BODY BY design

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Dedicated to Jayne, Earl, and Barbara Gillen

All scripture quotations taken from the
King James (Authorized) Version of the Bible.

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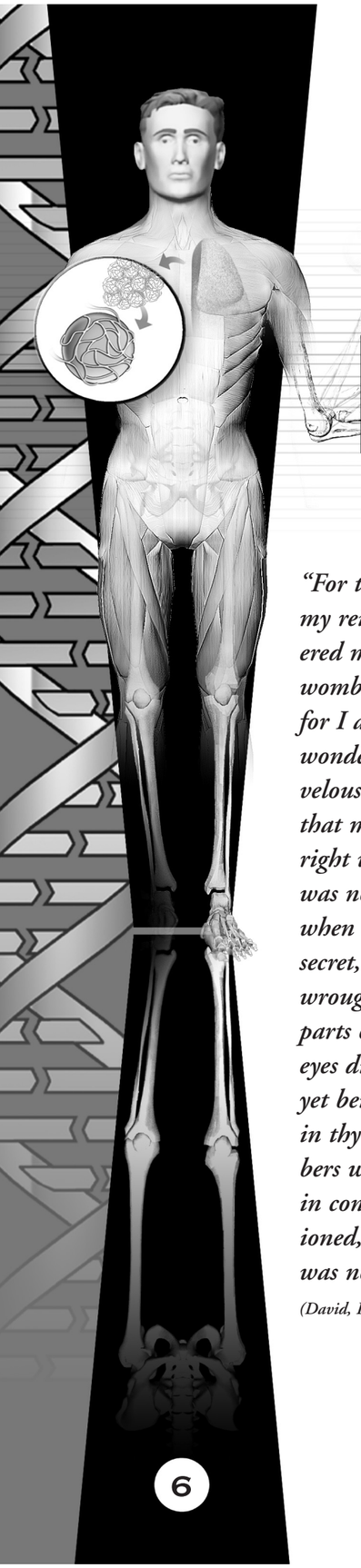


Recognizing Design in the Human Body

Chapter 1

"For thou hast possessed my reins: thou hast covered me in my mother's womb. I will praise thee; for I am fearfully and wonderfully made: marvelous are thy works; and that my soul knoweth right well. My substance was not hid from thee, when I was made in secret, and curiously wrought in the lowest parts of the earth. Thine eyes did see my substance, yet being unperfect; and in thy book, all my members were written, which in continuance were fashioned, when as yet there was none of them"

(David, Ps. 139:13–16).

The powerful, unceasing beating of the heart, the intricacy of blood clotting, the complex, camera-like eye, the double helix pattern in DNA, and the skillful hand of a surgeon are all examples of intricate designs found in the human body. The origin of these patterns is a topic that has fascinated biologists since the time of the ancient Greeks. It was not until the time of Vesalius (1514–64), however, that the dissection of cadavers was allowed in the study of human anatomy. It was also during this era that the scientific method was first used by William Harvey (1578–1657) in human physiology, and that good biology began to demand proof from experiments, not just "logical" and speculative thinking. Beginning with the **Reformation** time period (and later during the **Renaissance**) man began to really understand "wisdom of the inward parts" and to seek to understand products of the Creator's design and plan for the human body. In those days, many explorers of the human body began "*thinking God's thoughts after Him*."

The Webster's dictionary defines **design** as a plan, a scheme, a project, or a purpose with intention or aim. Today, many are asking whether these observed designs are the product of evolution or if they are the "fingerprints" of a master creator. Many biologists view man as the product of cosmic evolution from some hominid ancestor. Still other biologists question this naturalistic model of human descent because there is a unique plan and pattern to the human body. Today, many biologists are reconsidering design and are seeing *Homo sapiens* (literally, man who is wise) as the pinnacle of design because of his spectacular cell biology, anatomy, and physiology.

The Fabrica View of the Human Body

Thou didst form me from my mother's womb.

The Psalmist, in his song of praise to God, is beautifully picturing the weaving together of a human being within the womb. However, the Psalmist had no idea of how scientifically true his picture was. In the Old Testament era, man had never heard of DNA or RNA, the helical and symmetrical molecules that are woven together to produce the blueprint of life. Yet with great accuracy, the Psalmist depicts the skillful fabric of the human body.

