

THE WARBLER

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ISSUE

138

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Dear Student, Artist, Thinker, Friend,

Anatomy is the branch of science concerned with the bodily structure of humans, animals, and other living organisms, especially as revealed by dissection and the separation of parts — wow. In previous issues of *The Warbler*, we have brought you information regarding body parts and structures of various animals, bugs, and even plants! In this issue we will introduce the history of the body, the make up of the body, how the study of anatomy first began, and many other things.

For instance, did you know that the human heart is actually located in the middle of the chest, not on the right or left side? And that the right-hand side of the human brain controls the left part of the body and the left side of the brain controls the right part of the body? We hope you find the rest of this issue to be as interesting as we did!

Tammy and the APAEP Team

WORDS INSIDE

FOUND INSIDE "HISTORY OF ANATOMY ..."

stagnates | to cease development, to stop moving

canonical | accepted by or according to the authority body of knowledge

FOUND INSIDE "THE FABRICATION OF ..."

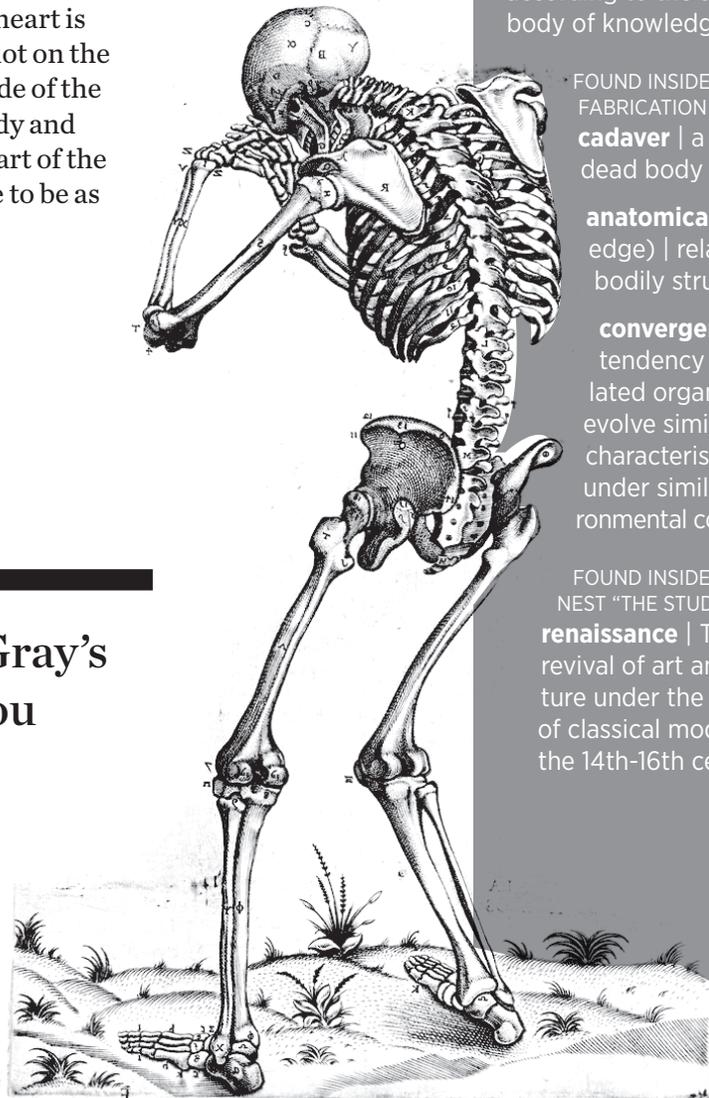
cadaver | a corpse, dead body

anatomical (knowledge) | relating to bodily structure

convergence | the tendency for unrelated organisms to evolve similar characteristics under similar environmental conditions

FOUND INSIDE RANDOM NEST "THE STUDY OF ..."

renaissance | The revival of art and literature under the influence of classical models in the 14th-16th centuries.



“Just because you watch ‘Gray’s Anatomy’ doesn’t mean you can do the operation.”

CHARLES BARKLEY // American basketball player and television sports analyst

Valverde de Amusco, Juan, approximately 1525-approximately 1588. Historia de la composicion del cuerpo humano. Italian (In Roma : Per Ant. Salamanca, et Antonio Lafrerj., 1560). ZAc 1 (Historical Medical Library of The College of Physicians of Philadelphia)

SCIENCE

History of Anatomy

FROM BODYWORLDS.COM

Anatomy is the study of the body. The actual term derives from the Greek verb “anatomēin,” which means “to cut open, to dissect.” It describes the most important process of this field of study — the opening up and dissecting of the body into its individual parts, and their description.

THE BEGINNINGS | 3RD CENTURY B.C.

Anatomy is the oldest scientific discipline of medicine. The first documented scientific dissections on the human body are carried out as early as the third century B.C. in Alexandria. At that time, anatomists explore anatomy through dissections of animals, primarily pigs and monkeys.

Claudius Galen (129-199) is the most prominent physician in Ancient Greece whose conclusions are purely based on the study of animals and whose faulty theories on human anatomy dominate and influence the medical science until the Renaissance, i.e. for over 1,000 years.

