ANATOMICAL EVIDENCE FOR CREATION: DESIGN IN THE HUMAN BODY

DAVID A. KAUFMANN*

Received 14 July 1993; Revised 1 October 1993

Abstract

The human body is designed for precise, efficient functioning. In our human realm, creative inventors and engineers design and develop simple and complex machines that perform work more efficiently. A review of examples of pulley systems, wheels and axles, friction-reducing sacs within joints and compression/tension abilities of bones in the human body is presented. The functional superiority of the human brain over lower animals is cited. Since designs infer a designer, an unbiased observer would have great difficulty denying the rationality of inferring that these highly designed mechanisms in the human body had to be designed by an outside, suprahuman intelligent agent (Logos), the Creator.

Introduction

In the real world a design logically infers a designer. The human body abounds with such intricate designs. The pulley is one of man's most work-saving machines; 13 examples of pulleys in the human body which are grouped into five classes will be discussed. The functioning of the shoulder girdle, ribs and vertebral column and pelvic girdle as a wheel and axle system is also presented. The purposeful function of friction reduction by bursae in the human joints is reviewed, along with an explanation of how bones are designed to resist tension and compression. Finally, the creative superiority of the human brain over animal brains is discussed. To the reasonable person, it is logical to conclude that these complex, efficient, purposeful mechanisms in the human body did not evolve by consecutive random accidents of unthinking molecules reacting together but are the result of the planned thinking and workmanship of a Divine Designer.

When one of my anatomy students who has just comprehended one of the intricate designs in the human body asks me "How did this happen to evolve?" My usual reply is "All intricate designs in the human body cannot be explained by gradual mutations over vast periods of time. God must have gotten into the act." Since in the real world, the existence of a watch demands the mind and effort of a watchmaker, likewise the existence of an intricate design in the human body demands the existence of the mind and effort of a brilliant Designer. Complex designs do not originate by random raw material accidentally meeting a random energy system over an everlasting period of time. To put it in collegiate slang, "How can nobody make everything?" There must be a Grand Designer behind every grand design.

I compare this argument to the field of automotive production. Some autos are better than others because of better design and quality workmanship. There has to be a "thinking force" behind every designed part. Automobiles are not made by unthinking randomness. Holroyd (1975, p. 95) has stated it succinctly, "When changes are made in good designs by accidents, it is practically certain that the designs will be damaged or destroyed."

At one time as an immature student of science, I had great admiration for man-controlled secular science. But after more than 25 years of scientific experience, I realize how weak and limited man-devised science is. It is very easy to distinguish between man-made and God-made designs. The more you magnify man-made designs, the cruder they appear; but the more you magnify God-made designs the more complex and precise they appear. One of the giants of science has said it clearly:

> It is not to be conceived that mere mechanical causes could give birth to so many regular motions . . . this most beautiful system of the sun, planets and comets, could only proceed from the council and dominion of an intelligent and powerful being (Newton, 1952, p. 369).

*David A. Kaufmann, Ph.D., Dept. of Exercise and Sport Sciences, Univ. of Florida, Gainesville, FL 32611-2034.

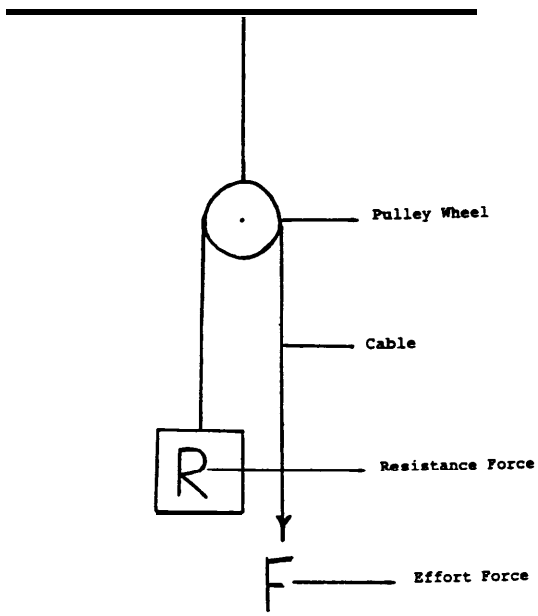

Figure 1. Simple pulley.