During the Great Reformation, a Belgian anatomist and physician began to unlock the mysteries of the human body. Andreas Vesalius (figure 1.1), born in Brussels in 1514, changed anatomy forever. Vesalius, a devout Roman Catholic, understood there to be a Master Craftsman behind the fabric design in the human body. During the 1530s, Vesalius developed a great interest in anatomy by studying the body parts of human cadavers. After completing a medical degree, he taught young medical students by performing dissections as he lectured. Vesalius did not follow the traditional approach of merely reading from books as he taught anatomy. Ancient Roman physicians such as Galen had studied the body parts by dissecting animals. Vesalius, however, turned to human corpses for his dissections. His radical methods enabled him to write the text *De Humani Corporis Fabrica* (The Fabric of the Human Body), the most accurate and comprehensive book on human anatomy ever written in his time. The seven-volume work was completely illustrated with handmade engravings by Vesalius himself. These diagrams vividly proved the theme of a divine designer in the interwoven human body.

Because of his great work, Vesalius was appointed as royal physician to Phillip II in Madrid. In 1564, Vesalius died in a shipwreck after a trip to the Holy Land, but he lived on in his masterpiece, *Fabrica*. This book boldly challenged hundreds of Galen's teachings on how the body operates. Many traditional anatomists attacked Vesalius' book, but failed in every attempt. No matter where the opponents looked, they were rebuffed with the accuracy of details he used in describing the human body and the vivid drawings depicting the interwoven designs. Both text and drawing could be verified by dissection of human cadavers.

Everywhere a scientist studies in the human body, he is confronted with a designer behind the seamlessly interwoven design of the lymphatic, immune, circulatory, respiratory, and digestive systems. Like the idea in Vesalius' *Fabrica*, many body systems illustrate the blueprint of a divine weaver, craftsman, or artificer. The interwoven complexity, along with the organs' intricacies, defies chance. The infinitely low probability of macroevolution occurring by mutations and selection points to an intelligent designer. There must have been a Creator to make such a beautiful fabric of the body systems, all originating from a microscopic blueprint called DNA.

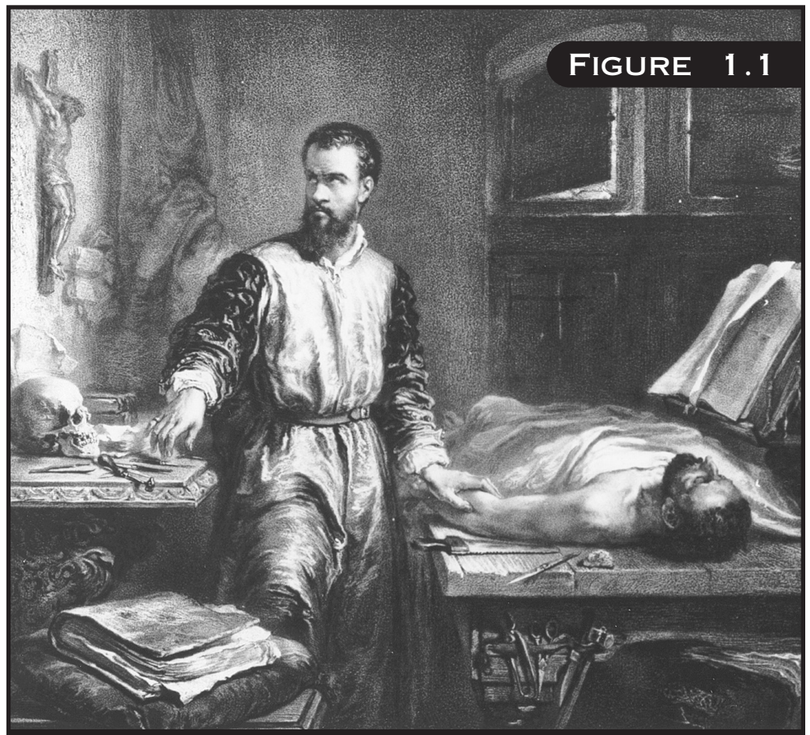


Figure 1.1

Andreas Vesalius, a devout Roman Catholic, understood that there was a Master Craftsman behind the fabric-like design in the human body.

The intertwining design of the human body will be shown in the manual by the fabric of DNA, embryonic development, muscle construction, alveoli of lungs, convoluted tubules of kidneys, capillaries of lymphatic and circulatory systems, intertwining nature of heart chambers, and many other body systems.

Book Objectives

The purpose of this book is to:

- Describe the designed structures and purposeful functions for each of the 11 systems in the human body;
- Explain selective in-depth explorations for interwoven components and body parts for each system;
- Compare and contrast the interwoven design observed in cloth/fabric with the patterns seen in each system of the human body;
- Provide examples of disease in each of the body systems from a clinical and/or creation perspective; and
- Explain the historical Reformation viewpoint of anatomy and physiology.

We begin with Vesalius, Father of Modern Anatomy, and trace the creation model of the human body through the year 2000, including the technology-based research projects of today.