Although anatomy is not officially banned by the Church, social authorities reject the dissection of human corpses until the 12th and even 13th century.

This is why anatomical research stagnates. A change in attitude towards the teaching of anatomy only happens during the 13th and 14th century. However, teaching consists primarily of lectures from the canonical works of Galen—without verification through actual dissections.

MODERN AGE | 15TH-16TH CENTURY

Leonardo da Vinci (1452-1519), today’s most well-known Renaissance artist and scientist, performs many anatomical dissections of human corpses that form the basis for his famous, highly detailed anatomical sketches.

In medieval times, the body is seen as the frail housing of the soul. During the Renaissance, however, the human body is exalted for its beauty, and becomes the primary source of inspiration for artists of this epoch. For the sake of art, many Renaissance artists begin studying the human body. Leonardo da Vinci and Michelangelo do not only attend dissections performed by their medically trained friends, but rather pick up the scalpel themselves – with the aim to illustrate the body in all its natural splendor. Not only are body and muscles depicted in the most realistic way, but also the bone structure, the skeleton and the skin.

Leonardo da Vinci passionately studies the human body. Under cover of the night, he climbs cemetery walls, steals bodies, and drags them into his studio. There, he dissects them and uses them as models for his sculptures.

FROM THE 16TH CENTURY ONWARDS

The actual science of anatomy is founded during

the Renaissance with the work of anatomist and surgeon, Andreas Vesalius. Vesalius describes what he observes during the public dissection of human corpses. By dissecting human bodies, preparing muscles, tendons, and nerves down to the smallest detail, Vesalius is able to prove

more than 200 errors in Galen’s anatomical works.

With his comprehensive scientific studies of human bodies, the young professor of medicine not only revolutionizes anatomy, but consequently, the whole science of medicine.

During the Renaissance, the dissections are not only of interest to a medical forum, but also access by the broader public.

This becomes evident on the frontispiece illustration for Andreas Vesalius’ 7-volume opus, “On the Fabric of the Human Body.” It shows Vesalius performing a dissection in a crowded theatre.

ANATOMICAL THEATERS | 17TH CENTURY

Artistic passion inspires the anatomists of the Renaissance, and interest in anatomy grows among the masses. More and more, physicians, as well as the general public, want to see the human body with their own eyes. The word “autopsy” hails from the Greek phrase, “To see with one’s own eyes.”

Anatomical theaters are built in many cities. Rich and poor alike would flock to the public dissection presentations.

ANATOMICAL ART | 18TH CENTURY

Some anatomists use their dissection skills in a traditionally artistic way and render their specimens into lasting works of art. Honoré Fragonard renders his anatomical specimens into lasting pieces of art. He injects them with colored wax that hardens inside the blood vessels. The remaining tissues dries up and is treated with varnish. His works are still on display at the Ecole Nationale Vétérinaire d’Alfort near Paris, France.

In the 18th century, anatomical artists create the first whole-body specimens, which are dried and varnished. Some specimens from that time contain metal alloys which are melted and injected into the arteries while still hot.

MODERN ANATOMY | 19TH/20TH CENTURY

After the principles of human macroscopic anatomy — the study of dissected organs — is established. The field of anatomy becomes more specialized, and the microscopic anatomical realm opened up to anatomical scholarship.

The public interest in anatomy does not wane for several centuries. It is not until the 19th century, when anatomy becomes a science, that the public is excluded from witnessing dissections. ●



“It is the mind that makes the body.”

SOJOURNER TRUTH // African-American abolitionist and women’s rights activist

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ART

Dos and Don'ts of Drawing Anatomy

BY MARIA WOODIE | *Artists Network*

Don't think like an anatomy book

Drawing anatomy for beginners can feel overwhelming at first because there are so many muscles on the body. When you're looking at a model and you see a lot on bumps, you might be tempted to pull out an anatomy book to decipher what's going on under the skin.

An anatomy book is great at telling you what you're looking at but it's not very helpful at telling you the three-dimensional shape of the muscles.

Do think in simple volumes | When you first approach figure drawing, you need to start out with establishing the basic volumes of the figure using spheres, boxes, and cylinders. By simply beginning with these basic shapes and then building up the complexity as you go along, you will be able to make your drawing maintain its sense of dimension.

If you copy contours before you build in the structure, I guarantee you'll end up with a flat-looking drawing.

Use an anatomy book to understand what's below the surface but think about each muscle in 3D. Don't draw the muscles as a series of lines. Draw them as sculpted spheres, boxes and cylinders.

Don't make muscles the focus | When artists first start paying closer attention to adding anatomy to their drawings, they often have a tendency to over-emphasize the anatomy. The figures often end up looking like they have no skin. The muscles are there to add more realism to the figure, but they shouldn't be the focal point of the drawing.

Do use muscles to reinforce the action

The focus of a drawing should convey an action, an emotion or the subject's personality. You don't want a viewer to stop and look at the parts of your drawing; you want the viewer to see the whole figure and be interested in what that figure is doing and who they are.