Pulleys in the Human Body

Earlier (1974, pp. 91-94) I cited some examples of mechanical designs in the human body. In this article I would like to cite some further examples of well-designed pulley systems in the human body that obviously infer the planned thinking and workmanship of a Divine Designer. A pulley can be defined as a wheel, sometimes turning in a block, with a grooved rim in which a rope or chain runs that can raise or lower a weight attached at one end by pulling on the other end. It is

one of the simple machines of mechanics, a subdiscipline of physics. Other simple machines are the lever, the inclined plane, the wheel and axle, the gear, the wedge, and the screw. From these simple machines most more complex machines can be devised and built. In general, these simple machines either give a resistance force a higher velocity at the expense of an effort force or gain magnitude of effort force at the sacrifice of magnitude of velocity.

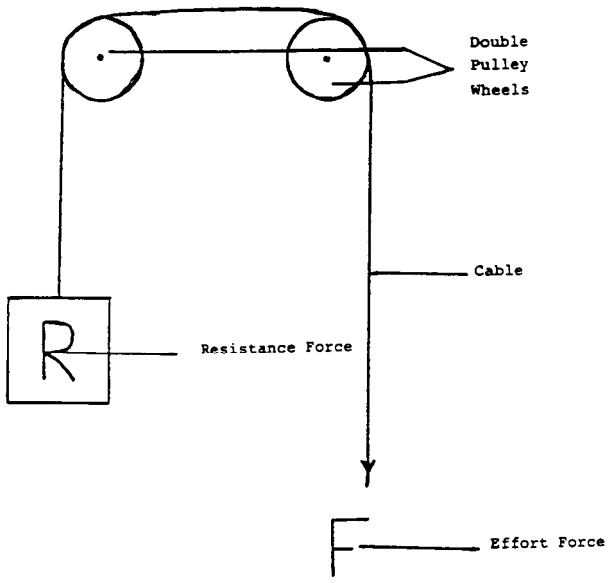

Figure 2. Double pulley.

There are two basic types of pulley systems. First is the "block and tackle" system which has both fixed and moveable pulleys. In this system, greater magnitude of force is gained at the expense of applying a lesser magnitude of force over a greater distance. Second, pulleys are used to change the direction of an applied force. Figures 1 and 2 depict two basic types of pulleys devised by "intelligent" man. There are a number of bone-joint structures in the human body which simulate the pulley action of changing the direction of an applied force. In most cases a rounded bony part acts as the pulley wheel, the tendon acts as the cord, the muscular contraction supplies the effort force and the weight of the bone (limb) located at its center of gravity acts as the resistance force.

An anatomical pulley has two mechanical purposes. Some pulleys will completely change the action of a joint. Other pulleys will alter the angle of muscular insertion giving the muscle a mechanical advantage. Figures 3 and 4 demonstrate the difference between a muscle with a small angle of insertion and a muscle with a large angle of insertion.

Classification of Pulleys

Coleman (1978, pp. 63-73) has grouped pulleys into five classes. These classifications with examples in the human body are clear signs of simple mechanical devices that had to be designed by a Divine Designer.

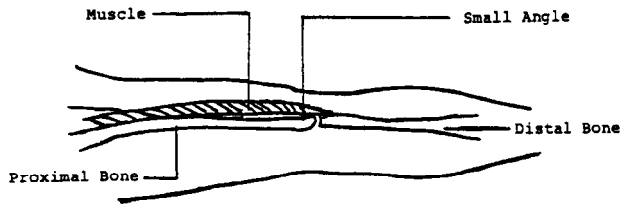

Figure 3. Muscle with small angle of insertion.

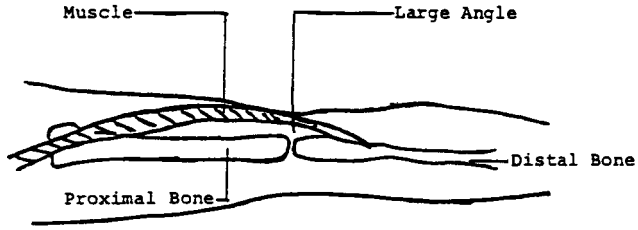

Figure 4. Muscle with large angle of insertion.