Many of the terms that are useful in discussing such a plan can be found in the glossary.

The complexity of the human body is direct evidence against macroevolution. All the interwoven parts of the body point to an intelligent Creator. In the early 1990s, Dr. Charles Thaxton argued for the intelligent design of the human body. His argument is called the principle of uniform experience. To illustrate the complex nature of this principle, one needs to look at the formation of a beautiful tapestry in a weaver's loom. First, a fabric designer needs to sit down and design the blueprint for the tapestry. She needs to decide which colors to use and what type of pattern she will use the colors in. The seamstress must also decide what type of fabric she will use for the tapestry. She cannot randomly pick colors and fabrics, for they must coordinate and complement each other. Next, the weaver must decide how to mix and intertwine the strands of thread. On a simple loom, she will weave the secondary threads under and over the primary threads. Each individual thread meshes tightly against the next thread. Slowly, carefully, the designer weaves together her beautiful picture, one thread at a time. When the seamstress has finished her picture, she releases it from the loom.

All customers who look at the tapestry see only the one complete fabric. However, if one would look close enough, he could see all the individual threads seamlessly woven together. Anyone looking at the rich tapestry and the vibrant colors would immediately praise the designer, because they realize that only a Master Designer could produce such a magnificent work of art. Yet, the very same people will turn around and claim that the complex human body happened by chance. The body, however, is woven together just like a tapestry. For example, look at the interwoven complexity of a single skeletal muscle. When one initially glances at a muscle, he sees a tough, translucent mass of tissue. Under the microscope, however, the amazing interwoven design manifests itself. Each muscle is composed of muscle fiber bundles (figure 1.5). In each fiber, many myofibrils and nuclei are enclosed within a common sarcolemma. Each myofibril contains numerous sarcomeres, arranged end to end in a single file. There are millions of sarcomeres in a single muscle with each overlapping the next one in a long string. These sarcomeres have two parts to them. Thin actin filaments surround a thick myosin filament. When the actin filaments contract across the myosin filament, the muscle contracts. The muscle will not move until every sarcomere is contracting the same way. Therefore, nerves repeat the message to other neighboring muscle fibers.

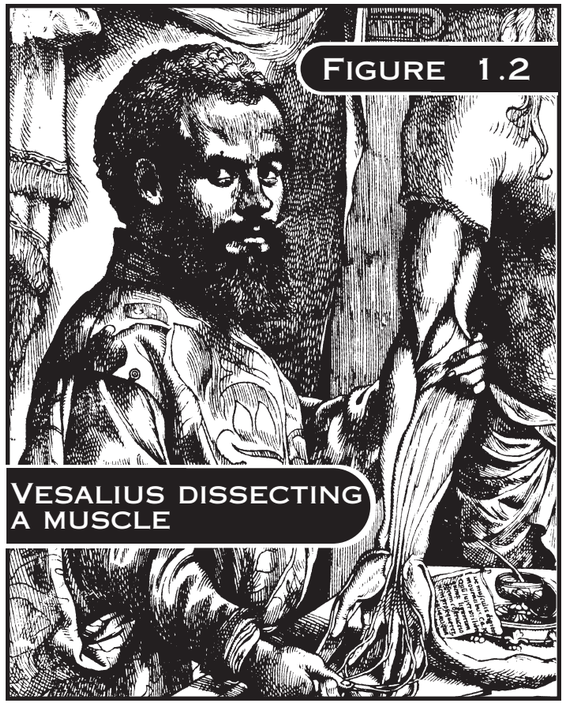


Figure 1.2

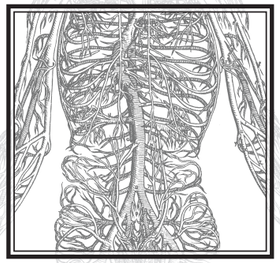
Vesalius dissecting a muscle

All of these individual parts are needed just to make one single muscle contract. Yet, there are nearly 700 muscles in the human body. Indeed, the complexity of the human muscle must have come from the blueprint of a master weaver. Just as one would acknowledge the intelligent causation of a tapestry, so also must one acknowledge the intelligent designer of the human body. This chain of logic, which compares the making of a tapestry to the formation of a human muscle, illustrates the principle of uniform experience (figure 1.3).

The Human Body and Its Design

What a piece of work is a man! How noble in reason,
how infinite in faculty in form and moving how express
and admirable in action like an angel,
in apprehension how like a god!
Shakespeare

Awesome, incredible, or ingenious are some of the adjectives that men through the ages have used to describe the order found in the human body. The splendor of the human body can only be described in superlative terms! When one considers the movement in the hand of a concert pianist, the thought processes in the brain of a heart surgeon, the eye focus required of a seamstress, and the muscle coordination that propels a world-class gymnast, it is difficult to imagine this body plan has happened by chance. A naturalistic explanation, alone cannot account for the incredible complexity and optimal integration in human anatomy and physiology. All these life processes require precise movement, coordination, and communication among the body's cells.



