that emit and receive electrical signals. In this way, they send one another signals, and transmit information about the features of their environment and the food situation therein. On the basis of that information, they then decide whether to multiply and when to stop doing so.

In short, tiny living things too small to be seen with the naked eye, collect information about their surroundings, transmit this information to one other, and later still—as a group—determine a particular course of action.

All these examples show the presence of a consciousness that can never be reduced to matter. From human beings, regarded as the most complex living things, to single-celled creatures, regarded as the simplest, there is an astonishing consciousness that reaches far beyond mere matter.

So what is its source?

The Qur'an provides important information on this subject. For example, its verses referring to honeybees reveal that the conscious behavior exhibited by these creatures is inspired in them by God:

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)

Another verse reports that all living things are under the dominion of God. As revealed in the Qur'an, **"There is no creature He does not hold by the forelock"** (Surah Hud: 56).

This secret revealed in the Qur'an is the source of the mysterious consciousness in living things. Contrary to what evolutionists imagine, consciousness is not a property of matter. No matter what you do to the atoms comprising matter, you can never cause them to have consciousness. Consciousness must arise from another consciousness; and the consciousness in living things stems from the inspiration of God.

The intelligence that appears in the cells in the human body or of any organism is a manifestation of God's absolute dominion over living things. God reveals Himself by means of the entities He creates, and human beings can witness and appreciate His infinite power and might by considering these works. In listing the examples of consciousness in this book, therefore, this important fact needs to be borne constantly in mind.

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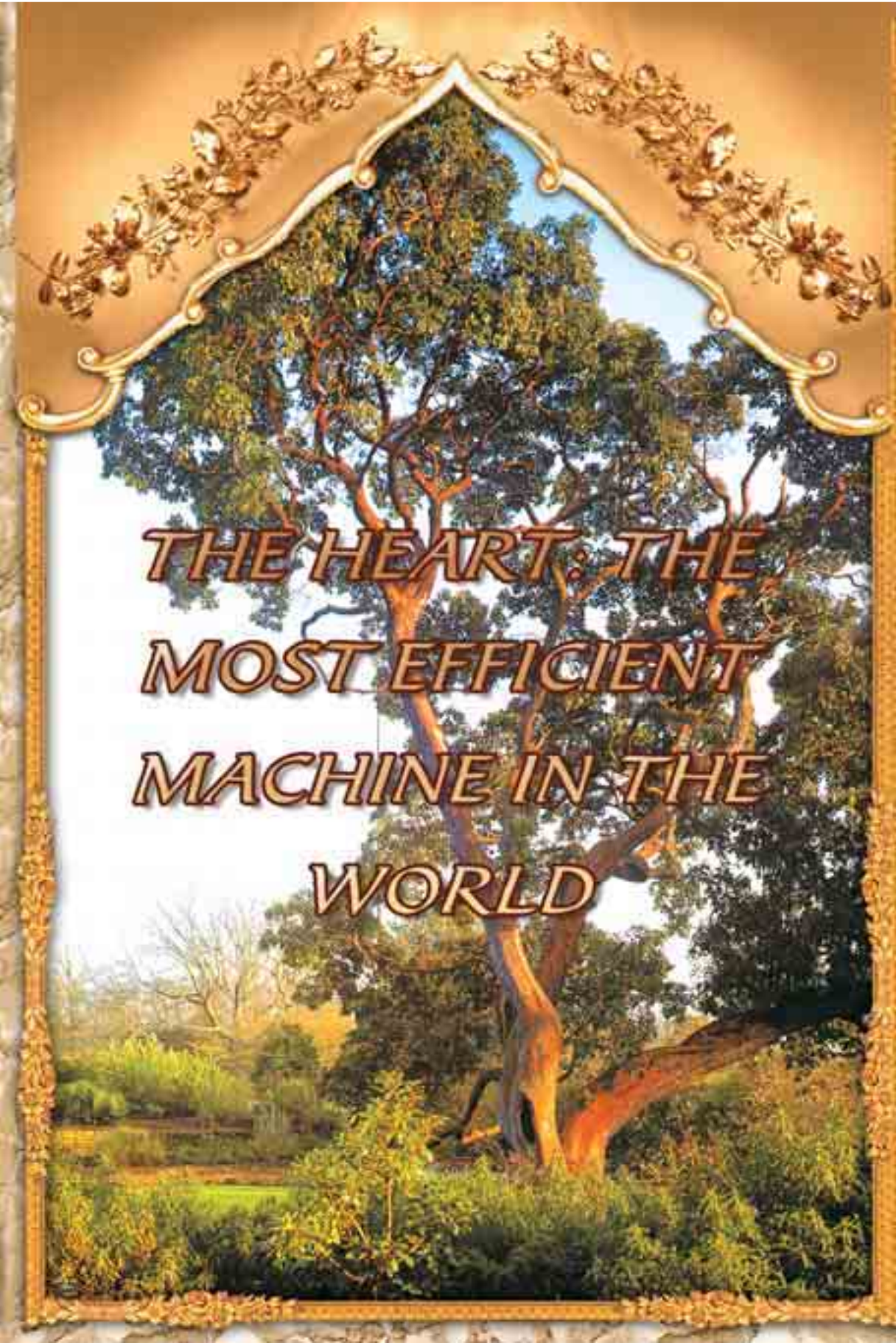
THE HEART: THE MOST EFFICIENT MACHINE IN THE WORLD

Recall the small accumulation of cells that starts moving on the left side of the 22-day-old fetus. That first movement signals a heartbeat. This collection of cells will now not stop moving for a long time. It will never grow tired. It will beat around 70 times a minute, some 35 million times a year, and some 2 trillion times during an average lifespan.[82] It will pump a total of some 227 million liters (59,970,000 gallons) of blood throughout its owner's life.[83]

This astonishing amount could fill a 10-ton tanker[84] in a day, or 100 full-capacity swimming pools in a lifetime.[85] And this extraordinary pump seldom misses a beat from its rhythm, and never goes wrong and becomes old. It never loses its ability to pump blood throughout the body until the death of its owner. That is because this is an extraordinary miracle of God, Who is able to create a superior artistry, flawlessness, an incomparable balance and magnificent intelligence all at once.

The fetus's heart begins beating hours before there is any blood to pump. But why should this organ start functioning before the blood is formed? The reason is the need for nutrients. The emerging embryo requires nutrients, oxygen and hormones in order to develop. In the tiny embryo, there are also waste products that have to be carried away. Therefore, this magnificent pump inspired by God suddenly begins its independent and flawless motion at just the right time and place.[86]

Every detail in this great miracle is sufficient for

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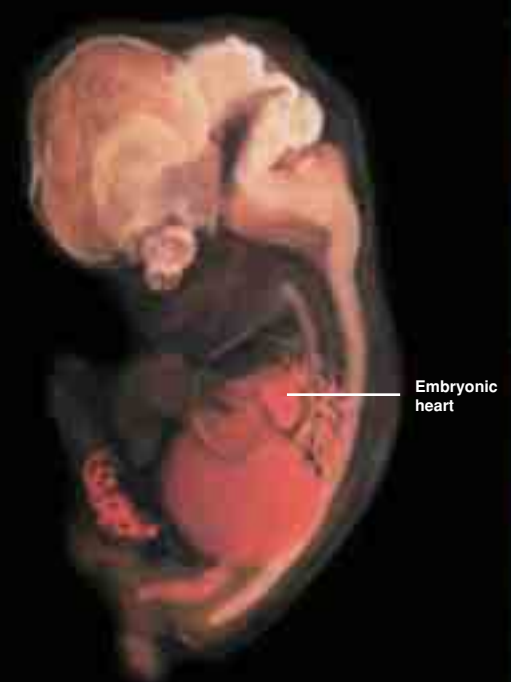
a person to have faith and see the evident proofs of God's existence. A most special creation prevails in all the features of the heart. Independently of all the other miraculous systems in the body, the heart is by itself a major example of creation in our bodies. No comparable mechanism to keep a human being alive has ever been developed. With the cells that comprise it, its special valve systems and the ordered way these open and close, the heart is a most complex system with many attributes. No other organ can do anything like the job it does—to keep pumping blood in a particularly powerful way. As long

The embryonic heart begins developing from the third week of pregnancy, and works as a single pump for the embryo's blood, which circulates only in the baby's body and the placenta. After birth, however, since oxygen is inhaled directly by means of respiration, the embryonic heart needs to possess four chambers. This physiological dichotomy has been resolved thus: Two holes in the chambers of the heart enable blood to be retained in these chambers and the as-yet-undeveloped pulmonary veins are protected. When the baby takes its first breath and begins crying, these holes automatically close and cease their function. This marvel of creation once again shows to us the flawlessness of our Lord's creation.



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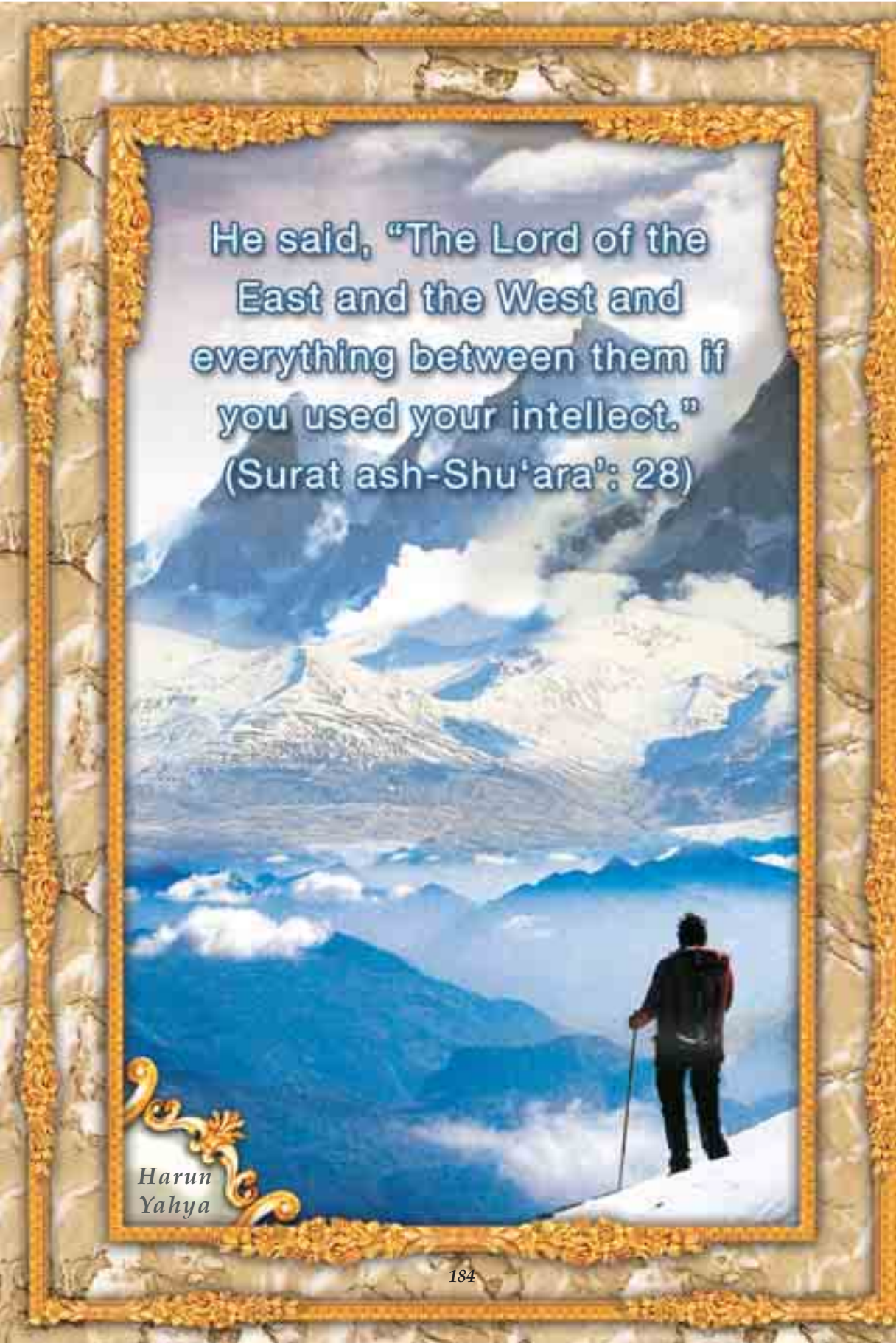
as blood is still present, the heart can even keep beating outside the body.

By beating an average of 70 times a minute, the heart moves blood around the body some 1,000 times a day. This means that blood visits every cell in the body 1,000 times a day, carries to them the necessary nutrients, gives oxygen and takes back carbon dioxide, repairs damage, makes good defects and collects wastes. Thanks to the heart's tireless efforts, every cell in the body is "inspected" 1,000 times a day. The heart pumps 8,000 liters (2,113 gallons) of blood every day.[87] The heart of an adult pumps 340 liters (89 gallons) of blood an hour even while sleeping. At that same rate, one could easily fill a car's gas tank in just seven minutes.[88]

The heart is a piece of muscle the size of a fist, consisting of water, fat and protein, but possessing a far more perfect and complex system than even the most advanced pump that has yet been developed by experts working with computers. This incomparable piece of flesh is powerful enough to squirt blood 2 meters (6 feet) high into the air.[89]

Another miraculous feature is that the heart can determine the body's needs and pump just as much blood as it requires. In a person at rest, the heart pumps just 4 to 6 liters (1.057 to 1.585 gallons) of blood a minute. That quantity is enough because the resting body's cells don't require too much oxygen. If someone is exercising, however, his need for oxygen rises, and it needs to be transmitted to the cells faster. The heart immediately identifies this need and begins beating faster. During exercise, the amount of blood pumped by the heart can increase by four and seven times.[90]

To see the perfection of these features of the heart, imagine a machine that pumps water at least


He said, "The Lord of the East and the West and everything between them if you used your intellect."
(Surat ash-Shu'ara': 28)
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once in a second, on an average of 65 to 70 times a minute. Let that water be carried to *a hundred trillion* homes every second by means of that pump, under the same pressure. At the same time, let that plant determine how much water each house needs and send the requisite amount to each one. In addition, make this system be able to function for at least 70 years, never develop the slightest defect, never rust, and never neglect a single pipeline leading to any of the homes in question.

How could such a system be brought into being? It is impossible to meet the needs of 100 trillion houses under the same pressure at the same time. A machine that works at such high speed and to such an unchanging rhythm cannot last any longer than 10 or 15 years. Even before then, it will have to undergo maintenance many times to make good any defects. It is impossible for such a machine to function for long years without any mistakes. It is totally illogical to claim that an ordinary piece of equipment can determine needs in houses, evaluate the situation and send the right amount of water where required.

In addition, recall that this pump you have established is under your control or that of another rational being like you. Naturally, you cannot claim that such a mechanism and its pipelines came into being by themselves over the course of thousands of years by the coming together of iron and cement, then suddenly began rhythmically pumping water, through pipelines, laid by themselves, that will reach to 100 trillion houses. Not one person would believe it. It is obvious that the system was brought into being by an intelligent being.