In order to maintain focus on the action it's always a great practice to start all your drawings with a gesture drawing. A gesture drawing serves as a blueprint for the action. Everything that comes after is to help clarify and enhance that action.

Don't draw every figure with the same shapes | When artists start using basic shapes to develop figures

they often start to fall into a pattern of using the same shapes to build every figure.

Do observe and adapt to your figure's unique build

| When you're building your figure you have to look and adapt your shapes to the specific subject you're drawing. You're not going to use the same shapes for a bodybuilder that you would a sumo wrestler or a long distance runner.

You have to look at your subject and figure out what simple shapes are the best tools to develop your figure. For example, some people have very squarish heads which needs to be constructed from box shapes while others have a more roundish appearance that should be built from spheres.

Don't copy what you see | If you only copy what you see you will never create what you imagine. I never saw the point of replicating a photo in a drawing beyond being an exercise to build observational skills. Why duplicate what already exists when you can interpret and adapt as you see fit?

Do recreate what you see on the page | Observational skills are important but not just for copying what you see. Use your observational skills to analyze your subject's unique shapes so you can reinterpret it on the page. That means you aren't copying contours of the body. Instead, you're recreating a figure on the page from the ground up.

Do pay attention to proportions and anatomy | To draw a realistic figure, you need to pay attention to accurately capture the figure's proportions and anatomy. This comes from both studying and having good observational skills.

Don't be overly rigid | Anatomy and proportion are important. But alone, they don't make for an interesting drawing. A figure drawing that feels like it has personality or appears dynamic is going to be more interesting than one that is technically correct.

Let the anatomy and proportion take a supporting role to the underlying gesture drawing. Every step of your drawing should be to create a unified figure that has energy and attitude even if that means altering the figure's proportions or anatomy to better emphasize that action. ●



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MATHEMATICS

Sudoku

#275 PUZZLE NO. 3075627

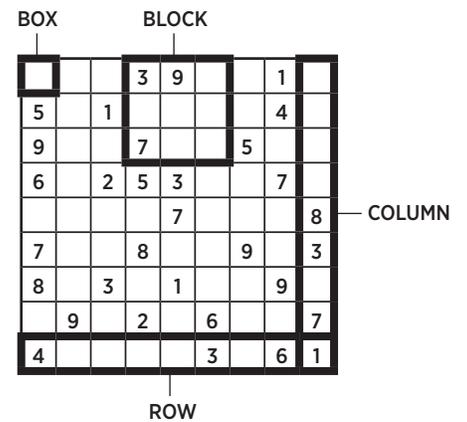
	2					4	
				6	5	9	
1			5	8			
		4		8			
			9			5	
				3			6
	1			3			5
	7				6		3
	8	6				1	

#276 PUZZLE NO. 4979246

	7				8		
	9			6	4	3	
	5	3			2		
1			3			8	5
			7	1			
8							
			5		6		
7				4	1		
				6		3	4

SUDOKU HOW-TO GUIDE

1. Each block, row, and column must contain the numbers 1-9.
2. Sudoku is a game of logic and reasoning, so you should not need to guess.
3. Don't repeat numbers within each block, row, or column.
4. Use the process of elimination to figure out the correct placement of numbers in each box.
5. The answers appear on the last page of this newsletter.



What the example will look like solved 📌

2	4	8	3	9	5	7	1	6
5	7	1	6	2	8	3	4	9
9	3	6	7	4	1	5	8	2
6	8	2	5	3	9	1	7	4
3	5	9	1	7	4	6	2	8
7	1	4	8	6	2	9	5	3
8	6	3	4	1	7	2	9	5
1	9	5	2	8	6	4	3	7
4	2	7	9	5	3	8	6	1



“I have seen the movement of the sinews of the sky, And the blood coursing in the veins of the moon.”

MUHAMMAD IQBAL // South Asian Muslim writer, philosopher, and politician

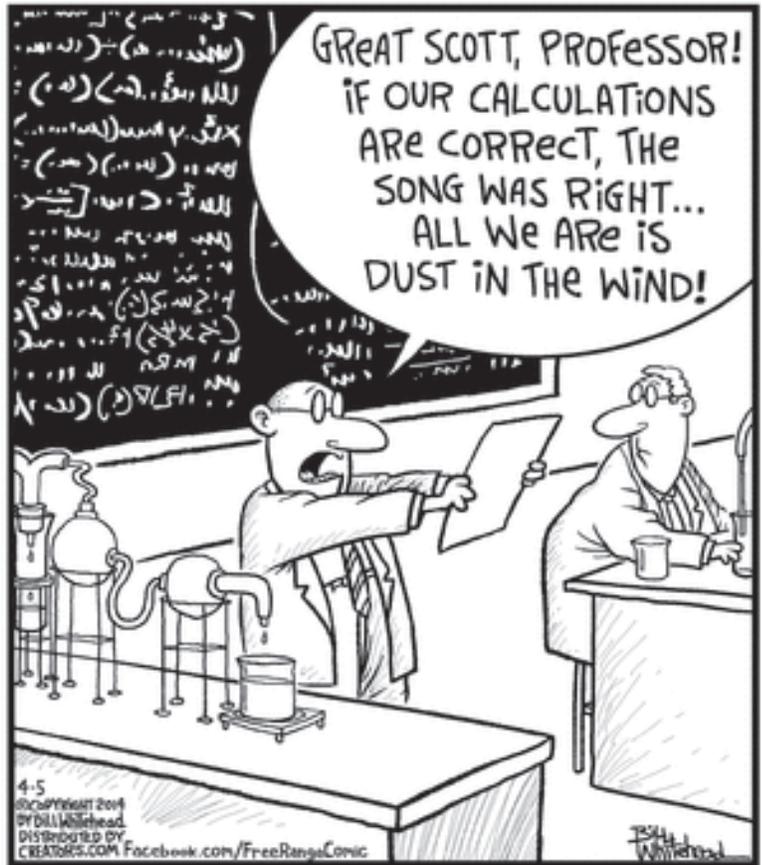
DID YOU KNOW?