The human body consists of 11 organ systems, four basic body tissues, and dozens of different specialized cells. The human body is mostly made up of an estimated 30 to 100 trillion cells, with most estimates counting over 75 trillion cells. This is quite a range. Perhaps this range is so vast because of the diversity of human sizes from Billy Barney, a famous circus midget, to Hakeem Olajuwon and Shaquille O'Neil (NBA stars). Most of these cells can be seen with a light microscope. Some 100 million are red blood cells (RBC) and several hundred million are nerve cells. The human body is truly a highly organized and coordinated system!

Human Body Systems

The Bible calls the human body a "temple" (1 Cor. 3:16). If the body is a temple, it is surely the most elaborate one ever wrought. It is a marvel of architecture, complete with domes, windows, arches, and thousands of miles of intricate passageways. But this is no placid, subdued temple. It is far from it. Every cell of the body, every fiber of its being blazes with activity. The human body is a bustling place, even when asleep. It is always building, renovating, reproducing, and growing. It converts one energy form into another. It sends and receives messages, it fends off intruders, and it performs the most amazing balancing acts.

This human temple is constructed according to levels of organization that increase in size and complexity. Cells form the basic structural and functional units of life; they are the smallest living parts of our bodies. The most complex level is the systems level. Anatomical evidence of design can be seen in every level from the simplest to the most complex levels of organization.

Humans are complex creatures; they require many levels of organization to keep things running properly. Groups of similar **cells** come together to form **tissues**; tissues unite to form **organs**. Two or more organs, along with their associated structures, join forces to perform certain vital functions, such as digestion or reproduction. This group of organs working together is called a **system**. The complete creature comprises various systems. God's pride (declaring it very good), the human body, is composed of 11 distinct but interrelated systems. They all seem to possess an interwoven fabric design, bearing the signature of a master craftsman (Eph. 2:10).

From a biological standpoint, the ultimate goals underlying all the body's internal activities are survival and reproduction. The Bible tells us that we are to be good stewards of the temple God has given us and that man is to be fruitful (for survival) and multiply (for reproduction). With our large, sophisticated brains, we humans can set many goals for ourselves, but our bodies are run largely by systems designed to ensure that we survive and reproduce.

The human body may be considered to have 11 systems (table 1.1), each with its own job but all highly interdependent. The main job of the skeletal system is to protect our inward parts and to support us. Muscles help us move and respond to external stimuli. The task of the nervous and endocrine systems are to maintain order among the body's trillions of cells. Both the digestive and the respiratory systems provide raw materials for our daily lives and for growth and both carry off wastes. The circulatory system transports nutrient- and oxygen-rich blood throughout the body. The excretory system rids us of liquid waste, while the nervous system interprets and responds to stimuli from outside our bodies as well as from those inside. The job of the reproductive system is to ensure the survival of mankind. The integumentary system holds the whole package together and helps protect us from invading microbes. It works with the major systems that marshal protection against

TABLE 1.1 Organ Systems with their Main Components and Main Functions

ORGAN SYSTEM	DESIGNED STRUCTURE	PURPOSEFUL FUNCTION	INTERWOVEN COMPONENTS
1. DIGESTIVE	Mouth, pharynx, esophagus, stomach, intestines, rectum, anus, liver, pancreas, and gall bladder	Food processing (ingestion, digestion, absorption, elimination)	villi: capillaries & lacteal
2. CIRCULATORY	Heart, blood vessels, blood	Internal distribution of materials	twisting (helical) inside arteries & veins; capillary junctions with each body system
3. RESPIRATORY	Lungs, trachea, other breathing tubes	Gas exchange (uptake of oxygen)	alveolus, capillaries
4. IMMUNE AND LYMPHATIC *	Bone marrow, lymph nodes, thymus, spleen, lymph vessels, white blood cells	Body defense (fighting infections and cancer)	lymphatic capillaries, spleen, thymus
5. EXCRETORY	Kidneys, uterus, urinary bladder, and urethra	Disposal of metabolic wastes; regulation of osmotic balance of blood	reticular fibers in spleen, lymph nodes
6. ENDOCRINE	Pituitary, thyroid, pancreas	Coordination of body activities between hormone-secreting glands (e.g. digestion, metabolism)	juxtamedullary nephron with pertibular capillaries
7. REPRODUCTIVE	Ovaries, testes, and associated organs (egg and sperm)	Procreation, physical intimacy	nerve/endocrine junction in pituitary stalk
8. NERVOUS	Brain, spinal cord, nerves	Coordination of body activities; sensory organs detection of stimuli	umbilical cord, uterine blood supply, double helix in germ cells
9. INTEGUMENTARY	Skin and its derivatives (e.g. hair, claws, skin glands)	Protection against mechanical injury, infection, drying out	Seminiferous tubules, epididymis
10. SKELETAL	Skeleton (bones, ligaments, cartilage)	Body support, protection of internal organs	astrocytes and various neuroglial cells
11. MUSCULAR	Skeletal muscles	Movement, locomotion	cauda equina, plexuses, pain network
			dermis glands, hair, and nerve network
			osteon (haversian system in compact bone)
			sarcoplasmic reticulum, with T-tubules