However, evolutionists manage to claim that such systems as the circulatory and respiratory—

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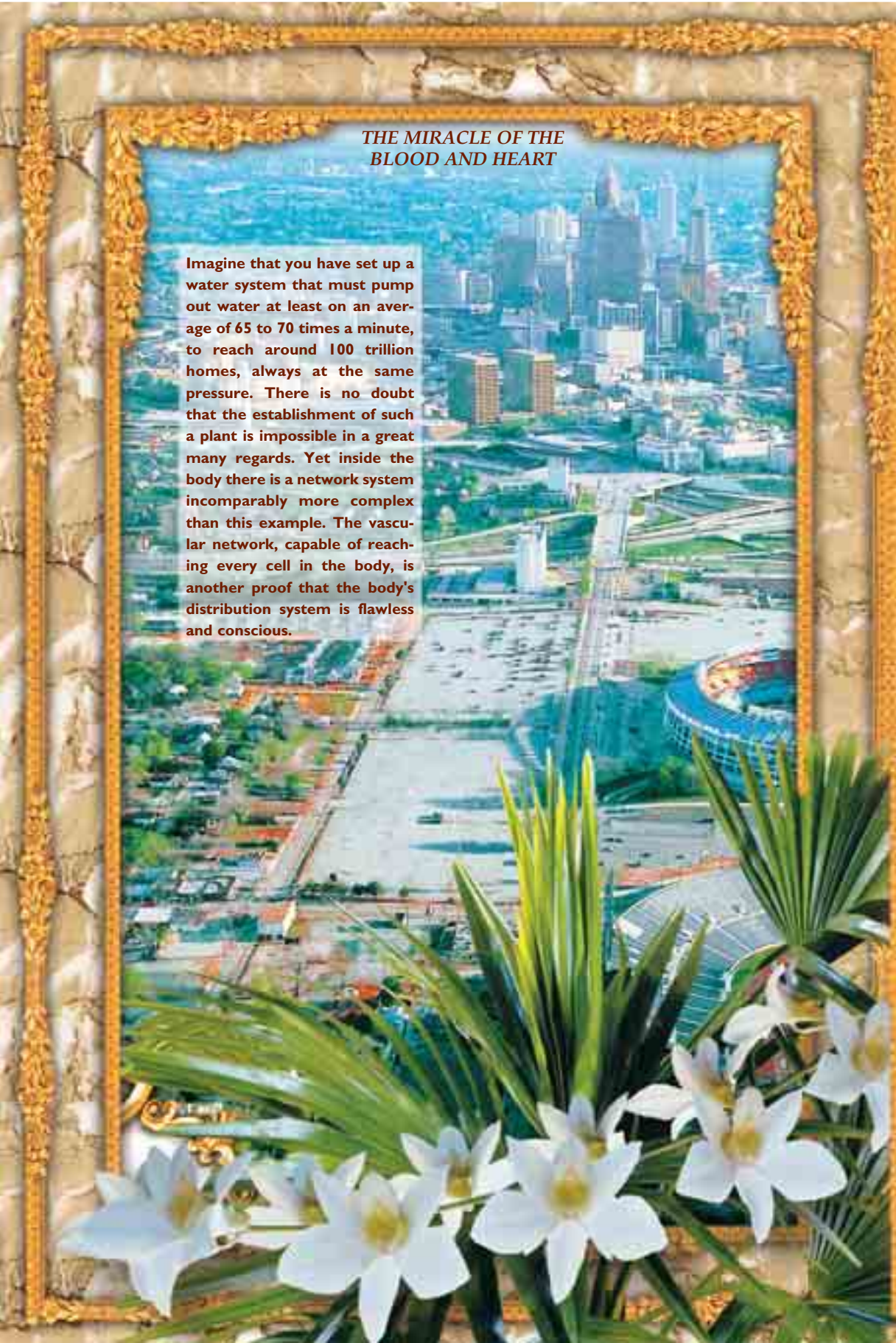
THE MIRACLE OF THE BLOOD AND HEART



Imagine that you have set up a water system that must pump out water at least on an average of 65 to 70 times a minute, to reach around 100 trillion homes, always at the same pressure. There is no doubt that the establishment of such a plant is impossible in a great many regards. Yet inside the body there is a network system incomparably more complex than this example. The vascular network, capable of reaching every cell in the body, is another proof that the body's distribution system is flawless and conscious.

incomparably more perfect than any artificial ones—came into being as the result of blind chance. They maintain that this magnificent pump, which began its work while you were still in your mother's womb, began functioning in an uncontrolled manner, as the result of chance. They ignore the clear existence of the Almighty Force to which this matchless work belongs. Yet as we shall soon examine in detail, every feature of this miraculous organ introduces us to the superior wisdom and power of God. It is revealed in verses that:

> **Does man reckon he will be left to go on unchecked? Was he not a drop of ejaculated sperm, then a blood-clot which He created and shaped, making from it both sexes, male and female? Is He Who does this not able to bring the dead to life? (Surat al-Qiyama: 36-40)**

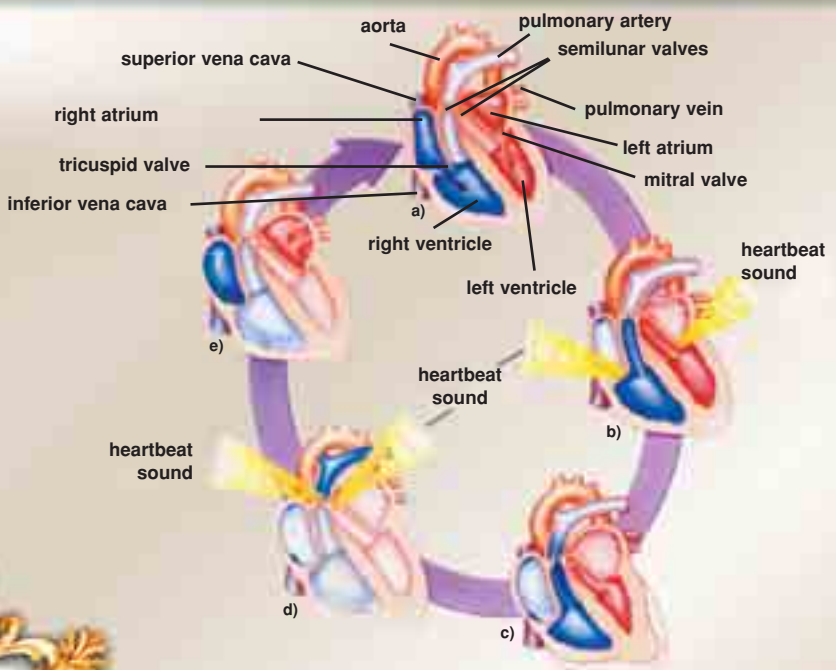
The Heart's Working Mechanism

The heart possesses a most systematic system, in which a single flaw can spell the end of an individual's life. The most important of the heart's mechanisms are the pumping muscles on its right and left sides: There are atria (small pumps) and ventricles (large ones) on both sides of the heart. The heart's left side—the left atrium and ventricle—is responsible for distributing oxygenated blood to the organs and tissues. The heart's right side—its right atrium and ventricle—serves to pump the "dirty" oxygen-depleted blood to the lungs to be cleaned.

When oxygenated blood reaches the heart, it is received by the left atrium, the small upper cavity. From there it is passed to the left ventricle, the large chamber below. In a similar way, deoxygenated

blood is transmitted from the right atrium to the right ventricle. Although the chambers in the heart appear different, they actually perform the same job. Both are charged with pumping the blood to a specific objective.

The systematic functioning of this mechanism is of great importance because all these processes have to be in order. And if it goes wrong, the heart will either pump no blood to the body, or else it will become loaded with too much blood. In order for this sequence to occur properly, the valves between the atrium and the ventricle open like a one-way gate to the flow of blood. When the atria contract, these valves open and blood enters the ventricles. After this has taken



Arrow indicates the direction of the blood flow. When the heart contracts, blood is passed from the atria to the ventricles. The valves close. As the ventricles contract, blood is pushed out to the body.

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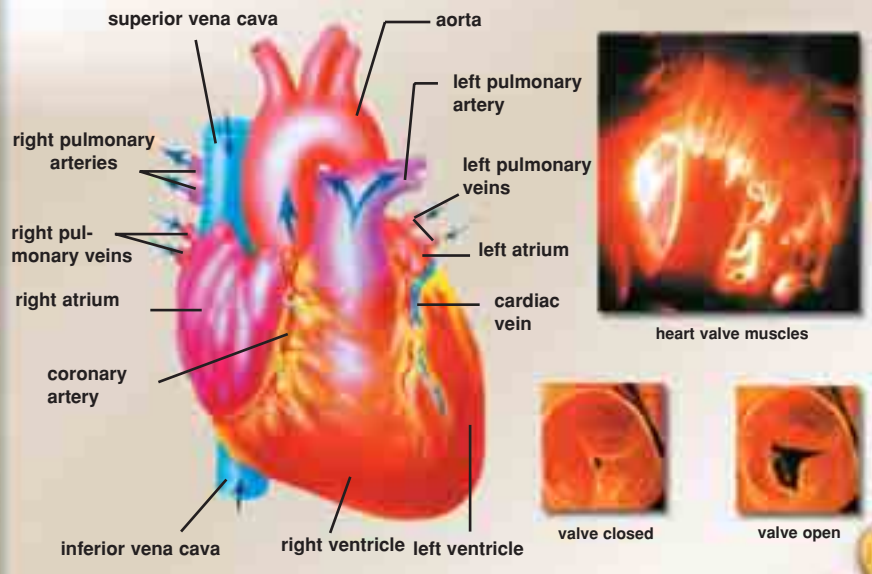
place, the valves close again to prevent the blood's return to the atria where it came from.

Similar valves also exist in the ventricles. When the ventricles contract, these valves open and let the blood flow directly to the body. Then the valves close, preventing the pumped blood from returning to the heart. The sound that you perceive as your *heartbeat* does not result from the heart's contraction and dilation, as is popularly imagined. Listening to your heartbeat, you are actually hearing the opening and closing of these four powerful valves.

Leaving aside this flawless system's enormous complexity, even just the rhythmic opening and closing of the valves pre-



The venae cavae bring deoxygenated blood to the right side of the heart, and the pulmonary arteries carry that blood to the lungs. The pulmonary veins bring oxygenated blood from the lungs to the left side of the heart, and the aorta sends this blood to the body. During this flow of blood, the heart valves contract, thus allowing blood to pass through the chambers.

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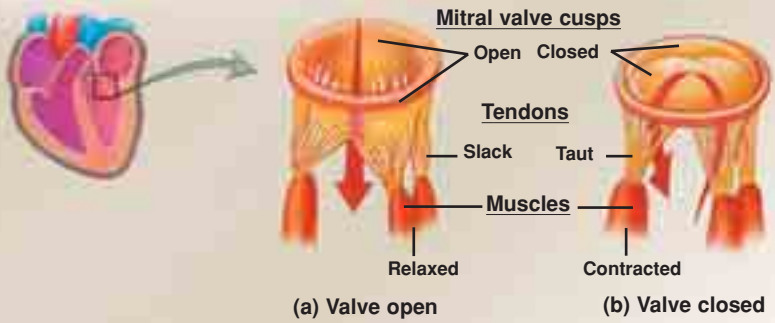
The heart valves open in the direction of blood flow. When the atria contract, these valves (atrioventricular valves) open and blood fills the ventricles. The valves then immediately close again to prevent any blood from flowing back where it came from.



sents evolutionists with an enormous quandary. No living thing can afford to wait to come into possession of such a rhythmic order. The slightest lapse will cause terrible damage. The rhythmic opening and closing of the valves has to function splendidly even while the creature is still in the embryo phase. To maintain that such a movement came about through random mutations and functions in perfect manner in all vertebrates as the result of chance is a falsehood that no logical person can accept.

The Heart Muscle Cells: the Only Ones Moving Rhythmically in the Body

The body consists of some 100 trillion cells, each with different functions and properties. Some, like the red blood cells, possess no nucleus. Others, like those in the windpipe, have minute hairs. Some have

propulsive structures that allow them to move. Yet heart muscle cells possess an ability not found in any other in the body—the ability to *shrink and expand*, which is why the heart, which is made up of such cells, *beats.*

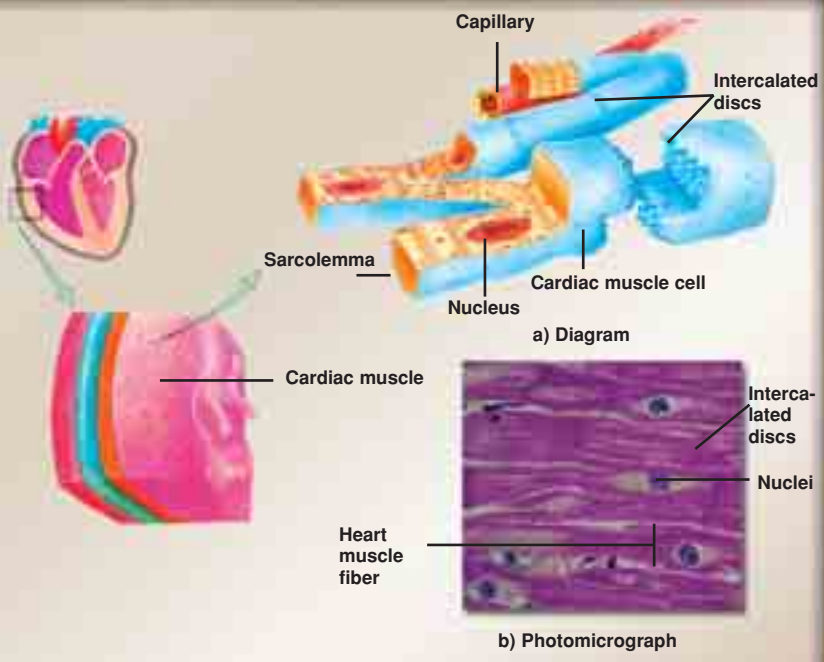
What makes the muscle cells in the heart special is the way they suddenly begin moving inside the still-developing embryo. These cells continue *beating* during transplant surgery, despite all the nerves connected to them having been severed and all contact with the organs around them having been eliminated. Indeed, even when you separate just one of these cells and place it under a microscope, it will continue to pulsate as long as you nourish it with blood.[91] Despite appearing to be outside the control of any mechanism, these cells behave as if they had literally taken a decision to beat, pump blood and keep their body alive.

What allows them to beat is the electrical current that passes over them. Every cell making up the heart is literally a living battery. They themselves chemically produce the energy that powers the movement we refer to as the heartbeat. This feature of the cells is too extraordinary to be explained with any evolutionist claim. Cardiac cells provide the necessary electricity for themselves with the potassium and sodium ions that they can easily find in the blood. Each of the atoms comprising these two elements frequently loses a negatively charged electron. Consequently the atom has an extra proton, or a positive charge.

Cardiac cells possess a high concentration of potassium ions, and sodium is present in the fluid surrounding these cells. The cell membrane removes sodium from the heart muscles and takes potassium inside. Since

the cell membrane removes sodium faster than it takes in potassium, an excess positive charge builds outside the cell. When it reaches a certain level, the flow suddenly reverses and sodium ions again begin entering the cells. This sudden change sets up an electrical current, and the heart cell retreats by contracting.[92] The process that allows the cells to beat emerges through these chemical transactions.

The signal for the heartbeat to start depends on one small knot of cells known as the sinus node, or SA node, in the right atrium. The electrical signal produced by this node is trans-



The cardiac muscle possesses a very special structure, in that every one of the cells comprising it can beat on its own. These cells are just like living batteries, using the electrical current that passes over them.

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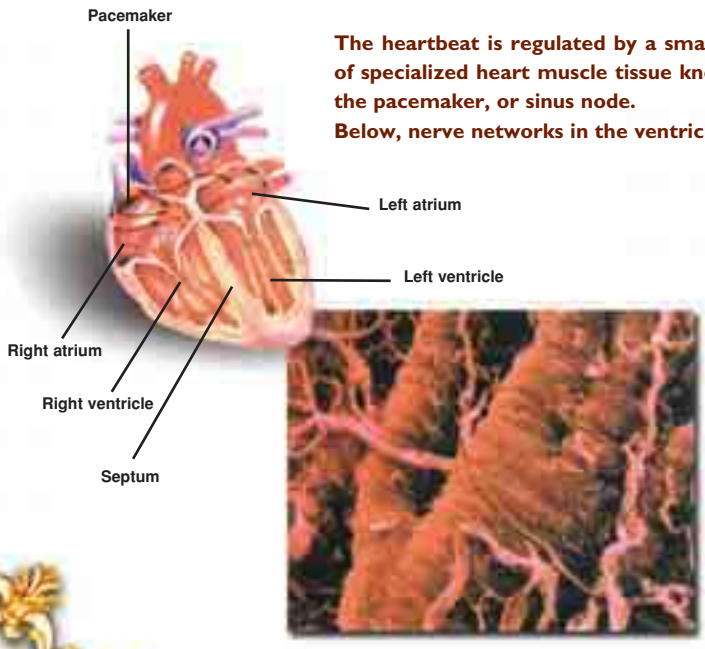
mitted to the heart muscle by two small muscles. The cells pass on the electrical impulse reaching them to all the other muscle cells in the heart's lower regions. This wave of current stimulates all the muscle cells beneath, starting with the right atrium, and is thus disseminated throughout the heart. The sinus node, producing and regulating these electrical currents, is also known as the pacemaker. While controlling the rhythm, the pacemaker also reacts to the needs of the body. It possesses the ability to accelerate or decelerate the heartbeat according to the body's requirements.

The heart does not contract all at once, however, because it has to collect blood and also to pump the blood it has collected. If all cardiac cells were to contract at once, then the blood would be pumped before it had been properly collected; and as a result, only a few drops of blood could be transmitted to the body. However the blood collected by the atria must be transmitted to the ventricles, which are larger, before the latter contract. Therefore, the cardiac muscles wait for each other to contract in sequence, just as if they were aware of their own place in line. As the cardiac muscle tissue of the atrium contracts, the valve separating the atrium from the ventricle opens and allows the blood to flow downward into the ventricle. Once the ventricle is full, it contracts. But how does that sequencing manage to remain so regular?