Class I Pulleys

In this class an improved joint action results from the muscle tendon passing over an external structure which serves as the pulley wheel.

Example 1: The knee joint is the most obvious example (Figure 5). In reality, the patella is not necessary for the quadriceps muscle group to extend the tibia bone. But the patella is necessary to change the angle of insertion of the patellar ligament (which is an extension of the quadriceps tendon) into the tuberosity on the tibia. This hemispheric bone increases the angle of insertion of the patellar ligament which increases the trigonometric sine relationship which increases the magnitude of the applied force on the tibia.

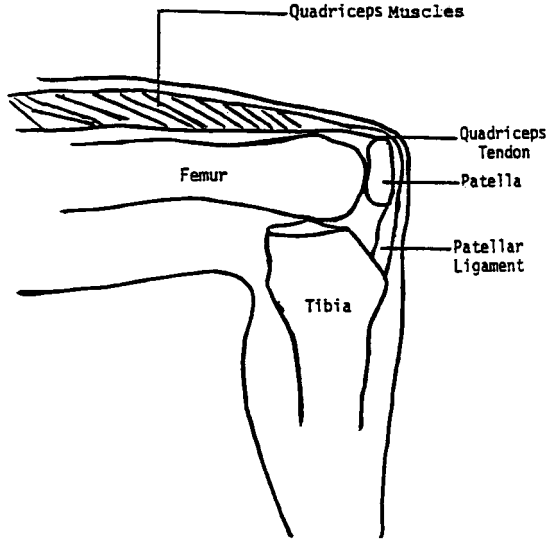

Figure 5. Patella acting as pulley at knee joint.

Example 2: At the hip joint the psoas major muscle passes over the brim of the lesser pelvis (Figure 6). As a person lies on his back, both the origin on the lumbar vertebrae and the insertion on the lesser trochanter of the femur are posterior to the brim of the lesser pelvis.

The elevated brim of the lesser pelvis increases both the angle of origin and angle of insertion of the psoas major. If the trunk is flexed on the femur or femur flexed on the trunk, both movements have a greater magnitude of applied force because of this increase in angular pull. This pulley device at the hip joint causes two major kinesiological results. First, if the brim of the lesser pelvis did not improve the angle of pull of the psoas major, this muscle could not be a major hip flexor. Second, the psoas major would not be the main muscular culprit in promoting the prevalent postural disorder lordosis (hollow back).

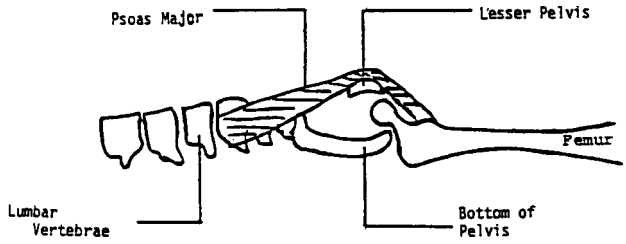

Figure 6. Brim of lesser pelvis acting as pulley for psoas major muscle at hip joint.

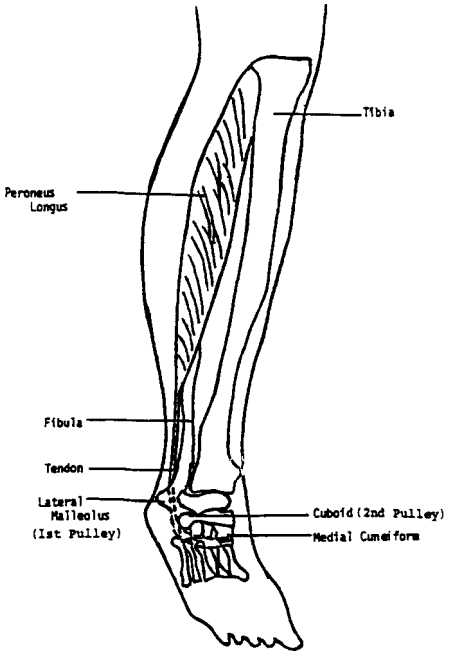

Figure 7. Lateral malleolus and cuboid acting as double pulleys for peroneus longus muscle about ankle joint.