*** Anatomical structures in our body's defense system are collectively known as the *lymphatic system* and the functional body defenses system are known as the *immune system*.**

germs and toxins. These body defenses include the immune system and the lymphatic system.

If one system fails, the others are affected, either directly or indirectly. Let us explore how these 11 systems do their jobs in the chapters ahead, for herein lies the wonder that differentiates our living bodies from even the most exquisite temple.

Human Body as a Machine

Another classic word picture used to describe the human body is one that envisions it as a complex machine. The body and a machine both perform work. This analogy is not new. Renaissance scholars, including the famous artist and scientist Leonardo da Vinci, used it. At the close of the 15th century, Leonardo da Vinci made the most comprehensive study of the human body, yet he saw neither superfluous nor defective structure in man. In fact, he described human anatomy as one of beauty and complexity. In addition, he made sketches of the body in a study of proportions, and compared them with the most sophisticated machines of his time. Because the body was so masterfully engineered like a "machine," it has been the subject of many artists' works through the centuries.

This machine analogy is still applicable today. Each part of the body has its own job. The parts work together to keep the body alive, much as the parts of an automobile work together to make it run. The skin, for example, protects the body as paint protects the metal on a car. Food serves as fuel for the body as gasoline powers a car engine. The human body wears out and breaks down if not properly maintained. If a machine requires a blueprint and an architect, how much more does the plan of the human body logically demand that it have a Maker?

Remember, however, that the human body is not as simple as a machine made by people. If a car breaks down, its broken parts can be replaced. If some parts of the body wear out and break down completely, they cannot so easily be replaced to make the body as good as new. Many parts, such as the hair and outer layers of skin, however, are continually being replaced as older portions die and fall off. Unlike a machine, the body can heal itself, within limits, as illustrated in the case of a broken bone that forms a collar and a wound that disappears as the tissue is restored.

Basic Themes of Human Physiology

There are basic principles, or themes, that can be observed in all 11 of the human body systems. These themes include 1) relationship of structure to function; 2) steady state of metabolism, or homeostasis; 3) interdependence among body parts; 4) short-term physiological adaptation; 5) maintenance of boundaries; and 6) the triple scheme of order, organization, and integration. These themes are widely acknowledged by physiologists and are consistent with a creation perspective of the human body. In fact, I believe each of these themes are physiological evidences for a creation model of the human body.

The **correlation of structure and function** can be explained by stating that, in general, the physical form of human tissue, organ, or system is related to its function. Two examples of this are 1) the composition of bone that makes it both strong and relatively light to handle the body's weight, and 2) the longitudinal separation in the heart that keeps unoxygenated from oxygenated blood. Both are exquisite demonstrations of form being related to function.

The human body maintains itself in equilibrium, a steady state known as **homeostasis**. This concept is based upon feedback that prevents small changes from becoming too large and harmful. Changes occur between internal and external environments, and between interstitial fluid (the fluid between our cells) and intracellular fluid. In this way the body stays in balance, but not everyone's balance is exactly the same. "Thermostat wars" inside the house frequently happen when family members are at home — one member is hot and the other is cold. Clearly, the body's hypothalamus or body "thermostat" has a unique best setting. The body will regulate its temperature by a negative feedback mechanism by either shivering to warm the body when it is cold or sweating to cool the body when it is hot.