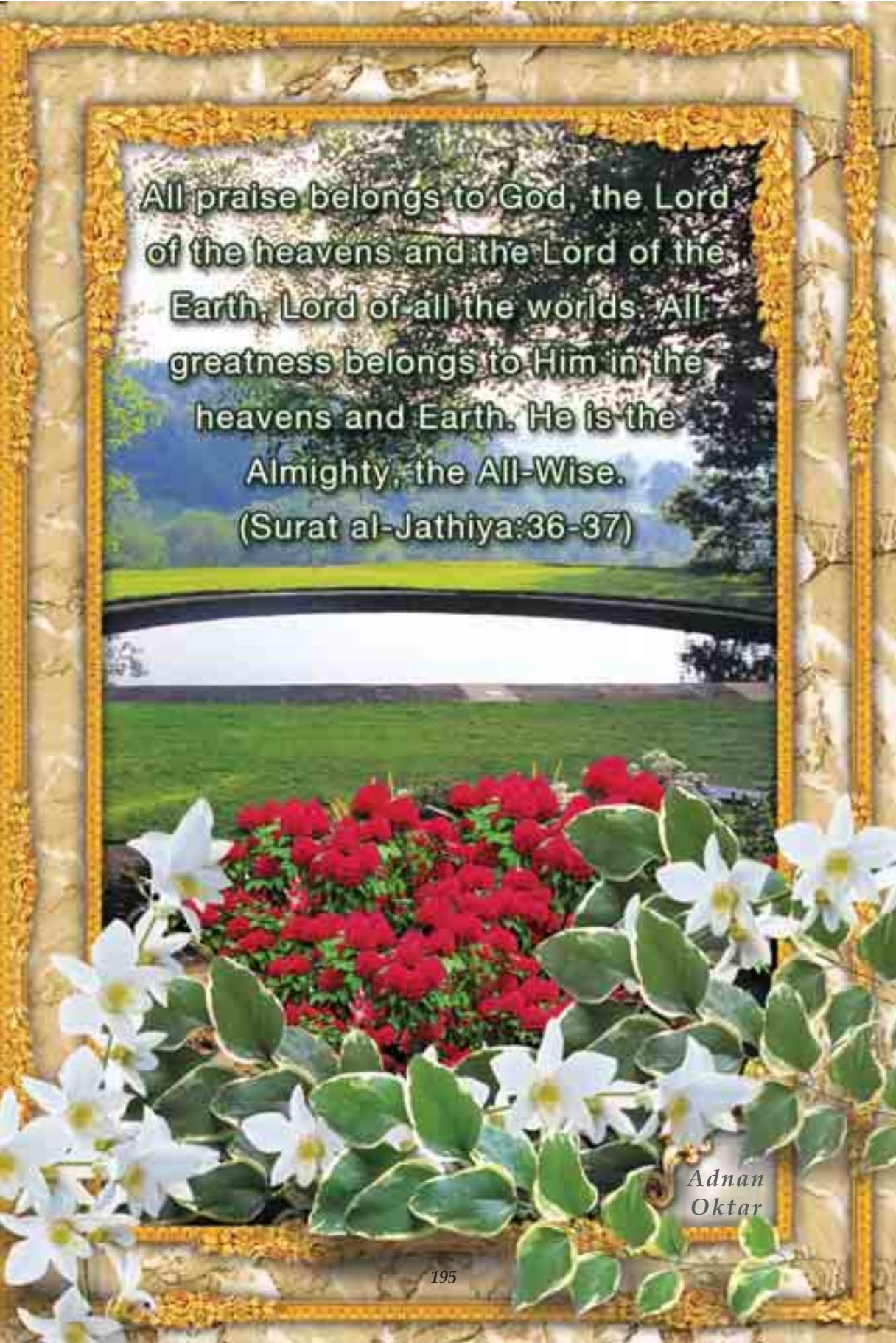
If you examined the cardiac cells under a microscope, one by one, you would see that each one beats at a different rate. This is a most astonishing, but also a most miraculous state of affairs: Far from being a sign of any irregularity, this actually indicates an impeccable order. The heart beats in a rhythmic and synchronized way: The cells literally *know* when to contract and when to

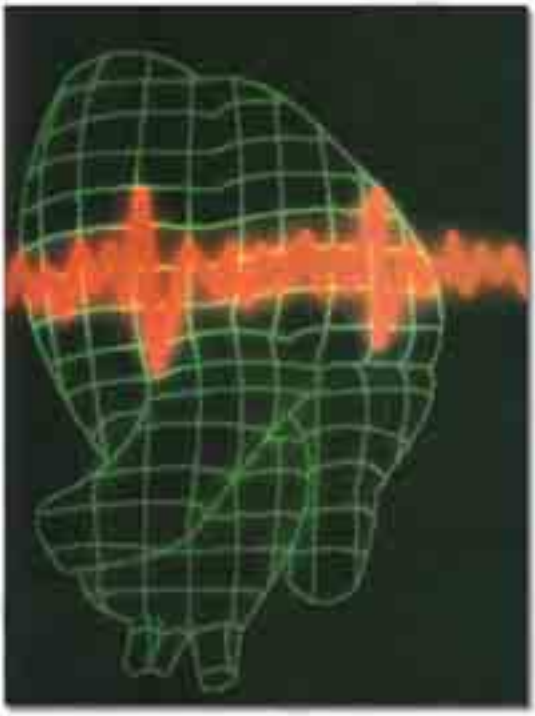
expand, in line with this synchronization. God has inspired in each cell the time frame in which it will beat. That's why each beats at different speeds and sequences.[93]

When you put together two cardiac cells that beat at different rates, they immediately begin beating in rhythmic harmony through an extraordinary mechanism. When these intelligent cells come together, they all work in harmony and maintain a rhythm that will best pump the blood. This extraordinary fact is one of the blessings created by God for humanity. The flawless harmony between the cells is one of the proofs of our Lord's artistry. God is the Ruler of all, the Almighty.



**The heartbeat is regulated by a small body of specialized heart muscle tissue known as the pacemaker, or sinus node.
Below, nerve networks in the ventricle.**


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-Jathiya:36-37)
Adnan Oktar



A cardiogram indicating the heart's electrical activity. The heart beats rhythmically and synchronically. Thanks to this regular rhythm the body is provided with the appropriate amount of blood flow.

The Heart Cells' Timing

The impeccable order in the timing of the heart is brought about by coordination and communication among the cells that comprise it. Here again, of course, a striking *intelligence* manifests itself. These intelligent cells transmit current to the other side of the heart at a speed of approximately 60 centimeters (23.62 inches) a second. The signal is sent from the sinus node. The cells comprising the sinus node produce the signal in $1/14^{th}$ of a second.

As the current moves rapidly, it passes through the two atria in turn and causes them to contract.

Between the atria and ventricles of the heart, there is an area of specialized tissue, known as the AV node (atrioventricular node), that conducts the electrical impulse from the atria to the ventricles. Just as the electrical impulse is about to reach the ventricles, it is delayed by the AV node. The speed of the current falls to 20 centimeters (7.84 inches) a second and it starts being transmitted at around 1/16th of a second.

This delay is of the greatest importance. Due to that delay, before the ventricles contract, the atria are empty completely.[94] This is the secret of the heart's synchronized action.

These are not the only notable details in the heart's electrical system. One miraculous feature of this system is the sinus node that initiates the first current. In fact, the other regions of the heart possess the same ability as the sinus node, which sets the heart muscles in motion. The AV node and the Purkinje fibers, located in the inner ventricular walls, can also set the heart in motion by setting up such a current. So why is this task left solely to the sinus node? Because the current transmitted with the sinus node is significantly faster than the others. The sinus node stimulates tissues that could set up signals of their own before these signals even begin.

Because of that speed, the sinus node initiates all electrical activity. If the current were initiated at other nodes, it would lead to blood failing to reach, or being delayed in reaching, various organs.[95] The consequences would be most serious. Indeed, if blood fails to reach the brain within 4 to 5 seconds, the individual will lose consciousness. If that lack of blood is prolonged still further, it will lead to death.

Considering all these features, you can see that the

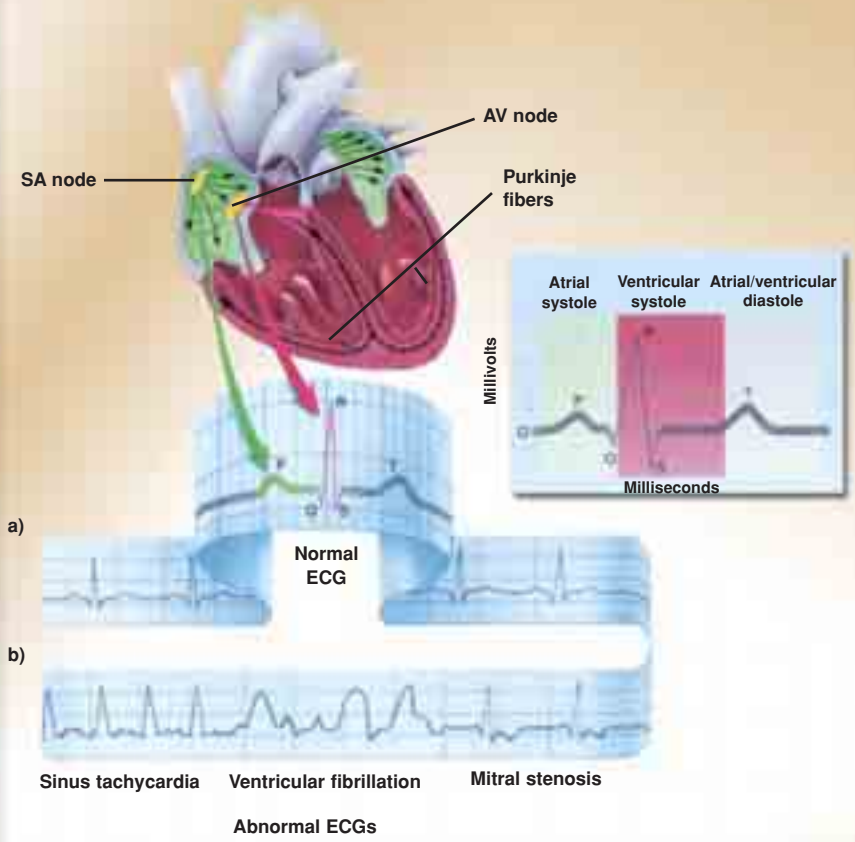
heart is a conscious organ that produces its own energy and employs it to work in a most synchronized, harmonious manner. The place where movement begins is a small node consisting of a specific quantity of cells that knows how fast it has to transmit the current. Otherwise, the heart would be unable to fulfill its function and pump blood. At the same time, the heart accurately determines the amount of the current it produces. If an immeasurably minute amount of current passes through this region in an uncontrolled manner, this will cause problems that could result in death.[96]

In addition, the heart is able to regulate its own synchronization. Whichever of the cardiac cells, aligned side by side, has the fastest rhythm of expansion and contraction, it keeps the others in synchronization. If this rhythm is impaired—if one cell expands while another contracts—then the necessary pumping will fail to take place. The heart will soon stop and death will follow in a matter of minutes.[97]

In short, the heart consists of special cells that constantly produce energy, coordinate the blood flow, expand and contract under the inspiration they receive from God. They can regulate their own order, act with intelligence and can plan, calculate, and move quickly to take precautionary measures.

The Special Network that Feeds the Heart

The heart nourishes the entire body, but like all other organs, it too needs to be nourished. Because of the intensity of its work and the fact it is such a very special organ, the heart requires large quantities of oxygen and nutrients. However, the heart muscle is too thick to absorb and benefit from food and oxygen in the blood filling



a) The sinus node (SA node) sends out a signal that causes the atria to contract. When this signal reaches the AV node, it sends a signal to the ventricles to contract by way of the Purkinje fibers.

b) A normal ECG shows the heart is working properly. The P wave forms when the atria contract, the QRS wave when the ventricles contract, and the T wave when the ventricles are recovering from contraction.

c) Abnormal ECGs: Sinus tachycardia is a rapid heartbeat due to a fast pacemaker. An irregular heartbeat occurs because of the ventricles' irregular stimulation (ventricular fibrillation). Mitral stenosis occurs because the mitral valve is obstructed.

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its chambers. Therefore, how is this valuable organ nourished?

In addition to all the marvels of creation examined so far, the heart is also nourished by a special system that feeds it, known as the *coronary circulation.*

Of the blood that emerges from the heart by way of the coronary arteries, the heart itself is the first recipient. These arteries are two separate branches of the aorta carrying oxygen-rich blood from the lungs. These arteries have been created solely to feed the heart. Unlike all the other arteries, they leave the heart but then return to it, rather than going to other organs. In this way, the blood richest in oxygen is devoted to nourishing the heart, that region of the body needing the greatest amount of oxygen, without being diverted anywhere else. Since the heart's cells must turn oxygen and sugar into energy in order to be able to function, blood in the coronary arteries needs to be rich in these substances—because the heart's energy consumption is regulated according to need, and can raise four- or five-fold in a matter of seconds.[98]

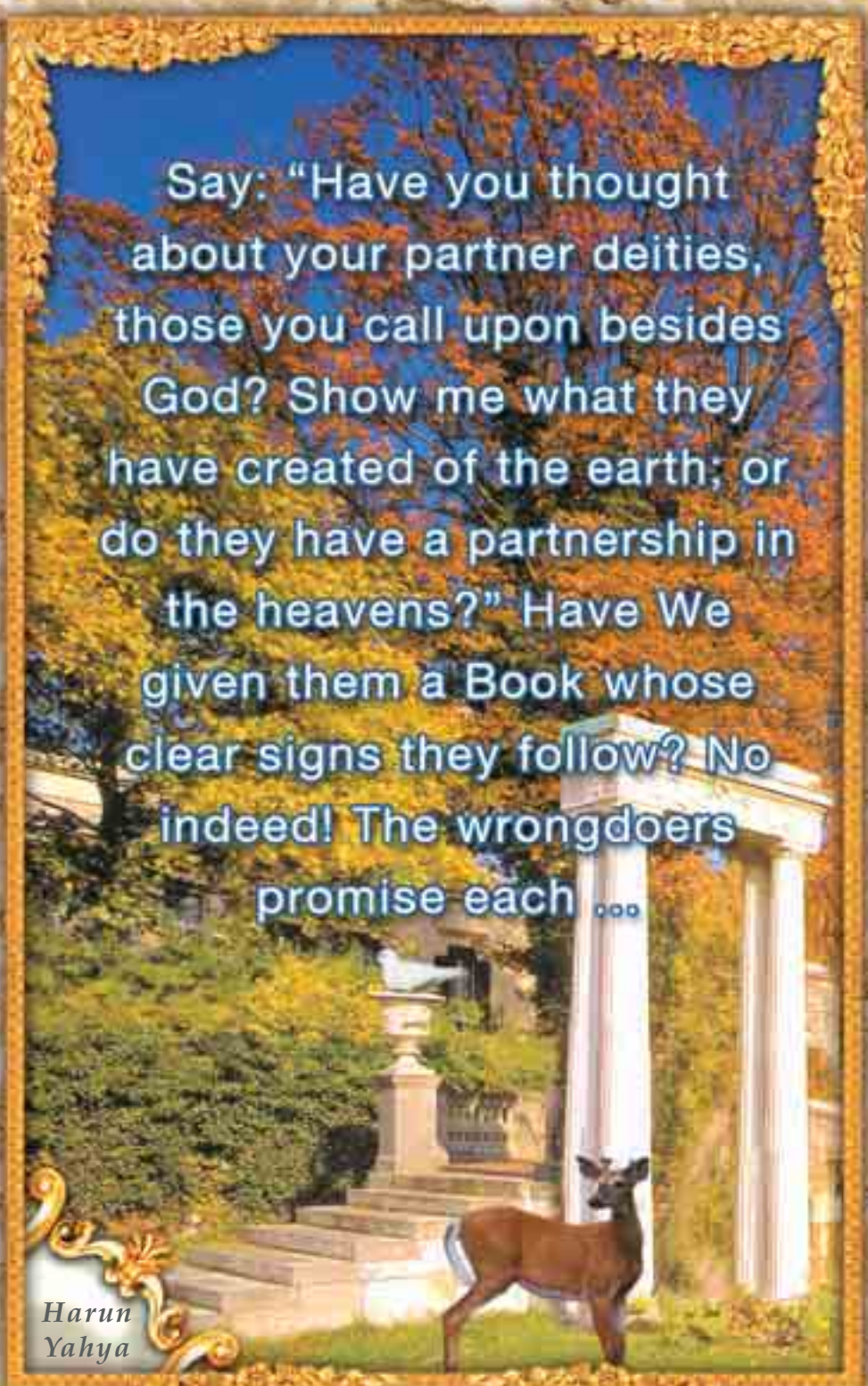
The coronary arteries are perfectly equipped for their job. These arteries entering the heart separate into much smaller branches and spread throughout the heart muscle. Every cell making up the heart has a constant need for nutrients and oxygen. As these arteries head directly for the heart, they also establish sub-connections with one another, because if any of the arteries is blocked for any reason, the heart muscle will receive no nourishment and will die. These sub-connections represent a precaution taken in the face of that very grave danger. If one artery becomes blocked, thanks

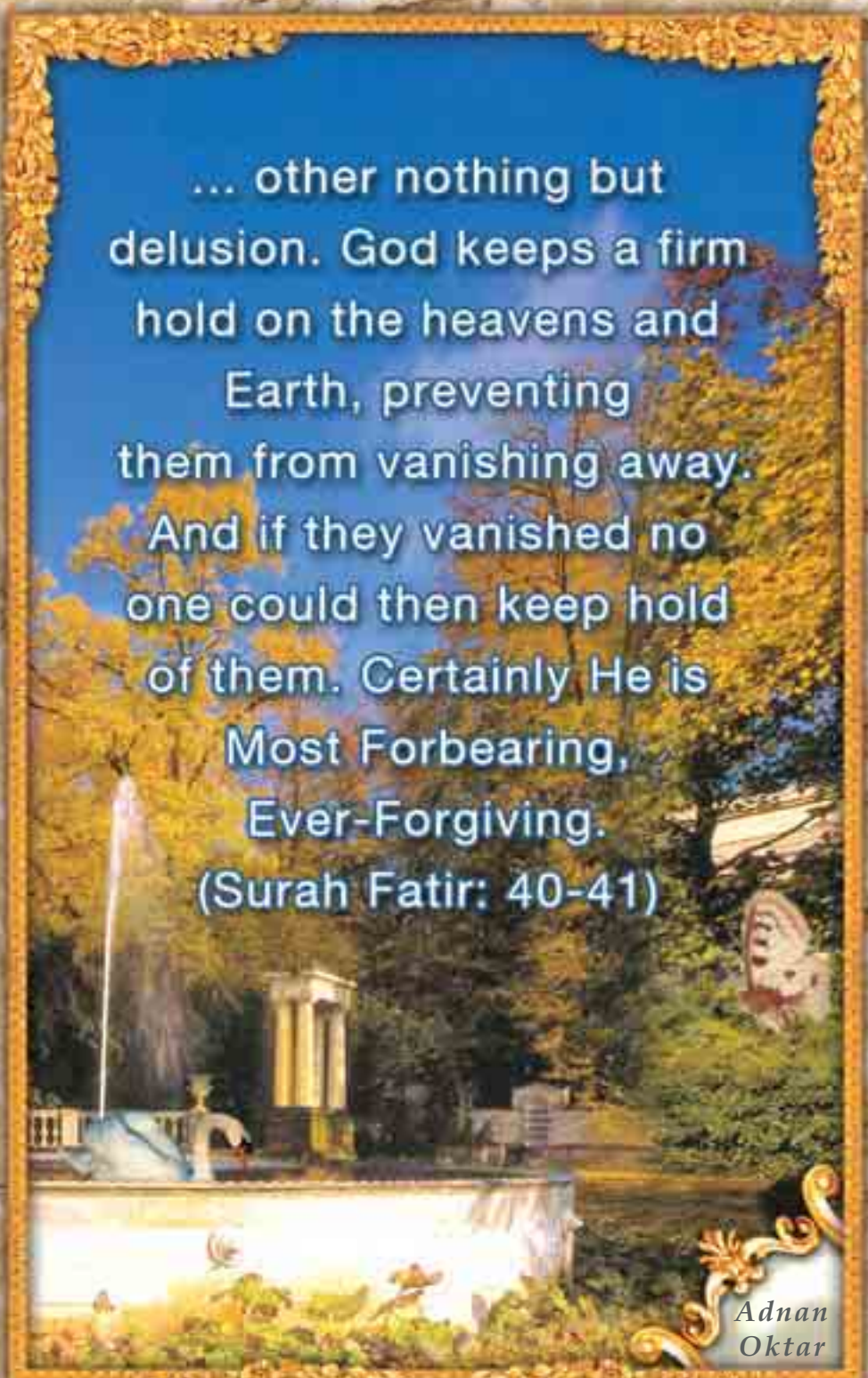
to that precautionary measure, blood will still flow through the others, bypass the obstruction and eventually reach the muscle tissue.