Class II Pulleys

In this class the action of the muscle at the joint is altered because of the pulley.

Example 1: Figure 7 depicts the tendon of the peroneus longus muscle proceeding down the lateral calf behind the first pulley, the lateral malleolus of the fibula, curving forward and under the foot, passing along the groove in the second pulley, the cuboid bone, and finally inserting on the lateral side of the medial (first) cuneiform bone. The first pulley causes the applied force to plantar flex the ankle (extending the foot as in pointing the toes), and the second pulley causes the applied force to evert the ankle (as moving the lateral border of the foot away from the midline of the body in a frontal plane). Without these pulleys this muscle would insert in front of the ankle and on top of the foot, and its action would be limited to only dorsiflexion at the ankle joint (moving the instep toward the tibia in a sagittal plane).

Example 2: Figure 8 depicts the action of the superior oblique muscle of the eye. The tendon of this muscle passes over a small cartilagineous bridge called the trochlea (Latin for pulley). This change in angle of pull causes this muscle to rotate the eyeball either clockwise (right eye) or counterclockwise (left eye).

Example 3: Figure 9 depicts the omohyoid muscle pulling on the hyoid bone, a horseshoe shaped bone in the anterior neck. The pulley is a ligamentous sling which directs the applied force downward rather than backward.

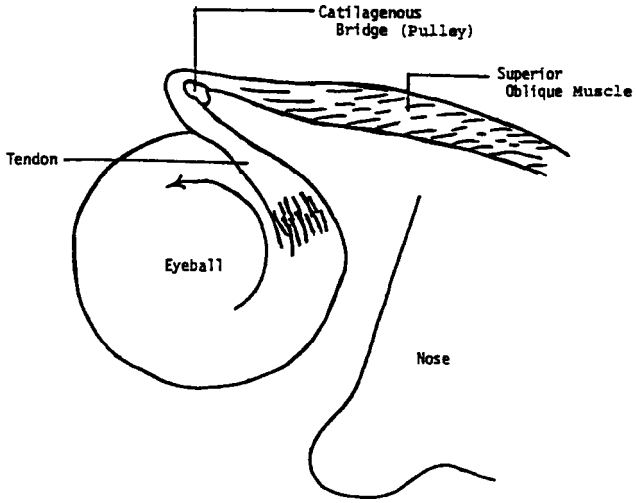

Figure 8. Cartilagenous trochlea acting as pulley for superior oblique muscle of eye.

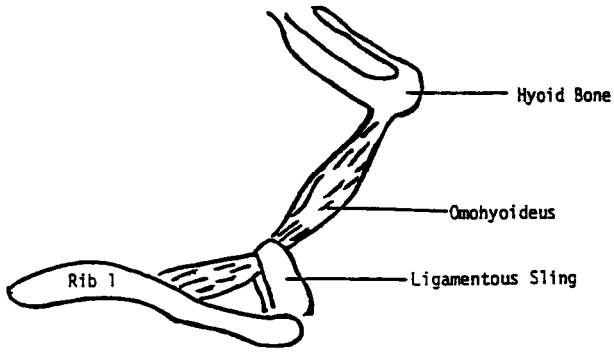

Figure 9. Ligamentous sling acting as pulley for omohyoideus which pulls downward on hyoid bone on anterior neck.

Class III Pulleys

In this class the joint framework serves as the pulley.

Example 1: Figure 10 depicts the flexor digitorum profundus passing over the knuckles of the distal interphalangeal joint. Similarly, the tendon of the gracilis muscle on the medial thigh gains a favorable angle because of the size of the medial epicondyles of the femur (Figure 11).

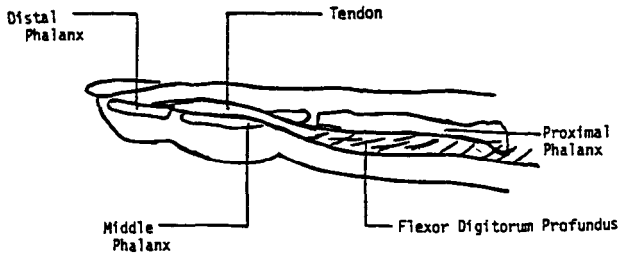

Figure 10. Distal interphalangel joint acting as pulley for flexor digitorum profundus on anterior fingers.