Infants are born with approximately **300 bones**, but as they grow some of these bones fuse together. By the time they reach adulthood, they only have 206 bones.

More than **half of your bones** are located in the hands, wrists, feet, and ankles.

Every second, your body produces **25 million new cells**. That means in 15 seconds, you will have produced more cells than there are people in the United States.

There is anywhere between **60,000-100,000 miles of blood vessels** in the human body. If they were taken out and laid end-to-end, they would be long enough to travel around the world more than three times.



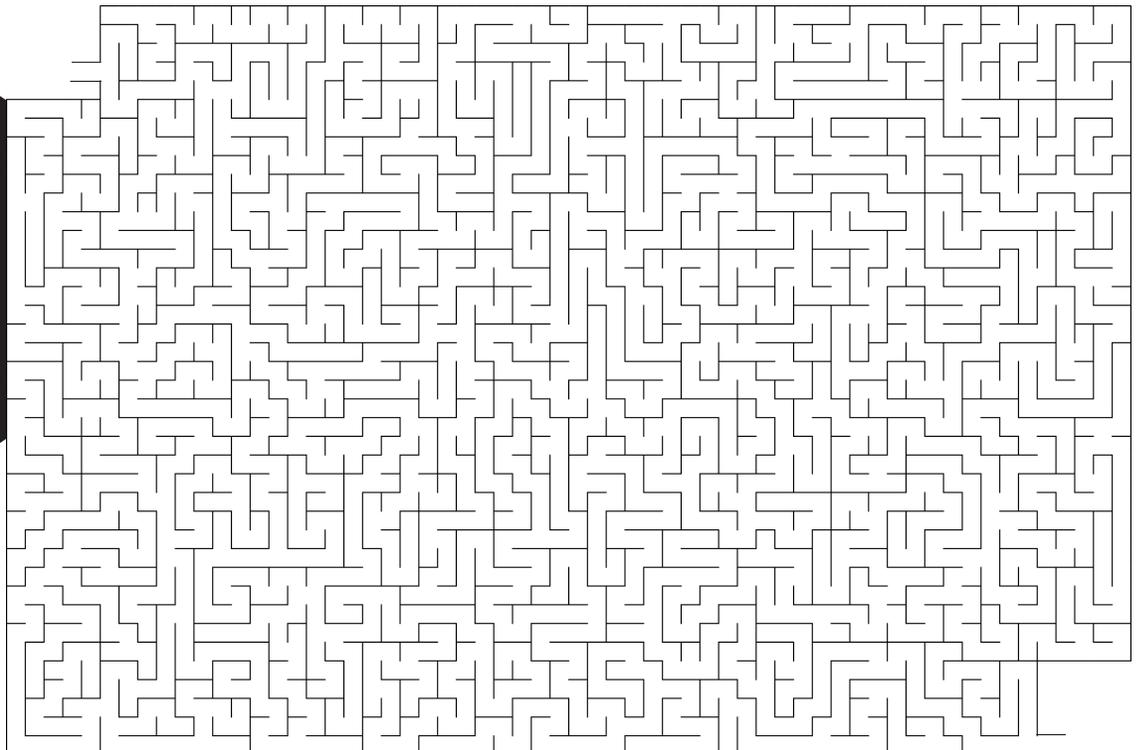
THE LARGEST BONE IN THE HUMAN BODY IS THE **FEMUR**, ALSO KNOWN AS THE THIGH BONE.

Maze ▶

This maze is a collection of paths. The player starts at one entry point and follows a path of their choice to reach the other exit/entry point. Good luck!



THE SMALLEST BONE IS THE **STIRRUP BONE**, WHICH IS LOCATED INSIDE YOUR EAR DRUM.



ART + CULTURE

Question

BY MAY SWENSON

Body my house
my horse my hound
what will I do
when you are fallen

Where will I sleep
How will I ride
What will I hunt

Where can I go
without my mount
all eager and quick
How will I know
in thicket ahead
is danger or treasure
when Body my good
bright dog is dead

How will it be
to lie in the sky
without roof or door
and wind for an eye

With cloud for shift
how will I hide?



WRITING PROMPT

In this poem, the author is using metaphors when describing the role of her body. The overall poem is written in the form of a rhetorical question directly posed to herself or the thoughtful readers. Using this as a prompt, illustrate or create a short essay, illustration, blog, or poem that uses metaphors to describe your own body and how it functions.