Could coincidences have taken it upon themselves to take such a precaution, before that danger was even present, by *imagining* the arteries becoming blocked? This is of course impossible. Coincidences are random accidents that leave no room for conscious intervention. This order, present in all living things including human beings, belongs to God, Who created them.

God reveals this in a verse of the Qur'an:

Glorify the Name of your Lord, the Most High. He Who created and molded; He Who determined and guided. (Surat al-A'la: 1-3)


Say: "Have you thought about your partner deities, those you call upon besides God? Show me what they have created of the earth; or do they have a partnership in the heavens?" Have We given them a Book whose clear signs they follow? No indeed! The wrongdoers promise each ...
Harun Yahya


... other nothing but
delusion. God keeps a firm
hold on the heavens and
Earth, preventing
them from vanishing away.
And if they vanished no
one could then keep hold
of them. Certainly He is
Most Forbearing,
Ever-Forgiving.
(Surah Fatir: 40-41)
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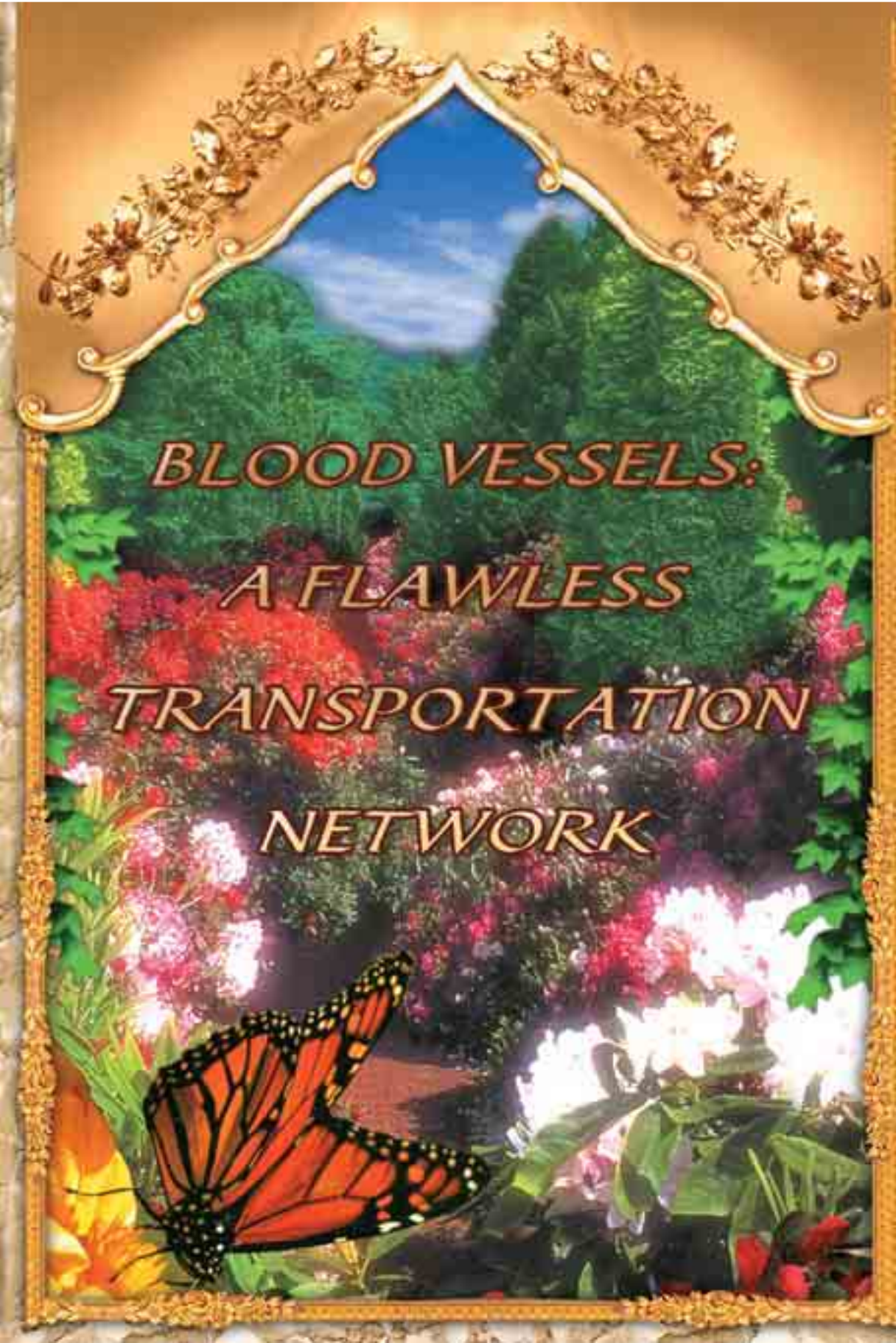
BLOOD VESSELS:
A FLAWLESS
TRANSPORTATION
NETWORK

Imagine that you have installed 100 trillion houses over a wide area and that—as in our earlier analogy—you had set up a water facility among them. No doubt this task would be very laborious and difficult. But assuming that you have been successful, still you will need a very large area for the network of pipes. Would you be able to install such pipelines in miniature form in an area the size of the human body?

To pose this question another way, could you set out a network approximately 100,000 kilometers (some 60,000 miles) long, in the most appropriate manner, in such an economical way as to fit in the human body, and so the network could link to every one of our 100 trillion cells? It would be impossible! A circulatory system such as you could never produce has already been formed inside your body. It was created for you before you even entered the world, giving life to all your cells. This is one of the most important proofs that you have another perfect marvel of creation in your body. The human circulatory system possesses such a miraculous organization that it is by itself reason enough to have faith in God.

The heart pumps blood non-stop through a vascular network 96,600 kilometers (60,000 miles) long, the equivalent to twice the Earth's circumference at the equator.[99] It is astonishing that such a network should have been installed inside the body. Some mathematical information will detail this miracle even more. The total length of the

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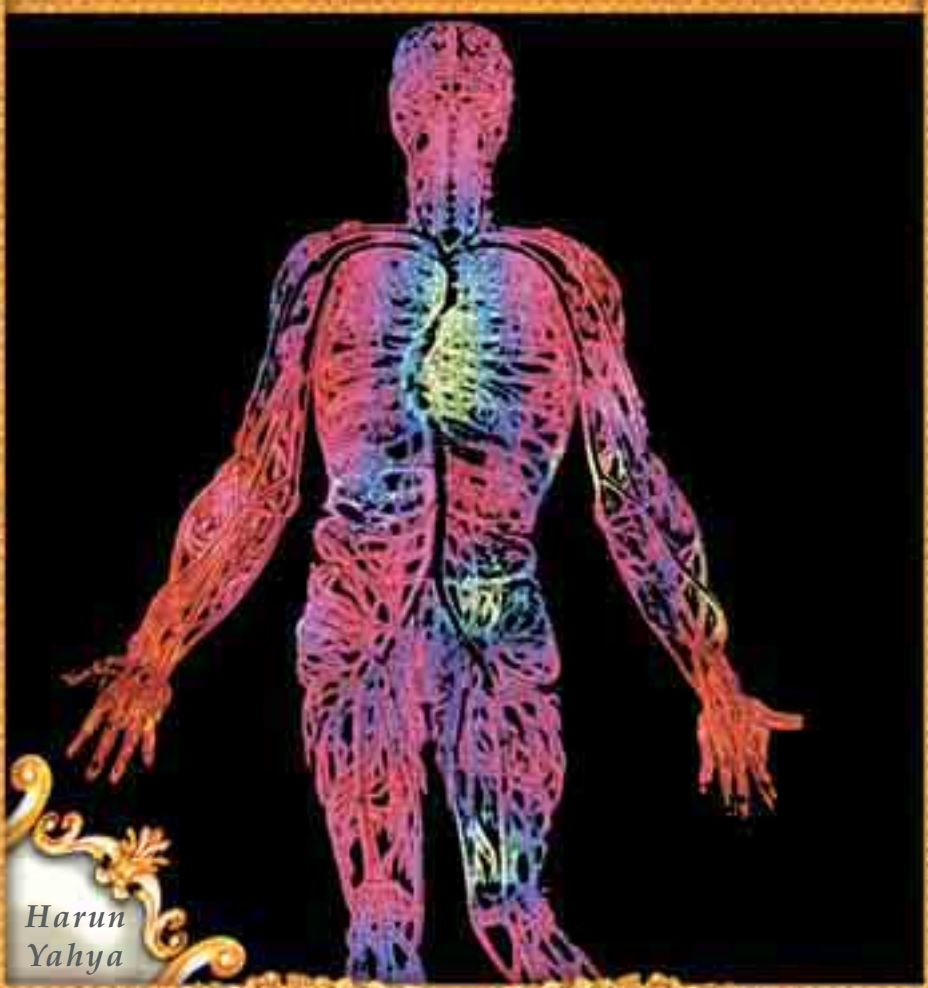
body's capillaries, some visible only under a microscope, is 60,000 kilometers (37,280 miles).[100] Their total surface area is almost 8,000 square meters (3.1 square miles). In the lungs alone, there are 300 million capillaries. If were laid out, end to end, they would stretch for 2,400 kilometers (1,491 miles).[101] The length of the capillaries in the brain is around 650 kilometers (403 miles). That, for example, is the distance between the



cities of Boston and Washington DC, in two totally different states in the USA.[102]

These are just a few of the innumerable facts that prove there is no room for coincidences in the human body. Another miraculous aspect of this is that generally, humans are totally unaware of this splendid network, thousands of kilometers long, extending to 100 trillion cells. You see no trace of it when you glance in the mirror, never feel its ceaseless activity, seldom become aware of the noises your heart produces as it beats. So perfectly created is this system that barring the emergence of some defect, you spend your life quite problem-free, unaware that minor defects are repaired without your knowledge. Nobody in the world, no community, and no technology possesses the ability to produce a living network so flawless, flexible, and impressive. This work of art belongs to God, the Creator of all things, the Generous, the Lord of all the worlds.

Consider this network, which extends to 100 trillion cells, in more detail. Everywhere in your body, from eyelids to toes, from your hair roots to your eyelashes, is linked by this perfect structure. Were this network not to reach one single region or organ, it would decay. Remember that without blood, the body itself cannot breathe, and will die.

How does this impeccable distribution come about? It is important to know the details in order to appreciate the groundlessness of the claims made on the subject based on "chance." The body's circulatory system consists of three different types of blood vessels, brought together for three different purposes.

The Journey of the Small Red Blood Cell

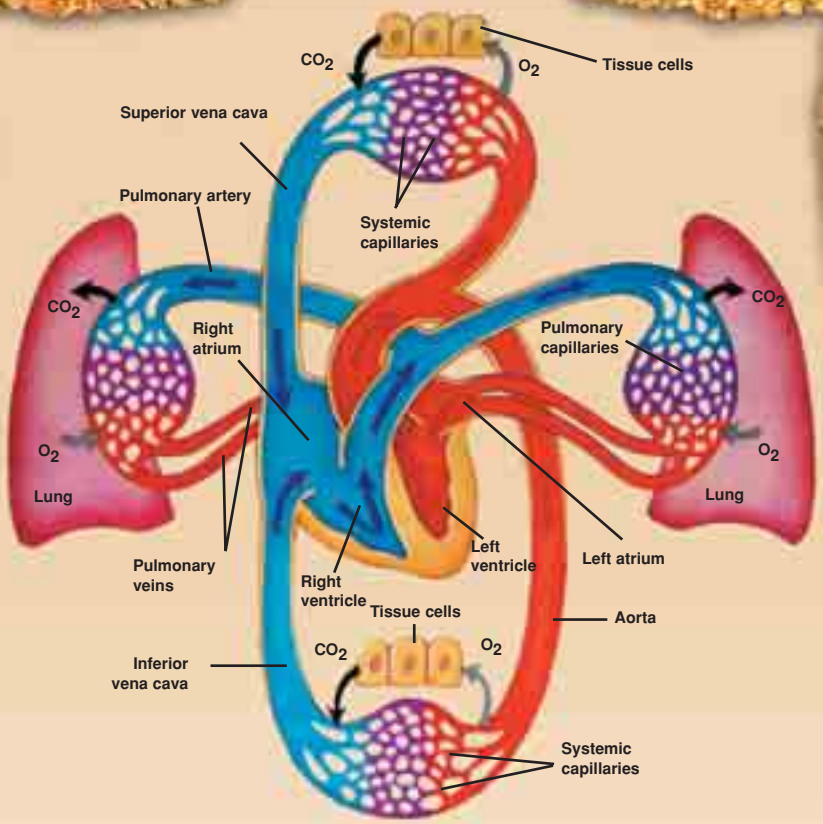
In order to join the bloodstream, the first place that a red blood cell produced in the bone marrow will reach is the left atrium, where oxygenated blood is collected. The purpose behind the red blood cell being here is to load up with oxygen and transport it to the other cells of the body. Leaving the left atrium in order to join the circulatory system, the red blood cell first encounters a giant door. After passing through it, there is no means of going back. It has now reached a much wider chamber—the ventricle. Here there are many cells like itself, and blood exceptionally rich in oxygen. Thanks to a powerful pump in this large section, it passes through another door and enters a narrow tunnel, or artery.

The small red blood cell is now in the body's *greater circulation*, or *systemic circulation*. By means of this great circulation, our small cell has now entered a tunnel system that travels the entire body, with the exception of the lungs. The first tunnel the red blood cell enters is the aorta, the most powerful artery in the body.

Oxygen Is Distributed to the Cells

The aorta is where the blood leaves the heart. It contains a rather large amount of blood and in a normal adult is about 2.5 centimeter (1 inch) wide.[103] Since this artery will distribute oxygenated blood to the other arteries, it must be especially strong and resistant, because the blood transported through it is under high pressure. It also possesses a very special structure, as one would expect.

The aorta and the pulmonary artery that leave



A red blood cell begins its journey in the left atrium. It then travels through the whole body, from the toes to the brain, by way of blood vessels and capillaries measured in mere millimeters. It deposits oxygen at the tissues and takes up carbon dioxide, enabling it to be given off by the lungs when it completes its journey.

the heart consist of three layers. First, there is an outer casing consisting of fibrous connective tissue, whose presence is of the greatest importance. The elastic fibers in it provide resistance against pressure. If the arteries lacked this property, then the blood arriving from the heart under high pressure would inevitably damage, even tear them. This particular feature exhibited by God in this important artery is another manifestation of His title of "He Who cre-

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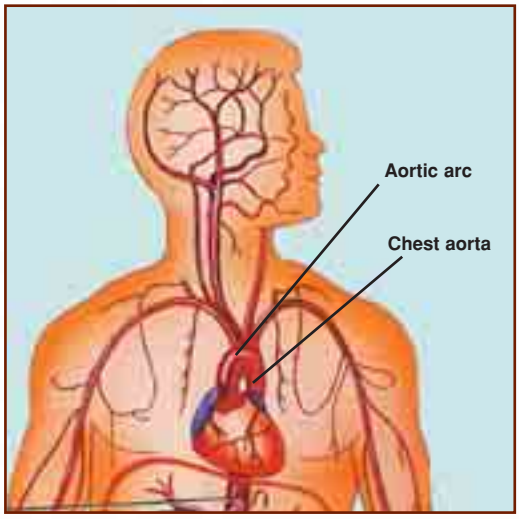
ates with no previous model" (*Al-Badee'*). Bearing in mind that these heartbeats take place hundreds of times a day, then logically, the probability of the artery tearing or rupturing should be very high. Yet the protective system in question has eliminated that danger, ensuring that the artery can resist that pressure for a whole lifetime. This is also a reflection of the affection in which God, Who protects and observes, holds His servants.

In the middle layer of the aorta are elastic fibers composed of smooth muscles, of great importance in terms of regulating the amount of blood sent. By contracting or expanding, the muscles serve to narrow or widen the diameter of the artery. The quantity of blood going to the organ and tissues is balanced thanks to this elastic structure. The inner surface of the aortic and pulmonary arteries consists of a lining made up of a single row of flat epithelial cells.[104] Thanks to this tissue, it's as if the interior surface had been polished. This smooth, slippery surface reduces friction and allows the blood to flow easily and quickly.