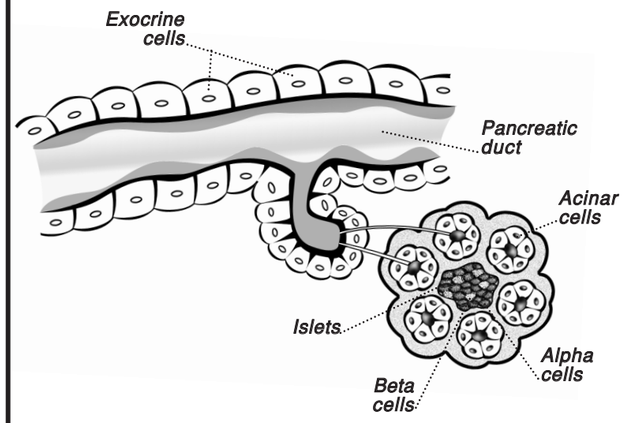
Another example of homeostasis and negative feedback is glucose regulation by insulin and glucagon. The pancreas is considered both an exocrine and endocrine gland. The endocrine function of the pancreas secreting insulin in the blood is controlled by the amount of glucose in the blood. The pancreatic cells that control blood glucose levels are called Islets of Langerhans. Insulin and glucagon work as a check and balance system regulating the body's blood glucose level. Insulin is antagonistic to glucose. It decreases the blood glucose concentration by accelerating its movement out of the blood and through the cell membranes of the working cells. This topic will be explored in chapter 13.

As glucose enters the cells at a faster rate, the cells increase their metabolism of glucose. All sugary and starchy foods, such as bread, potatoes, and cakes, are broken down into glucose. In this form they can be absorbed by every cell in the body, including the cells in the liver, which store glucose in the form of glycogen. Cells absorb glucose and

generate ATP, using the energy released from the sugar.

ATP is generated in the cell's mitochondria, resulting in energy storage and the production of carbon dioxide and water as byproducts. This aerobic process is the body's principle source of energy and it cannot take place without insulin. One type of diabetes occurs when the pancreas fails to secrete enough insulin and so fails to regulate the glucose concentration in the blood. The normal glucose level for an average person is about 80 to 120 milligrams of glucose in every 100 milliliters of blood. If the beta cells of the pancreas secrete too little insulin, an excess of glucose collects in the bloodstream causing diabetes mellitus, the most common disorder of the endocrine system.

FIGURE 1.3



CELLS OF THE PANCREAS: ISLET CELLS (CENTER), AND ACINAR CELLS (PERIPHERAL REGIONS SURROUNDING THE ISLET CELLS)

Many early anatomists believed that body parts share a common thread uniting them; they are **interdependent with each other.** These early workers noted that the body is one unit, though it is made up of many different types of cells and tissues. They all form one body. Related terms that other scientists have used to describe this phenomenon of interdependence include an **adaptation package, cell team, compound traits, emergent properties, interwoven components, irreducible complexity, molecular team,** and **synergism**. This resulting condition of interdependent body parts working together is synergistic such that the sum of their action is greater than the addition of separate, individual actions.

Two examples of the marvelous advantage resulting from this cooperation at all levels from the molecular to the systematic are 1) the amazing interdependence of many parts for focusing the lens in the human eye, and 2) the irreducible complexity involved in the cascade (meaning one effect must occur in order for the next level of effect to happen) of biochemical reactions required for blood clotting.

Adaptation allows living cells to adjust to change in the external environment. Short-term change is facilitated by physiological adaptation. An example of this would be an adjustment of oxygen level in our bloodstream as we change altitude. Oxygen pressure in the atmosphere decreases at higher altitudes. The athlete who is conditioned at sea level won't breathe as efficiently at high altitude stadiums compared with those who train at higher altitudes. If the body remains living and training at higher altitudes over a period of months, however, then it will physiologically adapt to this altitude by increasing the level of a hormone called **erythropoietin**. This hormone increases the number of red blood cells and, in turn, the oxygen available to body tissues also increases. This adaptation gives greater "wind" to the athlete competing in "mountain" arenas.

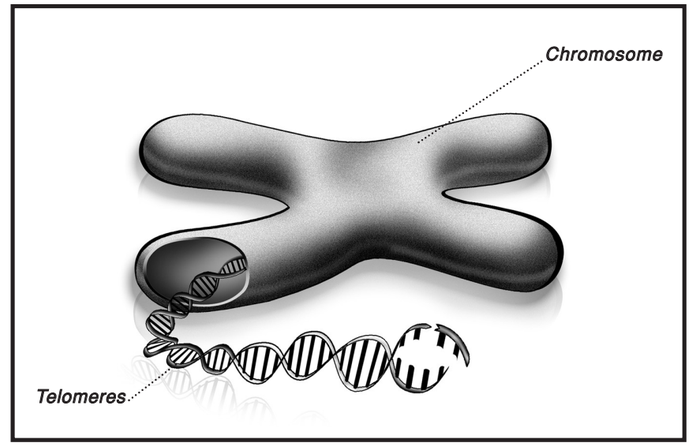
Every living organism must be able to **maintain its boundaries** so that its inside structures remain distinct from its outside chemical environments. Every human body cell is surrounded by a cell membrane that encases its contents and allows needed substances to enter while restricting the entry of potentially damaging or unnecessary substances. Additionally, the integumentary system, or skin, encloses the whole body. The integumentary system protects internal organs from drying out, from bacterial invasion, and from the damaging effects of an unbelievable number of chemical substances and physical factors in the external environment.