May Swenson was born in Logan, Utah to Swedish immigrant parents — English was Swenson’s second language, and she grew up speaking Swedish at home. Swenson earned a BA from Utah State University and briefly worked as a reporter in Salt Lake City. She moved to New York City in the 1930s and in 1959 she began working at New Directions Press, the modernist publishing house founded by James Laughlin. Swenson is considered one of mid-century America’s foremost poets.

Word Search

L	H	S	Q	P	F	H	H	G	Q	C	U	V	E
C	L	W	O	Y	A	H	Y	P	U	J	S	I	D
F	U	E	T	F	L	P	Z	D	E	M	T	S	E
X	O	T	N	X	L	W	W	E	S	E	H	L	S
E	P	E	N	T	E	S	T	S	T	T	X	U	C
O	O	R	Q	H	N	F	R	C	I	A	D	M	R
V	D	N	A	I	G	H	E	R	O	P	A	B	I
F	A	I	L	C	V	O	A	I	N	H	N	E	P
Q	N	T	J	K	L	U	S	B	I	O	G	R	T
W	A	Y	L	E	V	S	U	I	N	R	E	N	I
B	T	A	W	T	M	E	R	N	G	S	R	E	O
P	O	B	V	Y	L	D	E	G	X	K	O	R	N
U	M	W	L	Q	Z	V	X	K	R	G	U	B	N
H	Y	Y	R	Y	R	K	C	P	N	B	S	V	P

- | | | | |
|-----------|-------------|-------------|---------|
| TREASURE | METAPHORS | QUESTIONING | HOUSED |
| THICKET | DESCRIPTION | DESCRIBING | FALLEN |
| DANGEROUS | ANATOMY | ETERNITY | SLUMBER |

HISTORY

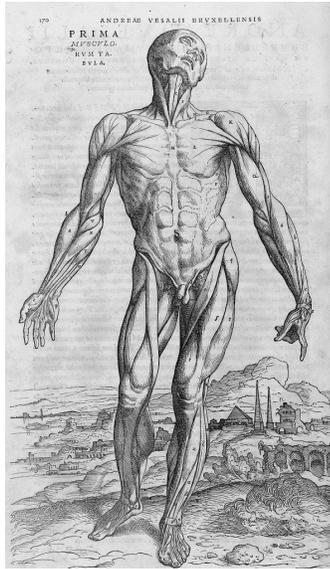
The Fabrication of Anatomy

BY ANNAGH DEVITT | *International Museum of Surgical Science* | May 30, 2019

Most visitors to the Museum recognize something “off” about this skeleton. This ‘something’ is hard to pin down; perhaps it is the unsettling face, or the way the shoulders stick out a little too far, or maybe it is the artistic rendering of the humerus that curves like the end of a dining room chair. The visitors’ instincts are right; this skeleton, is not quite correct, or rather not quite human.

The image is a Galenic ideal, or the anatomy popularized by the ancient Greek physician Galen. In his time, human dissections were outlawed so most of his anatomical work was a result of animal dissections, primarily dogs, pigs, and primates. Despite his limitations, Galen’s assumptions and attempts to understand the human form are rather remarkable. Perhaps the most critical aspect of Galen’s work is how long it was relevant. For nearly 1,500 years, the Grecian’s work was accepted as truth and never questioned, despite his successor’s use of human cadavers. Visitors to the Museum do not need to be doctors or have extensive knowledge of anatomy to see that Galen’s skeleton is wrong; similarly, non-physicians throughout the ages did not need a medical background to represent the human form in art or to preserve a dead body. Humans have known much more about anatomy than would be surmised by medical history alone.

Often it was neither doctors nor physicians advancing anatomical knowledge but artists and embalmers. That’s not to say physicians were uninterested in anatomy; instead, it was a matter of application. While the knowledge of an anatomical system might be known, the tools to use that knowledge for diagnosis and surgery were not. Because of this, we see two parallel histories: one of medical development and achievement and the other of ritualistic practices and artistic endeavors, both of which aid our



current understanding of anatomy.

Physicians after Galen suffered from this separation of advancements. The artists were often the ones dissecting humans, or put more aptly, the ones actually learning from human cadavers. When human dissection began to be accepted, Galen’s teachings had been taught long enough to be accepted as doctrine. So, when physicians did dissect cadavers, they often did so only to demonstrate what was already known, often perpetuating anatomical inaccuracies.

The convergence of these two histories occurred quite literally. Vesalius, the father of modern anatomy, as with many physicians of his time got medicine from an apothecary, the same place many artists got their pigments. From chance interactions, Vesalius likely learned what later caused him to make his famous *De Humani Corporis Fabrica*. In his first illustration he gives credit to Galen for his advancement with the inclusion of a monkey and a dog in his anatomical theater, two of the animals Galen used in his studies. However, Vesalius himself is guiding the dissection, seemingly a criticism of the anatomists of his time.