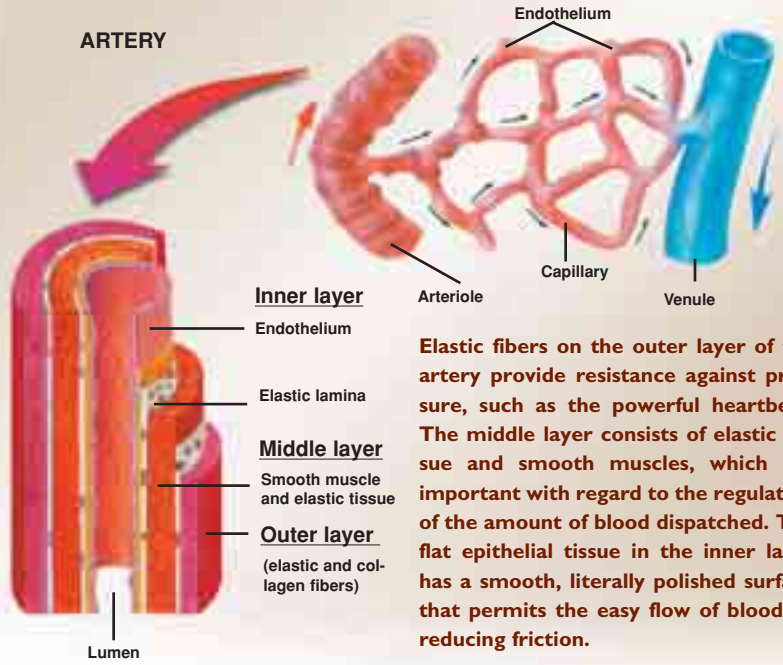
The aorta drawing away to the left in the form of a bow, divides in two. The section that heads upward leads to the head and arms, and the artery that branches off downward reaches the other organs by means of various sub-arteries. Under resting conditions, these arteries generally distribute oxygen to the tissues within about 10 seconds of receiving it from the lungs. When a person engages in strenuous exercise, however, the speed of the blood in the arteries increases. The red blood cells can now transport oxygen in as little as 2 or 3 seconds. They therefore, with the inspiration they receive from God, possess the ability to meet the changing needs of the body.



The aorta leaves the heart and divides in two: The upper branch goes to the head and arms, and the lower to various subsidiary vessels and organs. When the body is at rest, the oxygen is transported to the tissues in less than 10 seconds after it is picked up from the lungs. During exercise, this period is reduced to 2 to 3 seconds.

The special property mentioned above is extremely important. Thanks to their elastic muscular structure, which is capable of expanding, the arteries have a storage function that allows there always to be blood in the body. This elasticity in the arteries is also important, since their flexibility prevents the pressure from rising too high when blood is pumped through the system. At the same time, elasticity permits a constant flow of blood through the tissues by maintaining a high arterial pressure between heartbeats.[105] God has created this elasticity, which is necessary in many aspects in order to maintain the body's equilibrium.

The arteries lie generally deep within the body. In some places, however—for example, in the wrist, the temples, neck, the backs of the feet and ankles—they are much closer to the surface. In these regions, the passage of blood as it strikes the arterial wall under high pressure can be felt under the skin with every heartbeat.



Elastic fibers on the outer layer of the artery provide resistance against pressure, such as the powerful heartbeat. The middle layer consists of elastic tissue and smooth muscles, which are important with regard to the regulation of the amount of blood dispatched. The flat epithelial tissue in the inner layer has a smooth, literally polished surface that permits the easy flow of blood by reducing friction.

That the arteries are hidden deep inside the body is a precaution of the greatest importance. Thanks to this, arteries are not easily damaged. By means of this flawless order, our Lord—Who created the arteries, the blood inside them and Who regulates these at all times—has protected humans from the serious dangers we may encounter. That alone is enough reason for a person to turn to God and give thanks.

At times of injury, it is generally the veins that suffer damage. But as we shall be seeing in some detail, these do not carry high-pressure, viscous blood. During injury, therefore, the blood flowing in a heavy, dense form has the prospect of clotting easily. In the event that an artery is damaged, however, the bright, high-pressure blood is

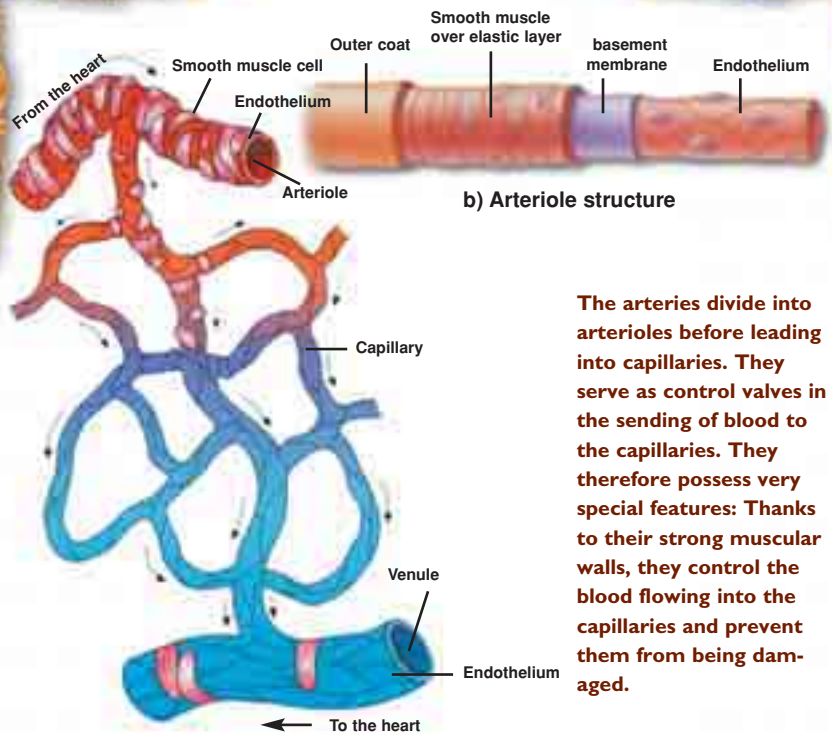
expelled very quickly. This is most dangerous since the bleeding can swiftly result in death unless immediate precautions are taken.

Arterioles: Arterial Connection Points

In order for blood to be distributed from the arteries, those arteries have to subdivide. For that reason, the main arteries 2.5 centimeters (1 inch) in diameter subdivide until they assume the form of capillaries just a few microns in diameter. At this point, our red blood cells continue their journey down these dividing passages. Because of the high blood pressure in the arteries, the erythrocyte can travel a long distance inside the body in a matter of seconds, its objective being to reach the capillaries and deposit the oxygen it is carrying.

Arterioles are the smallest branches in the arterial system—the arteries' final state before they finally lead into capillaries. These serve as control valves in sending blood to the capillaries. Arterioles possess a most important powerful muscular system capable of completely closing themselves or else widening severalfold, mainly to alter the blood flow reaching the capillaries, and to be able to send the tissues as much oxygen and nutrients as they need. They prevent these very delicate vessels from being damaged by the sudden entry of high-pressure blood. The resistance of the arterioles accounts for approximately half of the resistance in the entire systemic circulation, which is greater than anywhere else in the circulation.[106]

The flow of blood to all tissues is controlled almost entirely by small arteries and arterioles. But even the smallest vessels are able to affect that flow. They



The arteries divide into arterioles before leading into capillaries. They serve as control valves in the sending of blood to the capillaries. They therefore possess very special features: Thanks to their strong muscular walls, they control the blood flowing into the capillaries and prevent them from being damaged.

may cause the flow to stop completely, besides regulating its speed, because they are able to determine to which cells they will give special treatment. In order to be able to carry out this delicate determination, the blood leaves the small arteries and enters the arterioles, just a few millimeters long and 8 to 50 microns in diameter. Each arteriole divides into branches so as to be able to supply 10 to 100 capillaries.[107]

The small red blood cell, having entered an arteriole, then branches off to the tissue it will subsequently feed. It needs to enter a capillary in order to supply oxygen and nutrients. It will pass one of the arterioles—the control valves, in other words—that will act as a guide for it. The time has now come for it to do its job.

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Intelligent Capillaries Thinner Than a Human Hair

If you live in an average-size home, it will have a floor area of approximately 150 square meters (1,615 square feet). The total surface area of the 10 billion capillary vessels in your body is 3.5 times greater than that—about 500 square meters, or 5,382 square feet.[108] While making this comparison, recall that the largest capillary is just 9 microns across. (Nine microns is 9/1000th of a millimeter.) Indeed, some capillaries are so tiny that they are visible only under a microscope. This broad network, installed so as to reach every point in the body, is a most splendid one that should remind people again and again of the greatness of God.

The artery that enters any organ divides and thins six to eight times before becoming an arteriole, the capillaries' control valve. Subsequently, the arteriole itself will branch two or three times, reducing its diameter to just 9 microns, and will continue on as a capillary. Some of these capillaries are so small that they cannot let even some large blood cells pass through them. Even red blood cells pass through such capillaries in single file, or else by distorting their shape.

The blood proceeding along the arteries at 1.5 kilometers an hour (0.93 miles per hour) slows down by a thousandth of that rate when it enters the capillaries. Every region of the body has been penetrated by an extraordinarily wide ranging network of capillaries. The capillaries in just one single person could stretch from one end of the USA to the other.[109] This incomparable mechanism is brought into being to nourish all the cells in the body. In fact, a cell can be no further than 20 to 30 microns from a capillary—a

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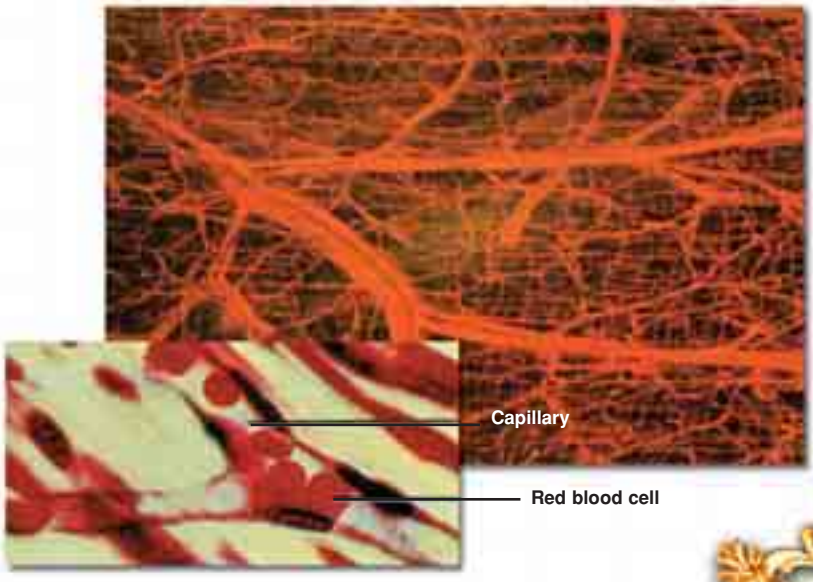
distance of 0.02 millimeters (0.0007874 inch), which is sufficient to grasp the scale of this magnificent network that visits 100 trillion cells.

A person can comprehend the magnificence of the system confronting him only when he stops to consider these features in detail. Otherwise, the account will be no different from what can be found in any physiology textbook. How this marvel of engineering, in thicknesses of just a few microns, can reach every cell in the body is an extraordinary creation. Your hands, face, feet, arms and every square millimeter of your body all possess a perfect network of countless capillaries. Even more astonishingly, all these networks are interconnected, each one being fed from a single source. Add in the fact that just one of your fingers

possesses hundreds of capillaries, and you can better understand the scale of this marvel. This perfection that you view came into existence solely through God commanding it to *Be!* and God, the Lord of the worlds, Lord of the heavens and Earth, has the power to create even greater perfections. Indeed, God reveals this truth in the Qur'an:

> **The creation of the heavens and Earth is far greater than the creation of humanity. But most of humanity do not know it. (Surah Ghafir: 57)**

In these tiny vessels, there are still more miracles created by God. Capillaries have a much greater importance than is indicated by their size. These vessels ensure the exchange of fluid, nutrients, hormones and other substances between blood and the tissues. In line with that responsibility, the walls



The capillaries are so narrow that they refuse to permit many substances to pass through. Even tiny red blood cells can pass through only in single file or by changing their shape.

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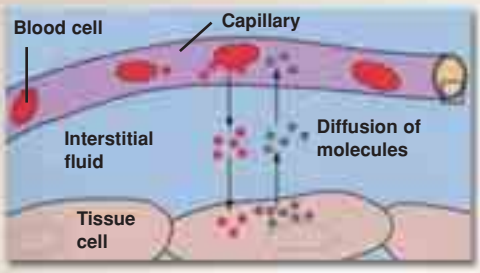
of the capillaries are exceedingly thin, and possess special structures that permit small molecules to pass through them. In short, such vital functions as nourishing the tissues and providing them with oxygen, while collecting their wastes, all take place thanks to these capillaries.

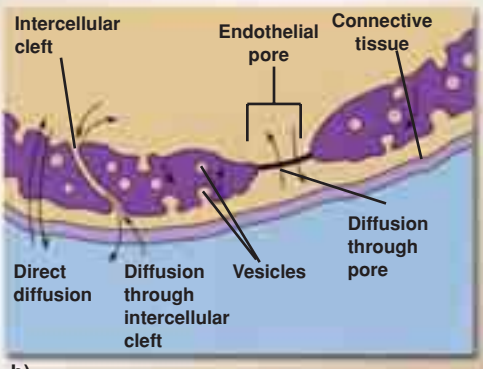
The capillary walls are 0.5 microns in thickness. In these walls, there are a number of gates through which substances are exchanged. All essential substances for the cells must pass through these gates. However, some plasma proteins are too large to be able to pass through. This means that only appropriate substances can cross into the tissues, and that other molecules must stay in the blood and continue on their way. At the same time, these proteins prevent blood plasma from

WHAT IS THE TRANSPORT MECHANISM OF CAPILLARIES?

a) An exchange of substances between the blood and the tissue cells takes place by means of the interstitial fluid.
b) This diagram shows the four different means of transport through the endothelial cell wall.



a)



b)

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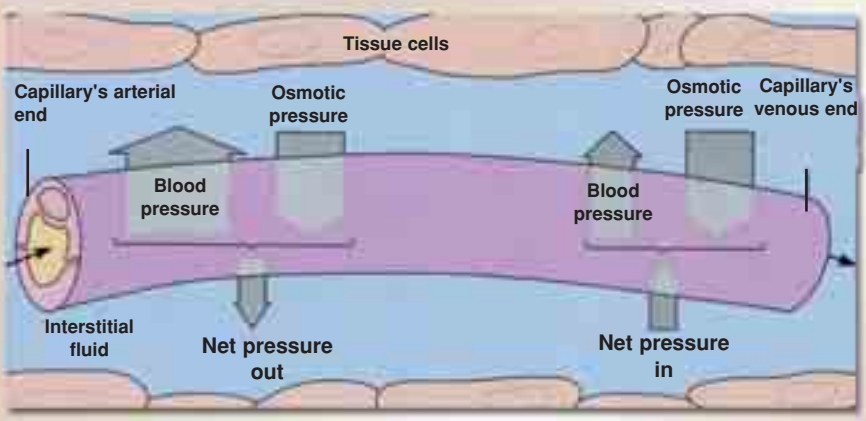
leaking into the tissues. Since there is no more than a very small amount of leakage of fluid and proteins into the tissues, no situation arises that might damage the exact balance in the body.[110]

Fat-soluble substances, on the other hand, need not pass through the capillary gates. They can directly diffuse across the capillary membrane. This is most important, because this facilitated passage permits oxygen and carbon dioxide to be transmitted rapidly and in large quantities. Therefore, these gasses are transported at a speed several times greater than substances such as sodium and glucose, which are not liquid-soluble. This is in direct proportion to the tissues' needs for these gasses, which can pass the gates only when the need arises.



c) Flow of fluid across the capillary walls generally depend on the difference between blood pressure and osmotic pressure at different points of the capillary bed. Blood pressure establishes an outward force. Osmotic pressure, on the other hand, draws the fluid back. As a result, fluid is expelled from the capillary by means of clefts at the arterial end, and is taken in the blood again in the venous end.