Finally, the triple theme of **order, organization, and integration** can be clearly seen in many of the human body systems. These themes will be discussed most in chapter 11 on the nervous system. The levels of organization from least complex to most complex are molecules, cells, tissues, organs, organ systems, and organisms. A plan and purpose can be seen through the structure and function of an information system, leading us to believe the parts of animal and human bodies are the work of an intelligent designer. This argument may apply from the molecular level to the gross anatomical level.

DESIGN FOCUS 1.1

AGING THEORY: WHY DOES THE BODY WEAR OUT?

One of the topics of great interest to cell biologists and physicians is **aging**. Why do we age and are there limits to how long we live? These are just two of the questions that scientists and theologians alike are asking. Evolutionists believe we can extend human life longer and longer if only we have the technology. Yet, the Bible does seem to indicate that we will all die and that there are upper limits to how long we may live. On the other hand, creation scientists believe there was a time in human history that man could live to great ages, even into the 900-year life span. (Most evolutionists scoff at such an idea.) This was prior to the great flood of Noah's day. In this age, however, a median age between 70 and 80 is most common, with an upper limit of about 130 years.



Why do we age?

Cells in the human body will eventually wear out and die. It is enough to simply say that there are biological laws that dictate that all fixed structures will eventually wear out. This is true, but biological machinery has a built-in program that has the ability to repair itself. Human and animal cells don't keep dividing, repairing, and renewing our body parts forever. If worn-out cells could be replaced by newly manufactured ones, then none of your parts would wear out and you could live forever. You might die of an automobile accident or microbial infection, but you would not die of "old age." Our organs, however, do wear out. The cells within can multiply for a while, but not forever. After a finite number of times, they simply stop dividing and eventually die.

Cell biologists have found that ordinary cells will divide between 80 and 90 times. It appears that telomeres, on the tips of each chromosome, control the number of times a cell can reproduce. Every time the cell divides, it is as if a bead is snipped off, shortening the **telomere**. Once all the beads are gone, cell division can no longer take place. From then on, each cell runs down and new ones do not replaceit.Scientists discovered that DNA polmerase copies only part of the DNA sequence at the telomere. Each time a chromosome replicates it loses 50–100 DNA base pairs. Cell division ultimately stops when there is too much loss of DNA, and the cell dies because of damage it sustains in the course of aging. So even if you avoid any sort of fatal accident or disease, you will virtually succumb to organ failure and eventually death.

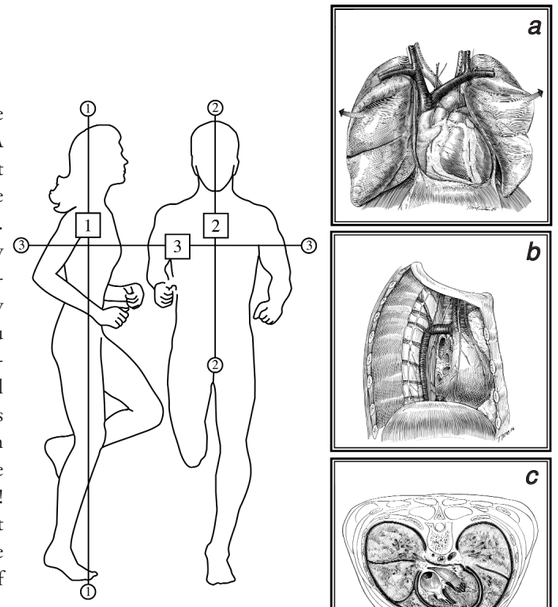
Events like infectious disease, accidents, mutations, and environmental toxins may speed the process of decay. A basic physical law, **entropy**, only accelerates disorder, and thus, aging. Unfortunately, the bad news is that we are all going to die. The good news is that those who trust in Jesus Christ, the Creator, for their lives, will someday get to "trade in" this old body for a new one. This new body will never grow old and die. And that is something to celebrate!