Vesalius’ other illustrations also seem to illustrate the convergence of art and medicine. In his famous muscle man, he depicts his figure in many artistic poses, again in contrast to the zodiac man. Furthermore, the background of his multiple figures come together to make one large sense as if to create a narrative alongside his anatomical display.

Vesalius shed light on many of the unknowns of human anatomy. While his depictions were not completely accurate, there were no greater breakthroughs in form. The anatomical achievements after Vesalius mainly had to do with the greater methods of anatomical teachings and improved ethics. ●

Image from Vesalius’ *De humani corporis fabrica* (1543)

“Somehow, we have come to the erroneous belief that we are all but flesh, blood, and bones, and that’s all. So we direct our values to material things.”

MAYA ANGELOU // African-American poet and author

● Edited for clarity

STEPPING

	<p>Step TIME</p>	<p>some fresh air some fresh air some fresh air some fresh air</p>
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WORD PLAY A Rebus puzzle is a picture representation of a common word or phrase. How the letters/images appear within each box will give you clues to the answer! For example, if you saw the letters “LOOK ULEAP,” you could guess that the phrase is “Look before you leap.” *Answers are on the last page!*

FEATURE

The Human Body | Anatomy, Facts & Functions

BY RACHEL RETTNER & SCOTT DUTFIELD | *Live Science* | December 17, 2021

The human body is everything that makes up, well, you. What decides and regulates the physical form and function of the human body is our genetic information, however, external environments and behaviors can alter the way our body's look and how well they function.

The human body is made up of all the living and nonliving components that create the entire structure of the human organism, including every living cell, tissue and organ.

On the outside human anatomy consists of the five basic parts, the head, neck, torso, arms and legs. However, beneath the skin there are countless biological and chemical interactions that keep the human body machine ticking over.

Our bodies consist of a number of biological systems that carry out specific functions necessary for everyday living.

The job of the **circulatory system** is to move blood, nutrients, oxygen, carbon dioxide, and hormones, around the body. It consists of the heart, blood, blood vessels, arteries and veins. According to the Cleveland Clinic, the human body's network of blood vessels, veins and capillaries is over 60,000 miles (around 96,560 kilometers) long.

The **digestive system** consists of a series of connected organs that together, allow the body to break down and absorb food, and remove waste. It includes the mouth, esophagus, stomach, small intestine, large intestine, rectum, and anus. The liver and pancreas also play a role in the digestive system because they produce digestive juices filled with enzymes to break down the components of your food, such as carbohydrates, fats and proteins, according to the National Institute of Diabetes and Digestive and Kidney Diseases.

The **endocrine system** consists of a network of glands that secrete hormones into the blood. These hormones, in turn, travel to different tissues and regulate various bodily functions, such as metabolism, growth and sexual function, according to Johns Hopkins Medicine. For example, one of the glands in the pancreas - called the endocrine gland - releases hormones called insulin and glucagon to regulate blood sugar.

The **immune system** is the body's defense against bacteria, viruses and other pathogens that may be harmful. The immune system is activated

when antigens (proteins on the surface of bacteria, fungi and viruses) bind with receptors on immune cells, alerting the body to their presence and kicking the immune system into gear, according to Institute for Quality and Efficiency in Health Care. The system is made up of lymph nodes, the spleen, bone marrow, lymphocytes (including B-cells and T-cells), the thymus and leukocytes, which are white blood cells.

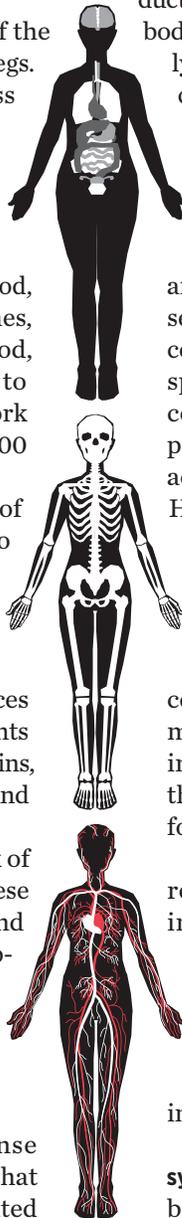
The **lymphatic system** includes lymph nodes, lymph ducts and lymph vessels, and also plays a role in the body's defenses. Its main job is to make and move lymph, a clear fluid that contains white blood cells, which help the body fight infection, according to the Cleveland Clinic. The lymphatic system also removes excess lymph fluid from bodily tissues, and returns it to the blood.

The **nervous system** controls both voluntary action (like conscious movement) and involuntary actions (like breathing), and sends signals to different parts of the body. The central nervous system includes the brain and spinal cord. The peripheral nervous system consists of nerves that connect every other part of the body to the central nervous system, according to the National Institute of Child Health and Human Development.

The body's **muscular system** consists of about 650 muscles that aid in movement, blood flow and other bodily functions, according to the Library of Congress. There are three types of muscle: skeletal muscle which is connected to bone and helps with voluntary movement, smooth muscle which is found inside organs and helps to move substances through organs, and cardiac muscle which is found in the heart and helps pump blood.