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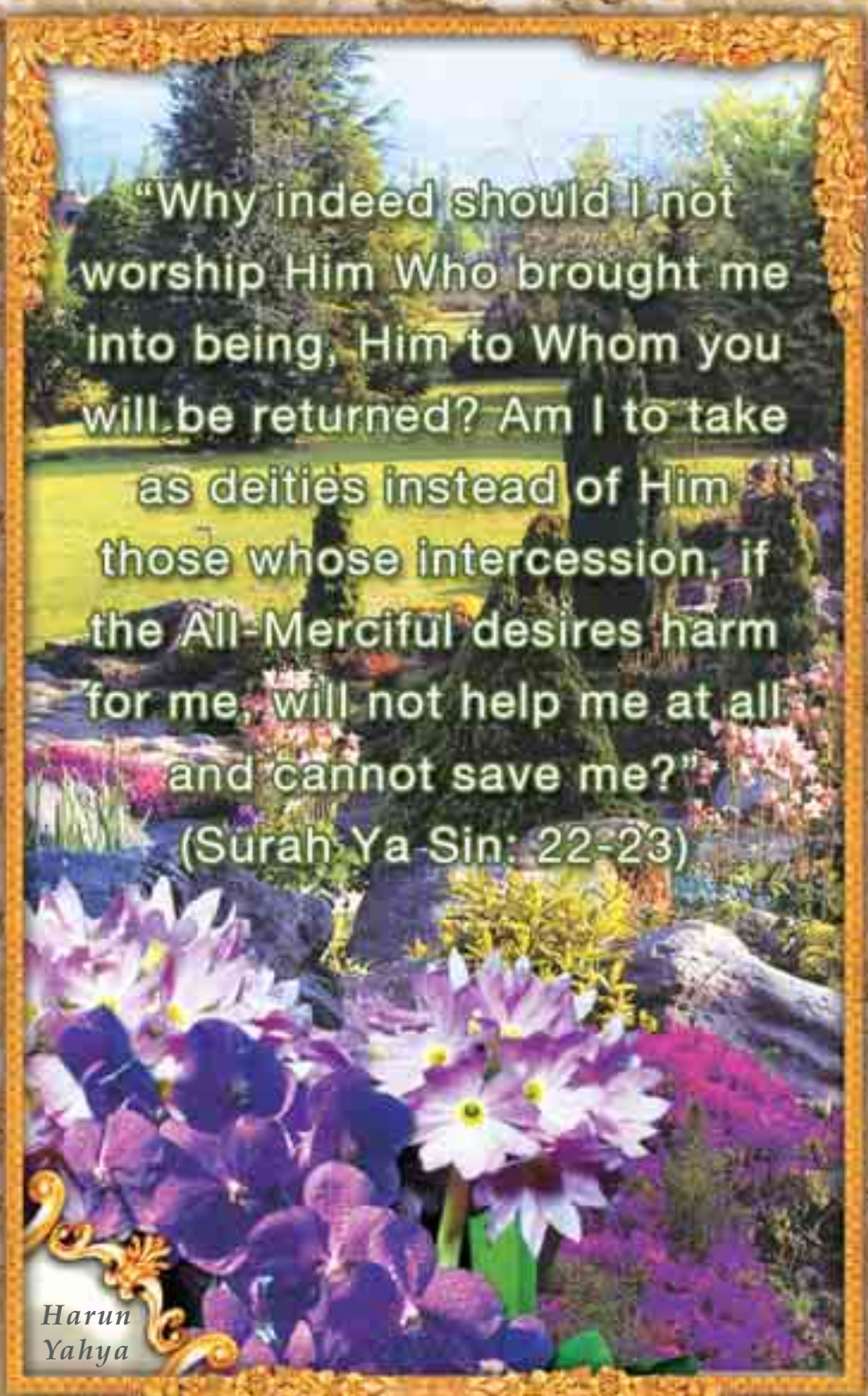
"Why indeed should I not worship Him Who brought me into being, Him to Whom you will be returned? Am I to take as deities instead of Him those whose intercession, if the All-Merciful desires harm for me, will not help me at all and cannot save me?"
(Surah Ya Sin: 22-23)
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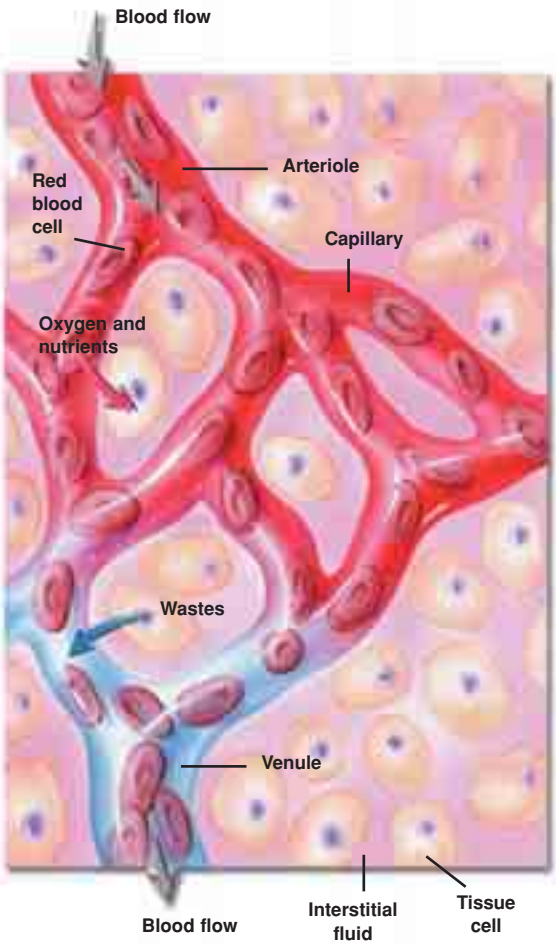
These intelligent pipes, just a few microns in size and consisting of connective tissue and muscle tissue, control the flow of blood according to the need of the individual tissue cells. This control is a very definite blessing from God. Through this important precaution blood does not flow through the capillaries constantly, but is sporadic. If the tissue requires a large quantity of blood, then the capillary expands under the effect of a superior control mechanism and extends the period during which blood flows. In this way is provided a greater flow of blood, and thus of oxygen and nutrients.[111]

Having entered, our small red blood cell continues through this narrow zone with difficulty, and in stops and starts. Thanks to the hemoglobin molecule inside it, it is ready to deposit the oxygen it has carried en route. It approaches every cell in need of oxygen, and deposits the oxygen molecules in a very careful way so that they will harm neither itself nor the cell. In return it picks up the carbon dioxide that the cell needs removed. Now ready for its return journey, it has picked up another load and must return to its destination—the heart, the first center where it picked up its load.

The work these capillaries do is clearly precautionary; something that only an intelligent entity such as a human can perform. However, the truly noteworthy events taking place in the body are unknown to the great majority of people. Most reading these lines will be learning for the first time about these bodily phenomena, such as those in the capillaries, and will be newly aware of the precautionary measures taken. Once again, you can see that it is not the human beings who take these precautions.



A red blood cell approaches the tissue cell in need of oxygen and deposits oxygen in it. With the carbon dioxide it has taken from the cell, its charge is now different and it now sets out through the veins toward the heart.

God creates the most perfect works on Earth. It is sufficient to see them in order to comprehend the source of intelligence manifested in them. God reveals the following about those people who can see and those who cannot in His verses:

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Say: "Who is the Lord of the heavens and the Earth?" Say: "God." Say: "So why have you taken protectors apart from Him who possess no power to help or harm themselves?" Say: "Are the blind and seeing equal? Or are darkness and light the same? Or have they assigned partners to God who create as He creates, so that all creating seems the same to them?" Say: "God is the Creator of everything. He is the One, the All-Conquering." (Surat ar-Ra'd: 16)

The blind and the seeing are not the same. Nor are those who believe and do right actions the same as evildoers. What little heed they pay! (Surah Ghafir: 58)

The Veins: The Return Journey in the Giant Circulatory Network

While the red blood cell loads with carbon dioxide and gets ready to return, the tunnel around it widens increasingly as it moves away from the capillaries. A great many erythrocytes and other cells have joined it, and they move through the increasingly widening tunnel like a great army. By now, the blood pressure moving them has fallen. Subsequently, they will need to progress more slowly. Their bright red color imparted by the oxygen has almost entirely disappeared. It is now a darker color, purplish, because the load they are carrying is carbon dioxide.

These giant tunnels through which the red blood cells proceed on their way are veins, the vessels by which the cells traveling through the body return home. The widest veins are as thick as a pencil.[112] The cells in the bloodstream carry the carbon dioxide and other wastes they've collect-

ed from the tissues to the heart for expulsion from the body or to be re-used.

The heart meets the two large veins. One is the superior vena cava, which comes from the head, arms and upper body, and the other, the inferior vena cava, which comes from the lower body. Carbon dioxide in these veins returning to the heart will be expelled by means of the lungs, and the blood cells' endless journey will start again from the beginning, with oxygen molecules. The small red blood cell will perform this function many times, 1,000 times in the course of a single day, without ever growing tired and resting.[113]

Just like the arteries, the veins are very large blood vessels. But their muscular walls are thinner than the arteries'. The main reason is that the blood no longer flows under such high pressure on its return journey. Even though the veins have no need to be able to withstand pressure, there is a most important reason for their being muscular. Thanks to their muscular walls, the veins can store large amounts of blood by enlarging and constricting. This blood they store is kept ready for use whenever needed, anywhere in the circulation.[114]

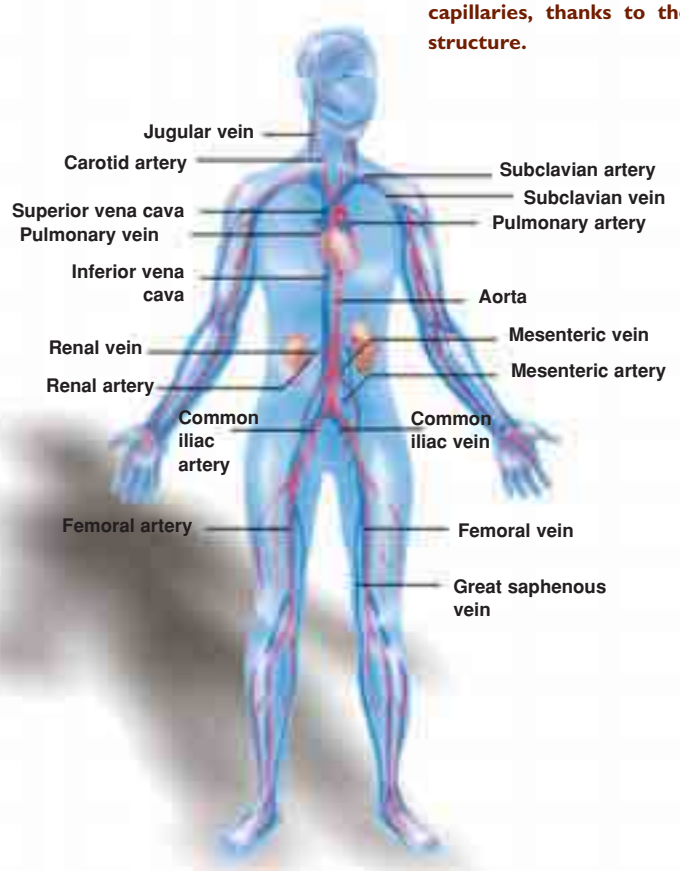
Here it will be useful to provide some important information: 84% of the entire blood of the body is in the systemic circulation, with 64% on its return journey in the veins. The proportion of blood in the arteries is just 15%. The capillaries extending for 60,000 kilometers (37,280 miles) in the body contain only 5% of the blood. The heart contains 7% of the blood, and the pulmonary vessels 9%.[115] The most striking aspect of this is the high level of blood in the veins, and the low level in the capillaries. The veins carry three times as much blood in systemic circulation as the arteries

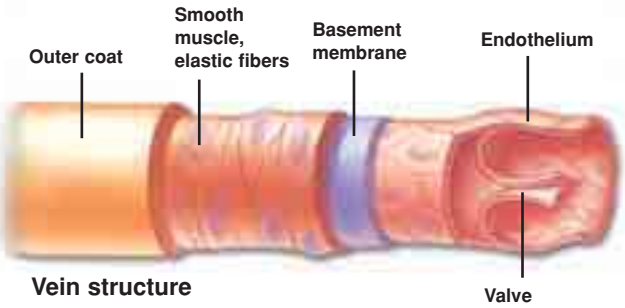
and capillaries. The veins carry so much blood, as stated earlier, thanks to their blood-storage duty.

The level of blood in the capillaries, on the other hand, is rather low compared to their work. There is a constantly controlled flow of materials to these fine blood vessels.

When the body begins to lose blood, and when blood pressure begins to fall, pressure reflexes arise in various parts of

Veins are able to carry three times more blood than do the arteries and capillaries, thanks to their special structure.





Vein structure

Unlike the arteries, the veins are not subjected to strong blood pressure, and therefore have different structures. Thanks to their muscular walls, the veins can store large quantities of blood by enlarging and constricting. Thus blood stored in the veins is available for immediate use in emergencies.

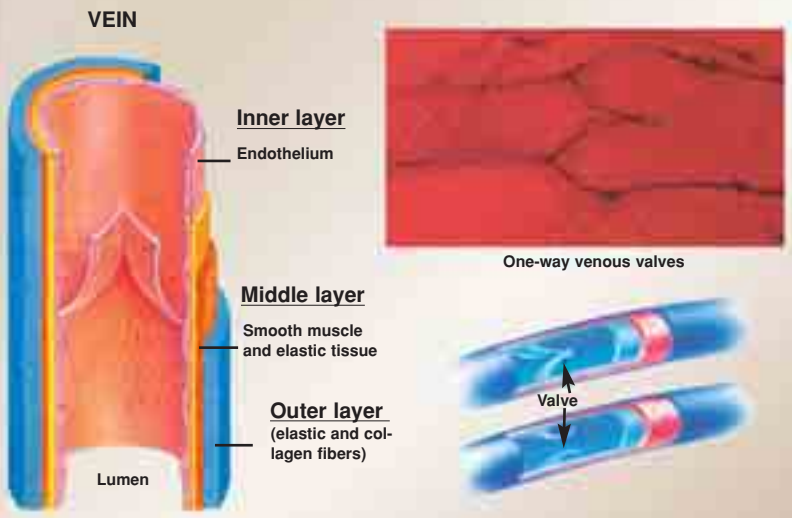
the circulation, and these send nerve signals to the veins. Receiving this information, the veins begin to constrict and, thanks to this ability, are easily able to overcome the body's blood loss. Even if 20% of the blood is lost, thanks to the special reservoir system of the veins, no problem occurs: The circulatory system continues to function as before.

Being under low pressure, it might appear difficult for blood in the veins to move through the body, especially upward toward the heart. However, this problem has been resolved with another perfect system. Every moment you move, the muscles in your body create pressure on the veins and help the blood to move. The pressure applied by your leg muscles to push blood upward is equal to the downward pull of gravity. When the veins leave the skeletal muscles after passing through very mobile regions like the legs or arms, the respiratory muscles assist them. The blood in the inferior vena cava, immediately beneath the lungs, moves with every breath we take. Therefore, the pressure

set up by the chest cavity helps the blood continue on its way to the heart.

The veins have additional ways of controlling the flow of blood. The most important of these are small valves, unique to the veins, and not found in the arteries. These valves permit blood in the veins to flow in one direction only, similarly to the valves in the heart, and close again behind it, preventing the blood, moving under low pressure, from running back down again.[116] There is no need for such a mechanism in the arteries, where pressure is very high and there is no possibility of the blood moving backwards. This system has been created by God in a flawless and detailed manner, and each type of blood vessel possesses the ideal system to transmit blood. This imposing mechanism in the veins is without doubt the work of God, **"Who created and molded"** (Surat al-A'la: 2) and is **"the Creator, the Maker, the Giver of Form"** (Surat al-Hashr: 24). He created human beings and made the innumerable complex mechanisms in the human body as proof of this creation.

Despite this difference in pressure, the amount of blood flowing from the arteries and the veins is always the same. The body needs such equilibrium, or else blood will accumulate in certain sites in the body. Because of lower pressure in the veins, the blood doesn't flow fast as in the arteries. In other words, it seems impossible for the veins to carry as much blood as the arteries; yet that is not actually the case. Since the veins' lumen diameter is wider than arteries', they can carry large amounts of blood. In other words, blood flows rapidly in the arteries, and in large quantities in the wider veins. The level of blood heading out and returning to the heart is thus perfectly balanced.[117]



As a requirement of the work the veins perform in our bodies, they possess a different structure. Valves in the veins can open and close as deoxygenated blood is carried back to the heart. Thanks to them, blood is prevented from flowing backwards and always forwarded to the heart.

How do the veins know that they need to possess such valves? This example once again shows us the superior knowledge and creation of our Lord, Who created us so perfectly.

The concept of balances within the body may be unfamiliar to most people, because they spend their lives with no great difficulties. Yet there are innumerable balances in the body that need to be maintained and should never be impaired in any way. The blood's circulation is just one example. Many factors might have a negative effect on this equilibrium, but the system for keeping this balance is so incomparable that the amount of blood leaving the heart and the blood returning to it are always the same.

If this balance is disrupted, blood sent out to the extremities cannot return, but will accumulate in var-

ious places in the body. That will cause edemas and injuries from burst veins, if not gangrene. Since insufficient blood returns to the heart, the amount of oxygenated blood will be very low, and clean, oxygenated blood sent by the heart will be insufficient for nourishing the body. If this imbalance persists, the organs will begin to die.

Considering the importance of the equal amount of blood coming and going, you can clearly see that this is a perfect balance specially created by God, in His name as The Giver of Life (*Al-Muhee*). As we examine everything in detail, we become better acquainted with God, our Creator, and can comprehend His might. It shows us that we owe God for everything. For all the blessings created by God, a person must praise Him constantly and live for His approval. The unbelievers seek for alternative explanations for the signs of creation in living things, and with those explanations, think that they can make others deny the existence of God and His creation. However, God is the Superior, the Powerful, the Mighty and the Unconquerable. This fact is stated in a verse:

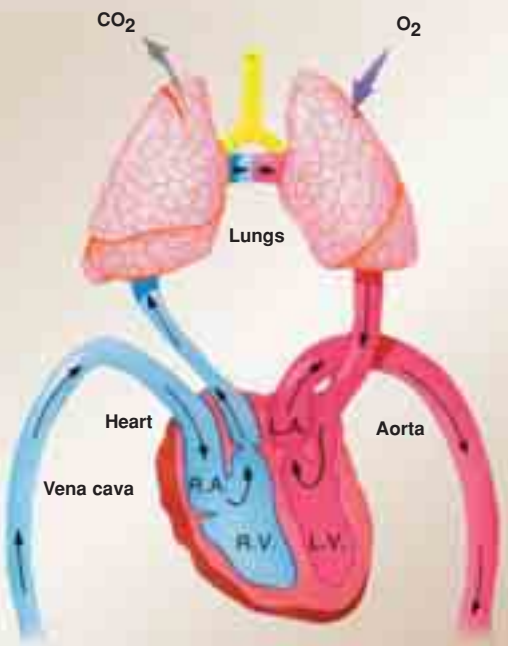
> **God has written, "I will be victorious, I and My messengers." God is Most Strong, Almighty. (Surat al-Mujadala: 21)**

After its journey in the veins, blood returns to the heart to be transported to the lungs, where the transported carbon dioxide will be dropped off. The only veins in the body that carry oxygen-rich blood are the pulmonary veins. When we examine the "pulmonary circulation" in the body, you will better understand why the pulmonary veins assume such a different responsibility.