Figure Legends

Basic Terminology for Body by Design

Figure 1.4
Planes and Sections of the Human Body

The human body may also be described in terms of the planes, or imaginary flat surfaces, that pass through it. A sagittal plane is a plane that divides the body into right and left sides. A midsagittal (or medial) (2) passes through the midline of the body and divides the body into equal right and left sides. A frontal, or coronal plane (1), is a plane that divides the body into anterior (front) and posterior (back) portions. A transverse, or cross section (horizontal) (3) plane divides the body into superior (upper) and inferior (lower) planes. When you study body structure, you will often view it in a section, meaning that you look at only one surface of the three-dimensional structure. Figure 1.4 illustrates how three different sections were prepared from the three planes of reference. Each section can provide a different view of the thorax and its contents, the vital organs. The intelligent designer made our bodies in 3-D! A good anatomy student can learn to visualize a body part from any angle in his/her mind. This is a good skill to have when entering the health professions or biology. Practice of this skill will make you a better creation biologist.

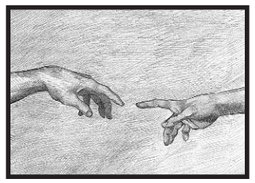


Planes • *1. Coronal 2. Midsagittal 3. Transverse*
Sections • a. *Coronal section b. Sagittal section c. Transverse section*

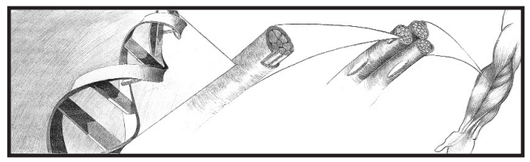
Figure 1.5
A Living Design: The Creation of a Human Muscle

This chain of logic that compares the making of a tapestry to the formation of a human muscle illustrates Dr. Thaxton's principle of uniform experience. The hands of God and Adam, DNA, myofibrils from a muscle fiber, a motor nerve unit, and muscles of the arm are pictured. All of these individual parts are needed just to make one single muscle contract. Yet, there are nearly 700 muscles in the human body. Indeed, the complexity of the human muscle must have come from the genetic blueprint of a Master Weaver. In everyday experience, one would never conclude that random chance events could produce a beautiful interwoven tapestry but that it is the end product of a weaver (intelligent designer). Logic demands that highly interwoven, intricate designs must also have an intelligent cause.

The Principle of Uniform Experience

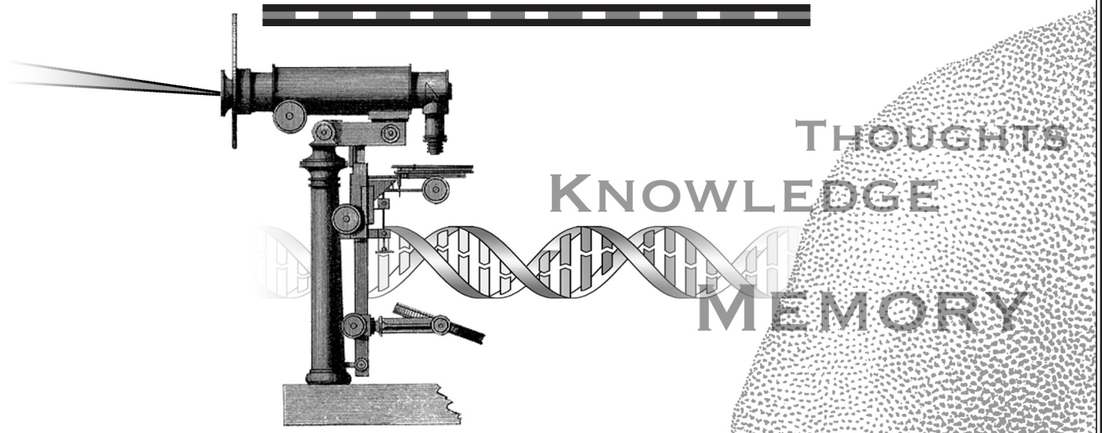


Creation of man



Genetic Blueprint for muscles • A myofibril • Bundle of muscle fibers • Muscles and tendons making up the arm

Check Your Understanding



Two Views of Origins

1. How can you recognize design in the human body?

2. List the 11 systems in the human body. Which of these systems is easiest to recognize? Hardest to recognize?

3. Name six physiological themes that are consistent with the concept of intelligent design. Which of these themes could be applied to all body systems?

4. How does the body reveal wisdom in the inward parts (Job 38:36)?

5. The anatomical masterpiece *De Humani Corporis Fabrica* was the work of Vesalius. Explain why he may have been a creationist in thinking. Also, discuss the impact of Vesalius on the advancement of anatomy and medicine when he based his human anatomy upon cadaver dissection rather than animal dissection.

6. Why must scientists be critical thinkers and sometimes oppose the popular thinking of the day? How does this apply to evolutionary dogma of this day?

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