The **reproductive system** allows humans to reproduce. The male reproductive system includes the penis and the testes, which produce sperm. The female reproductive system consists of the vagina, the uterus and the ovaries, which produce eggs. During conception, a sperm cell fuses with an egg cell, which creates a fertilized egg that implants and grows in the uterus.

Our bodies are supported by the **skeletal system**, which consists of between 206 and 213 bones in an adult human body, which are all



“Food for the body is not enough. There must be food for the soul.”

DOROTHY DAY // American journalist, social activist, and Catholic convert

Image from iStock

RANDOM-NEST

The Study of Anatomy

BY DR. BETH HARRIS AND DR. STEVEN ZUCKER | KHAN ACADEMY

connected by tendons, ligaments and cartilage, according to the journal *StatPearls*. As infants, humans have 270 bones, before some fuse together during growth. The skeleton not only helps us move, but it's also involved in the production of blood cells and the storage of calcium. The teeth are also part of the skeletal system, but they aren't considered bones.

The **respiratory system** allows us to take in vital oxygen and expel carbon dioxide in a process we call breathing. It consists mainly of the trachea, the diaphragm and the lungs.

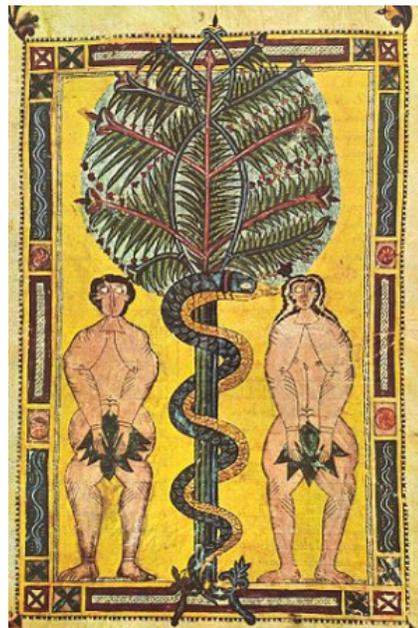
The **urinary system** helps eliminate a waste product called urea from the body, which is produced when certain foods are broken down. The whole system includes two kidneys, two ureters, the bladder, two sphincter muscles and the urethra. Urine produced by the kidneys travels down the ureters to the bladder, and exits the body through the urethra.

The skin, or **integumentary system**, is the body's largest organ. It protects us from the outside world, and is our first defense against bacteria, viruses and other pathogens. Our skin also helps regulate body temperature and eliminate waste through perspiration. In addition to skin, the integumentary system includes hair and nails.

Unlike the vital organs, there are some other organs and structures within the human body that no longer serve a purpose — known as vestigial organs. That's not to say that they didn't once play a role in human survival, according to the Department of Anatomy at Northwestern University.

Over the course of human evolution, some organs and anatomical structures have lost their function, for example, the coccyx or tailbone. It was Charles Darwin that first proposed that humans descended from primates with tails, noting the tiny set of vertebrae we all share adjacent to the pelvis - called the coccyx — is what remains of our ancestral tail, according to *The New York Times*.

Another well-known example of a seemingly functionless organ is the appendix. The appendix is a narrow pouch attached to the lower abdominal cavity of the human body. It's generally considered to be redundant in the function of the human body, however, in 2017 research conducted by Northwestern University suggested that the appendix may serve as a reservoir for several types of beneficial gut bacteria. ●



Picking up from the ancients

We can see from Donatello's sculpture of *David* (right) — with its careful depiction of bones and muscles and a nude figure — that the study of human anatomy was enormously important for Renaissance artists. They continued where the ancient Greeks and Romans had left off, with an interest in creating images of the human beings where bodies moved in natural ways — in correct proportion and feeling the pull of gravity.



Sculptures from ancient Greece and Rome reveal that classical artists closely observed the human body. Ancient Greek and Roman artists focused their attention on youthful bodies in the prime of life. Ancient sources indicate these artists used models to help them study the details of the body in the way that it looked and moved. These artists tried to show their viewers that they understood systems of muscles beneath the skin.

In the Middle Ages, there was very little interest in the human body, which was seen as only a temporary vessel for the soul. The body was seen as sinful, the cause of temptation. In the Old Testament, Adam and Eve eat the apple from the tree of knowledge, realize their nakedness, and cover themselves. Due to the nudity in this important story, Christians associated nudity with sin and the fall of humankind. Medieval images of naked bodies do not reflect close observation from real life or an understanding of the inner workings of bodies.

Dissection

The best way to learn human anatomy is not just to look at the outside of the body, but to study anatomy through dissection. Even though the Catholic Church prohibited dissection, artists and scientists performed dissection to better understand the body. Renaissance artists were anxious to gain specialized knowledge of the inner workings of the human body, which would allow them to paint and sculpt the body in many different positions.

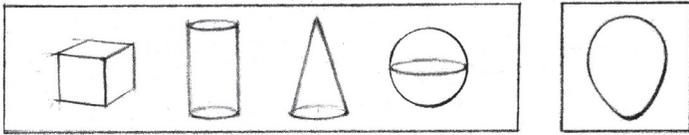
The artists of the Early Renaissance used scientific tools (like linear perspective and the study of anatomy and geometry) to make their art more naturalistic, more like real life. The term "naturalism" describes this effort.