Blood Oxygenation in the Lungs and Pulmonary Circulation

Since the red blood cell began its journey and traveled through the entire body, 40 seconds have passed. It is now back at the heart where it has begun, now traveling in deoxygenated blood. However, it is essential to clean this blood. Therefore, the red blood cell takes its place in the right atrium in order to begin this new journey, known as the *pulmonary circulation*.

This time, everything will occur at the right side of the heart. With the opening of the valve on the right atrium, the cell and its companions move into the right ventricle. Once it



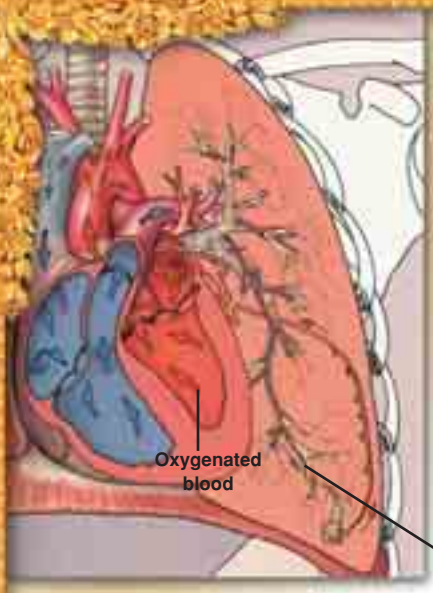
The circulatory system carries oxygen from the lungs to the tissues. Carbon dioxide, on the other hand, is transported from the tissues to the lungs. Glucose is absorbed by the intestines and stored in the liver temporarily in the form of glycogen. Later it is sent to the tissues. This flawless division of labor once again reveals the flawlessness in God's creations.

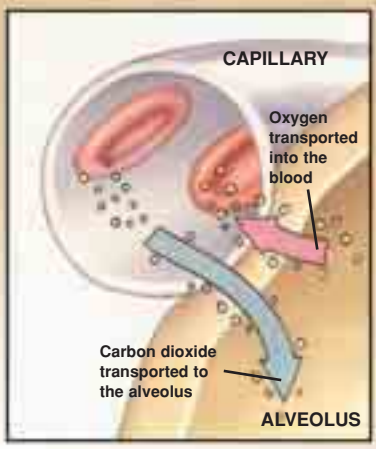
has, the right ventricle's valve closes, and it cannot turn back. It stays in the right ventricle for a short instant, until the second valve opens the way to the lungs. The cell's second journey has begun—shorter than the first, however, which is why it is also known as the *small circulation*.

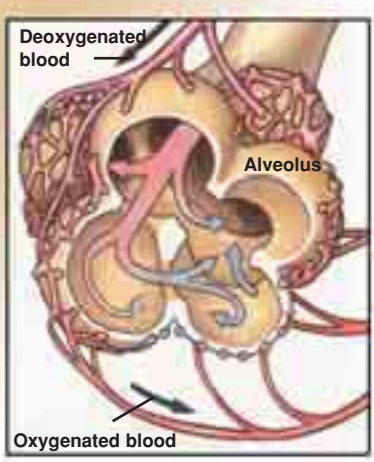
From the right ventricle, the blood reaches the pulmonary artery, which divides into the right and left pulmonary branches. These two vessels lead to the lungs, further dividing at the membranes of the alveoli—air sacs where oxygen and carbon dioxide are exchanged—into various capillaries. The newly oxygenated blood is carried by the pulmonary vein to the left atrium of the heart, where its journey began. This is how oxygenated blood is carried by a vein for a change.

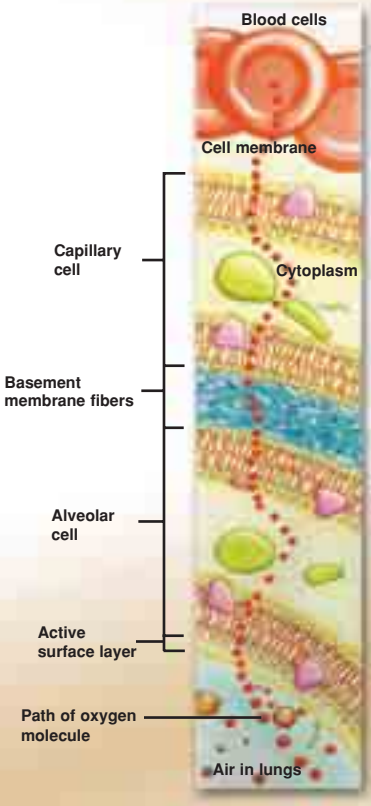
The air enters the lungs by way of the bronchi, which are divided many times until they end in the alveoli. In the lungs there are some 300 million alveoli, all of their membranes covered with capillaries for the exchange of oxygen and carbon dioxide. It is not hard to estimate the diameter of the capillaries in the lungs. The surface area of the alveoli is 70 square meters (750 square feet), which is about the size of a racquetball court. With their walls just 10 millionths of an inch thick, the capillaries and alveoli fulfill functions of vital importance to us.[118]

This exchange of gasses that takes place in the lungs is truly miraculous. Each minute, the lungs send 56×10^{21} (the number 56 followed by 21 zeros) oxygen atoms to cells all through the body.[119] All you have to do is to breathe. With the amount of the air we inhale throughout the day, this magnificent exchange of gasses in our lungs takes place at enormous speed. Following this exchange,









The barrier between the air in the alveoli and the blood in the capillaries is a total of 4 micrometers thick—equivalent to half the diameter of a red blood cell. The extreme fineness of this barrier shows how very swift and effective the two-way exchange of gasses across this barrier is.

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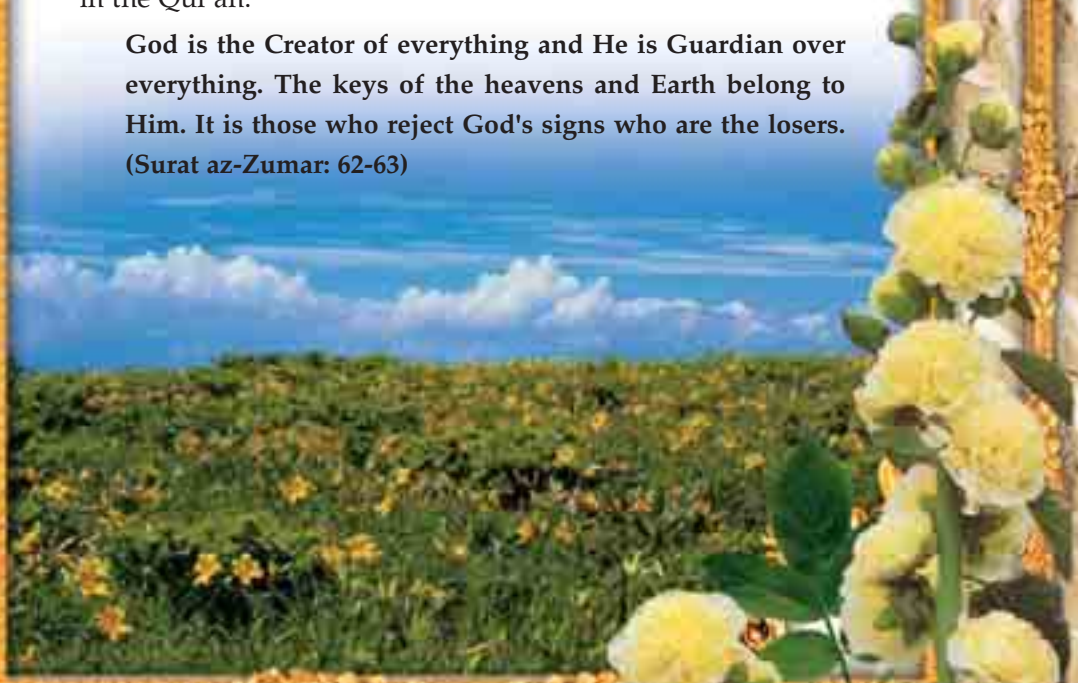
our small red blood cell, now loaded with oxygen, has returned to the beginning of its journey in the left atrium to carry oxygen to the tissues. This extraordinary journey, which has been explained in general terms, has lasted less than a minute.

Recall that if the capillaries were slightly further from the alveoli, then that vital exchange would be impossible. The fact that they are located right beside the alveoli is yet another example of the perfect and amazing design we have encountered throughout this book. Not even a human using his reason, able to plan and engineer, possesses the ability to make such a flawless design, which reveals its presence clearly at all points inside the body. This is the work of a Great and Mighty Power. God introduces Himself to us by these important proofs of creation. It is easy for anyone of understanding to see the works of God. God has revealed this important truth in the Qur'an:

God is the Creator of everything and He is Guardian over everything. The keys of the heavens and Earth belong to Him. It is those who reject God's signs who are the losers. (Surat az-Zumar: 62-63)



The Blood-Flow Control Mechanism

Weighing the advantages and disadvantages of something to be done, and taking the relevant precautionary measures, is an ability peculiar to reasoning human beings. However, looking at the human circulatory system, we can see that some of the excellent organizations in the body are more intelligent than human beings. They have the huge responsibility of sustaining human life! Therefore they need to continue their journey without any breaks, never making a mistake, and most important of all, by foreseeing all situations and conditions.

There is considerable evidence that the mechanisms in the body are intelligent. As mentioned before, the needs in the body are identified. This is carried out in a superior mechanism, by God's inspiration. The heart, blood vessels and the cells carry out an extremely conscious organization. According to this, the heart pumps

a specific volume of blood, the red blood cells distribute the oxygen they carry to tissue cells and, most importantly, the blood vessels direct its flow to its destinations.

While you are sleeping or resting, your heart doesn't need to pump as much blood. When you sleep, the heart pumps only the blood needed to keep you alive—of course a valuable saving. When you get out of bed and begin walking, your heart rate increases. Before you meet any difficulty, the message is transmitted that your body is moving and the muscles need more blood. When you begin running, your heart's pumping speed and volume increase by 6 to 7 times.

The body is very thrifty in this regard. The same quantities of blood are not delivered to every point in the body at every moment. Blood is directed to your stomach when you eat, in your lungs and your muscles when you swim, and in your

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brain when you concentrate on reading—because the cells mostly in need of nutrients and oxygen are in those areas.

Thrift is not valid for those times only. Under normal conditions, the body makes no special effort to nourish the muscles, which comprise 30-40% of the body's weight. The amount of blood going to the muscles during periods of rest is astonishingly low. When you begin to work your muscles, however, your metabolic activity increases 50 times, and the blood flow to your muscles increases 20 to 25 times.[120] This is really an astonishing change, but during exercise, muscles need this extreme flow of blood. If they were to require such a large quantity under normal conditions, then it would be impossible for the heart to keep up. The intelligent controllers of the body prefer to divert existing blood in more essential and important areas, such as the brain.

When we engage in sports, our muscles need 20 to 25 times more blood than normal. If our muscles needed that much blood even under normal conditions, the heart would be unable to match that extreme tempo. Yet our Lord, Who has created all things with a measure, has created our hearts and muscles to be compatible with one another.

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The brain is in constant need of nourishment and oxygen, since everything that takes place in the body, and all the organs are under its control. Interestingly, the heart, blood vessels and blood cells seem to be aware of this vital fact. For that reason, the flow of blood to the brain always continues. Every minute, the arteries need to transport approximately 1 liter of blood to the brain. During bleeding, any decreased blood level in the body is communicated to the brain by the nerves. The blood vessels in the brain enlarge or constrict in order to adjust themselves to this emergency situation. Blood vessels in less important organs, aware of the situation, halt their own flows in order to protect the brain function. Thus, once again we find the intelligence that shows itself in every point in the body.

The blood flow of every tissue in the body is controlled in such a way for meeting its requirements—neither more nor less. For example, the flow of blood to a tissue needing a lot of oxygen is as much as it needs, or maybe a little more, but never greater than that. This impeccable control keeps the heart's activity to a minimum, while never allowing the tissues to be nourished insufficiently. This amazing control keeps the heart's workload at minimum level.[121] The blood vessels open their pathways—in other words, enlarge—only for the tissues in need, and paths to other tissues less in need of blood constrict. Here lies the importance of the perfect muscular structure of the blood vessels.

What if there were no such control system, so that every tissue and organ were nourished with the same quantity of blood? The heart would have to pump more blood than it does now,[122] and such a tempo would soon

In the event of any kind of accident, the brain—as the main center in the body—is one of the organs most in need of protection. The blood vessels in our bodies act in the knowledge of the brain's priority. If the amount of blood reaching the brain declines, both the brain's own blood vessels and other blood vessels take precautionary measures. The brain blood vessels enlarge or constrict, and other blood vessels elsewhere in the body slow the flow of blood through them in order to divert more to this important organ.

exhaust it. When climbing a mountain or engaging in strenuous sporting activity, for instance, your body needs a higher level of oxygen. You begin breathing very rapidly, and your heart beats very fast, to meet your body's rising need for oxygen. All your tissues being nourished with the same amount of blood would lead you to experience a similar situation 24 hours a day.

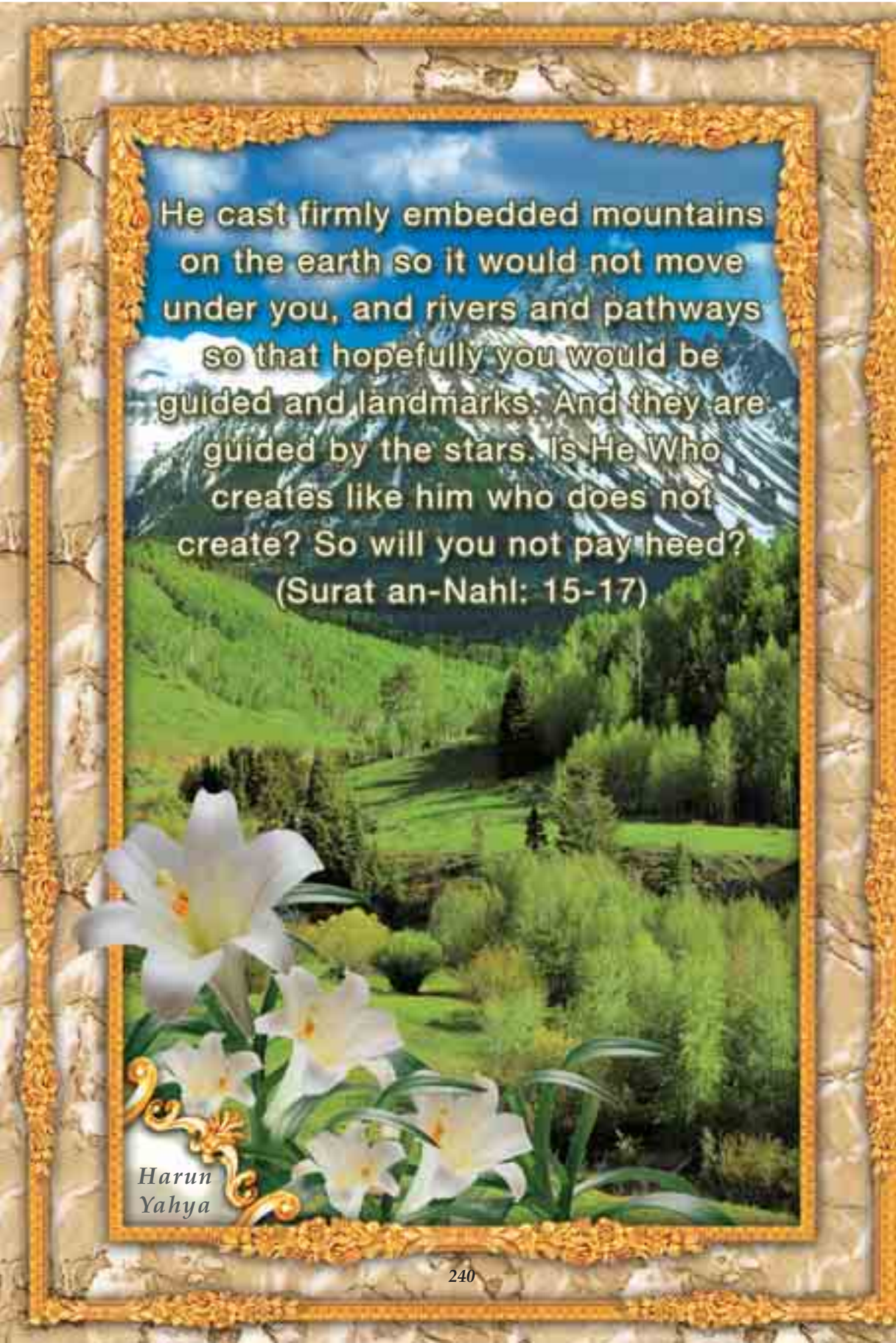
The blood vessels are created specially to achieve this perfect control. In cases of emergency, they know to take the appropriate and intelligent life-saving precautions. For example, a cold environment that causes body temperature to fall can be dangerous; the brain may suffer. Thanks to this superior ability of the blood vessels, however, a human being can withstand the cold. Upon encountering cold air, blood vessels in the fingers and toes immediately constrict as the first precautionary measure. Since vessels in the hands and feet are near the surface, they can cause the blood to cool. Their constriction prevents blood from cooling too much and the cooled blood from cooling down the heart and brain.