Scientific naturalism allowed artists in the Early Renaissance to begin to demand that society think of them as more than just skilled manual laborers. They argued that their work — which was based on science and math — was a product of their intellect just as much as their hands. They wanted artists to have the same status as intellectuals and philosophers, unlike the medieval craftsmen that came before them.

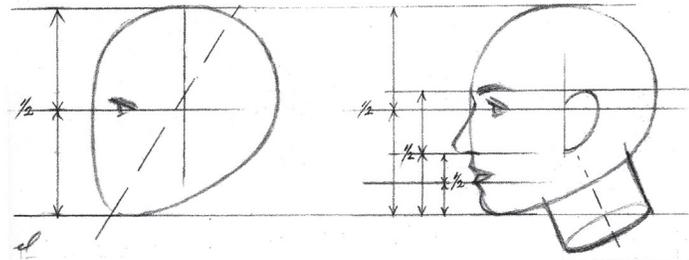
The medieval approach to the human body can be seen in this manuscript illumination. Artist unknown, Adam and Eve from the Escorial Beatus, c. 950, tempera on parchment.

Image from Real Biblioteca de San Lorenzo de El Escorial

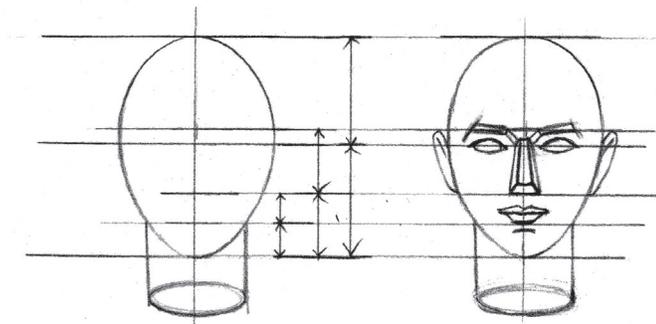
HOW TO DRAW ...



Basic shapes used in drawing. The new basic form I'd like to introduce as the basis for drawing the head is the egg shape at the right. Imagine holding an egg in your hand — feel its volume and weight! Remember this when you begin drawing.



Draw the egg at about a 45° angle. A simple rule of “halves” will help you position the features. Halfway down is the eye. Halfway between the eyebrow and the chin is the base of the nose, and halfway between the base of the nose and the chin is the edge of the lower lip. Use these guidelines for general proportions of the human head but remember, each face is unique and adjustments may need to be made.



Naturally the “halfway” measurements hold true for a front view of the head as well as a profile or three-quarter view. Notice that the egg here is upright. Although the neck is actually considered part of the upper torso, try to include it and the shoulders when possible.

TIP The proportions of a baby's head differ markedly from those of an adult. A baby's eyes are well below the halfway mark.

Source: *How to Draw What You See* by Rudy de Rens, Watson-Guptill Publications, New York // Edited for clarity



Answers

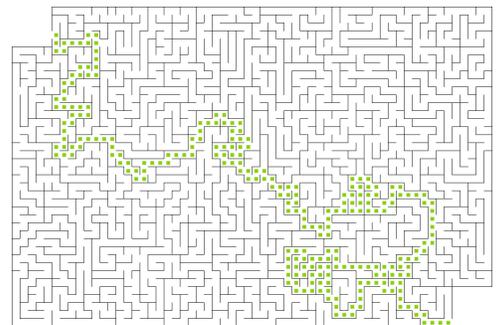
SUDOKU #275

6	2	5	3	1	9	8	4	7
8	4	3	7	2	6	5	9	1
1	9	7	5	8	4	3	6	2
2	6	4	1	5	8	7	3	9
7	3	1	9	6	2	4	5	8
9	5	8	4	7	3	2	1	6
4	1	2	6	3	7	9	8	5
5	7	9	8	4	1	6	2	3
3	8	6	2	9	5	1	7	4

SUDOKU #276

6	7	1	4	3	2	8	5	9
2	9	8	1	5	6	4	3	7
4	5	3	8	7	9	2	1	6
1	6	9	3	2	4	7	8	5
3	2	5	7	1	8	9	6	4
8	4	7	6	9	5	1	2	3
9	1	4	5	8	3	6	7	2
7	3	6	2	4	1	5	9	8
5	8	2	9	6	7	3	4	1

Page 5 MAZE



Page 7 REBUS PUZZLE

1. Mid Wife
2. One Step at a Time
3. Stepping Out For Some Fresh Air

WORDS OF ENCOURAGEMENT

Poets, authors, and artists have produced numerous pieces of art to describe the human body. Scientists, doctors, and others who study the body and how it functions have also found ways to describe this amazing creation. New discoveries are made daily, and we are so fortunate that there are those so interested in learning about the body that we might have access to this information.

We hope this edition of *The Warbler* brought you some new information about the anatomy of the body and maybe peaked your interest a little. We are always looking for new subjects for this newsletter and are anxious to hear your suggestions. Maybe there is something you would like to know a little more about, and we would love to provide you with that information! Hope you are well and have a great week!

Tammy

UNTIL NEXT TIME 