When met with extremely cold weather, your body's blood vessels may even sacrifice a finger or a toe to save you from freezing to death, and completely halt the flow of blood to that area. At the same time, the brain sends a message causing the muscles to shiver, causing the body temperature to rise.[123] When you go out in snowy weather, you will immediately feel these effects of your body taking these precautions.

The constriction and enlargement of the blood vessels is the result of an order given by the brain. By means of various nerves and hormones, it sends messages to the relevant blood vessels and it is accordingly determined which tissue needs what. For example, when you feel very hot or when you are embarrassed, signals from your nerves reach the muscle cells within the walls of the arterioles. As a result of their relaxation, the blood flow increases and your face flushes.[124]

In this regard, the capillaries behave independently. They permit the flow of blood in the light of requirements, halting it when necessary. For example, the flow of blood to your small intestine accelerates after you eat. But when you are resting, the blood flow to your muscles is cut down. In fact, you do not have enough blood to fill all the capillaries in your body. If all the capillaries were open at the same time, there wouldn't be sufficient blood for the brain, and you would soon faint. If that situation were prolonged, it could result by brain damage.[125]

The capillaries' ability to control the flow of blood directly is a very important property in terms of keeping the body temperature stable. The capillaries halting the flow of blood in cold weather, especially in regions close to the skin, helps limit loss of heat.[126]


He cast firmly embedded mountains on the earth so it would not move under you, and rivers and pathways so that hopefully you would be guided and landmarks. And they are guided by the stars. Is He Who creates like him who does not create? So will you not pay heed?
(Surat an-Nahl: 15-17)
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Outside heat also is as crucial as cold in maintaining internal body temperature. When it is a hot day, the blood vessels in the body use the exact opposite method: Blood vessels close to the skin dilate. The blood rushes to areas close to the surface, and your face thus turns a reddish color. The heat in the blood warms your skin, and its heat is dissipated into the air. In this way, the body's internal temperature remains at an even, normal level.

In view of these many magnificent precautions, every rational person can see a magnificent order and complete perfection that surpasses human wisdom. Anyone who seeks an explanation for all this will realize the absolute existence and dominion of God.

These perfections, which have been described since the start, show that the mighty presence of God is everywhere, and to help us be aware of that fact, His splendid works exist in our own bodies as well. People who fail—or refuse—to see these manifest truths will realize the extent of their error in the Hereafter. For ignoring the countless proofs God has shown them, and even for seeking other explanations for what they are shown, the response may be a very great one. God has prepared an eternal life in Hell for those who knowingly deny Him.

All who use their intellect must consider the existence of the Hereafter and seriously fear the torments of Hell. In one verse, God reveals the situation of unbelievers in the Hereafter:

And [when] the True Promise is very close, the eyes of those who disbelieved will be transfixed: "Alas for us! We were unmindful of this! No, rather we were definitely wrongdoers." (Surat al-Anbiya': 97)

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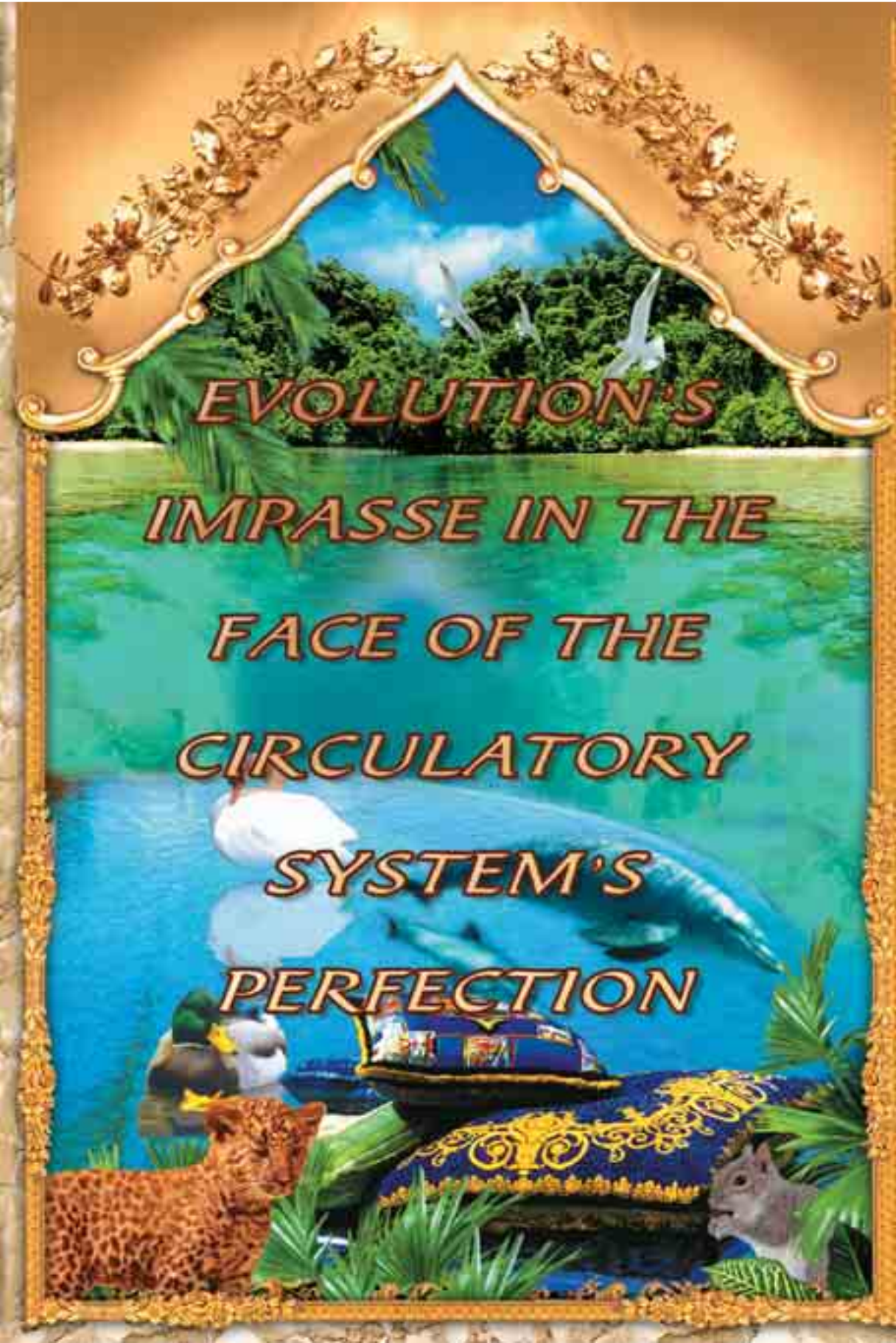
EVOLUTION'S
IMPASSE IN THE
FACE OF THE
CIRCULATORY
SYSTEM'S
PERFECTION

No doubt, the red fluid known as blood in the human body was known since the dawn of history. Only later, however, was it realized that it traveled through the body and was not immobile. This discovery became possible only in the Middle Ages, when Islamic nations led the world in the fields of science, art and thought. The Muslim physician Ibn al-Nafis first described the circulation of the blood in detail. The Europeans learned of this only in the first half of the 17th century through the discoveries made by William Harvey. In his book, *Exercitatio Anatomica de Motu Cordis et Sanguinis in Animalibus* ("An Anatomical Exercise on the Motion of the Heart and Blood in Animals"), Harvey proved that the heart pumped blood all through the body.

If you had never been aware of the existence of the blood flowing in your body and then suddenly discovered it one day, you too would be surprised. The first fact to amaze you would be the prevailing red color just beneath your skin. When you learned that the liquid causing it was constantly flowing at high speed, you would be even more astonished. When scratched or nicked, you would watch how blood flowed to the surface, soon stopped and coagulated by itself. And when the region which it flowed to assumed a totally different appearance by forming a scab your amazement would increase. You would then begin to wonder how and why this special fluid had been placed inside your body.

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When you examined its workings in some detail, you would realize that your body could not survive without blood and perhaps more interestingly, *the blood could not survive without your body*. Therefore, whatever experiments you did in the laboratory where you examined it, you would never be able to learn the full details of this perfect fluid.

This is also true for the present. Scientists have still not fully unraveled all of blood's details and functions. For now, in fact, this does not seem possible, because blood remains alive only inside the human body. Soon after blood leaves the veins and arteries, it literally dies and starts coagulating. The reason we have been able to obtain general information about the blood is

Blood coagulates when it leaves the body and quickly loses its animated properties, as if it were now dead. That is why scientists are unable to investigate all of blood's features in the laboratory, and why the world of science is still a long way from making a blood-like fluid.

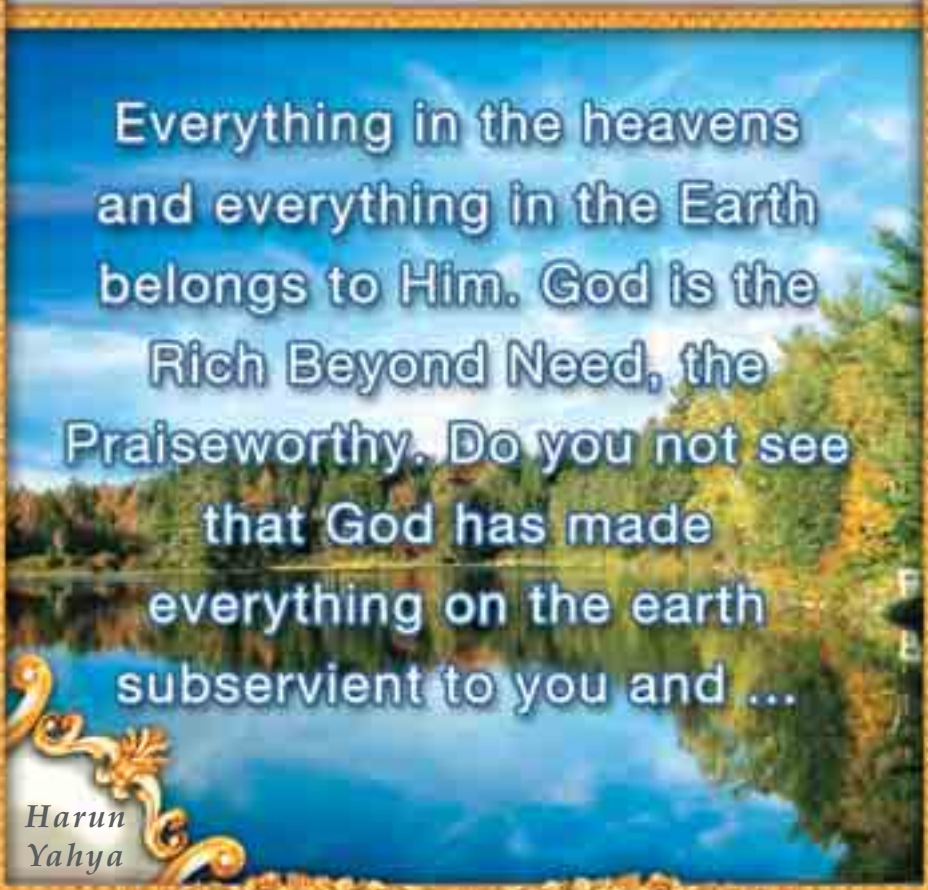
that the cells comprising it can be extracted and examined separately. Scientists can preserve the clear plasma from which the cells have been removed, but this requires various processes. It is not known whether the cells, which have a certain life and way of moving under the microscope, display the same features inside the human body. Therefore, countless scientists working in the world's most highly advanced laboratories and with the most highly developed equipment, have been unable to imitate blood's workings. Present research is aimed at producing an articial fluid that can at least transport oxygen.

All these details have been provided to help people consider this subject. Some open or covert forms of indoctrination given by various media organs or educational institutions or by means of "popular culture" insist on the preconception of evolution. The proponents of evolution are unwilling that people should think too much about the subject. They offer accounts whose scientific guise is actually rather funny, and adorn them with a few chemical formulae. When they add various conjectures or even forgeries, what emerges is the theory of evolution, which is taken exceptionally seriously in scientific circles, with conferences even being held on the subject.

What they are actually trying to say beneath all that great fuss is this: This magnificent universe, the flawless human body, all the different species of animals and plants—in short, everything that exists—came about *by chance*. So illogical and shameful is this claim that even some scientists no longer state it openly, but seek to gloss over it by using scientific terminology.

The reason they don't want people to consider the subject too much is this: When one examines any-

thing on Earth in any detail, one can easily see how terribly erroneous the theory of evolution really is. Any biological system you may encounter is so detailed and rational that far from it being brought into existence by chance, the slightest deviance would clearly disrupt its functioning. The object analyzed does not need to be the bodily mechanism of a living creature or the complex structure of a plant. A single protein's amino acid sequence is enough to show that life has been created. Recall the general outline of the circulatory system as detailed in this book. The theory of evolution is unable explain



the origin of even a single macromolecule from the innumerable components of this detailed, exceedingly complex and vital mechanism. It is impossible to ascribe to chance because even a single accidental occurrence will totally disrupt the whole magnificent system. This fact was admitted in the pro-Darwinian Turkish magazine *Bilim ve Teknik* ("Science and Technology"):

> *Everything that takes place in the blood is exceedingly complex and interrelated. Everything, right down to the smallest detail, has been arranged in a flawless manner. So perfect is the functioning in the*

blood that the slightest imperfection can have very serious consequences.[127]

Blood is alive only in the body, and the body can live only with blood. Therefore, blood must have come into being neither before nor after the body, but at exactly the same time—in other words, together with the first living thing that possessed a circulatory system. The heart must also have come into being at that same time, since the heart and blood vessels cannot function haphazardly. They also need a route, so the blood vessels must also have been laid out at that time.

In the light of evolutionists' claims, one would have to accept that the first organisms on Earth in possession of a blood circulatory system emerged by chance. Actually, the fossil record shows that organisms with this feature emerged during the Cambrian period, together with many other complex life forms. We know that most Cambrian creatures possessed a circulatory system. In earlier fossil strata, there are only single-celled and very simple multi-celled organisms, and the theory of evolution has no answer to the question of how blood circulation emerged suddenly in the Cambrian period, with no antecedents before it. In order for the body of a multi-celled organism to survive, all the many millions of cells that comprise it must be kept alive one by one. Therefore, blood vessels and a perfect distribution network linked to every cell must have existed together in flawless form from the moment that body began to live. Furthermore, the presence of that system is useless in the absence of respiratory mechanisms to take on oxygen, a brain to issue directives, bone marrow to produce blood, blood vessels to transport the blood—and in short, all the other mechanisms in the body.

It is impossible for any single element in this flawless organization to come into being at a later stage, while the others waited for it to emerge in order to function properly. It is of course illogical to expect blood vessels to come into being *by chance* and then wait for millions of years for blood to flow through them, or for the blood itself to wait, serving no purpose at all, until a pump to set it in motion comes into being. Yet that is just what the proponents of the theory of evolution claim.

We need to ask evolutionists: Why is it impossible to artificially replicate blood, which supposedly came into being by

chance? Why cannot this production—so easily and flawlessly carried out by coincidences in their view—be carried out by specialist scientists using 21st-century technology? How could those coincidences, random developments in a natural environment, develop blood in such a way that it can only survive only inside a living body? Which coincidence distributes their duties to the cells, sets out a particular course for them, or directs the heart muscles to contract? Every one of these "coincidences" must necessarily have added something useful to the mechanism composing the circulatory system—because even if a perfect, error-free system does emerge, one mistaken intervention will be sufficient to ruin that entire system. So, is it possible to describe as chance all these phenomena, full of obvious consciousness?

There is consciousness in every part and every detail in the system. Human beings discovered the details of this consciousness just in the last hundred years, and only in general terms. It is Almighty God, He Who is superior to all, Who created all these.

The sole reason of evolutionists' denying the truth is that they have conditioned themselves to reject evidence for the existence of God. In fact, it is impossible for a scientist who observes all this complexity in life to believe that everything could have come into being by chance. The only reason that evolutionists continue to defend this theory, which lacks any scientific basis, is to ignore God's flawless creation. They have closed their eyes to the facts of creation so clearly exhibited in every detail on Earth, and have adopted blind chance as their deity.

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Some proponents of evolution realize their big mistake and have had to accept everything as the result of *creation*. The fact of creation is everywhere we look. God has created such a perfect universe that every new discovery, every new scientific detail encountered, reveals His absolute presence. All these things in nature are the incomparable works of God, the Creator. Anyone who sees and appreciates this will have comprehended the greatest secret in the universe, and will understand the reason for his own creation and that of other human beings. And with every new evidence he sees, he will draw closer to God.

Anyone who denies this truth, in the face of all the evidence, will waste his energies in this world and be rewarded with terrible suffering in the Hereafter. God reveals this in a verse:

Those who respond to their Lord will receive the best. But as for those who do not respond to Him, even if they owned everything on the Earth and the same again with it, they would offer it as a ransom. They will receive an evil Reckoning. Their shelter will be Hell. What an evil resting-place! (Surat ar-Ra'd, 18)

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