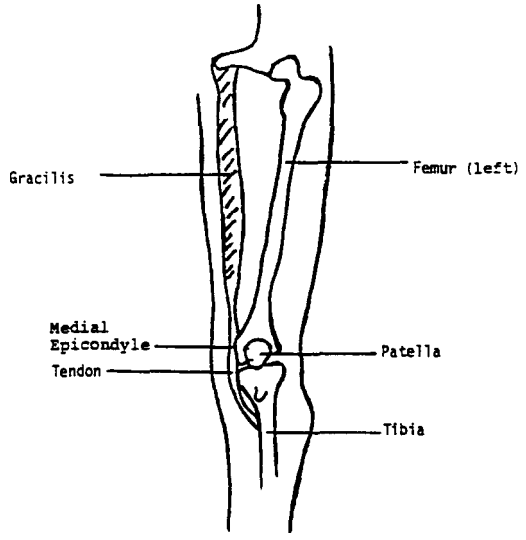

Figure 11. Epicondyle of femur acting as pulley for gracilis tendon which pulls on tibia.

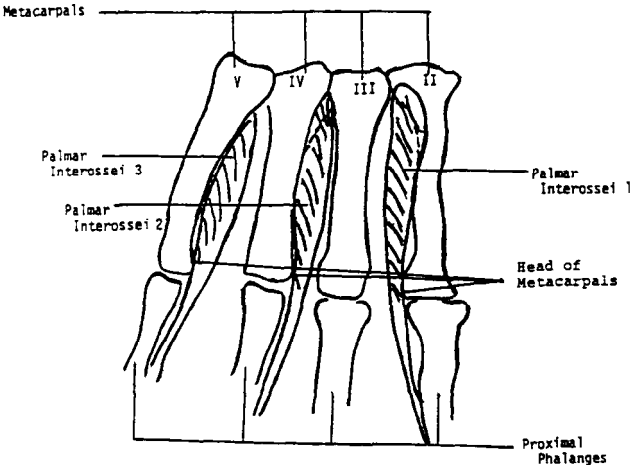

Figure 12. Metacarpophalangeal joint acting as pulley for Palmer interossei muscles on anterior fingers.

Example 2: Figure 12 depicts the tendons of the palmar interossei muscles as they pass over the metacarpophalangeal joints. The heads of the metacarpals alter the angle of pull of these muscles causing the applied force to adduct the fingers (pull fingers II, IV, and V toward finger III in the frontal plane).

Example 3: Figure 13 depicts the belly of the middle deltoid muscle as it passes over the shoulder joint. The head of the humerus causes an improved angle of

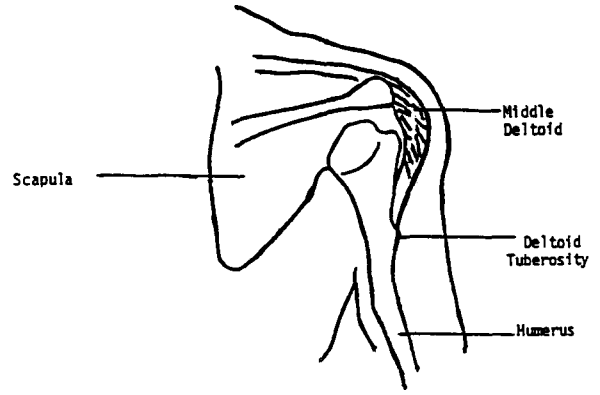

Figure 13. Shoulder joint acting as pulley for middle deltoid muscle.

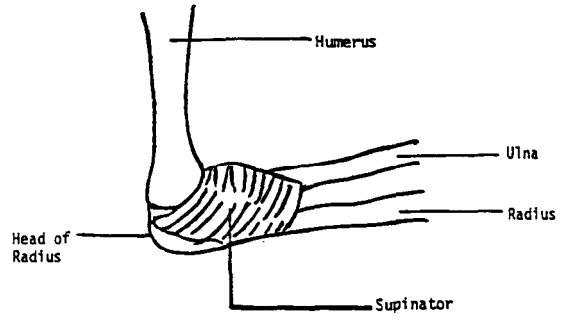

Figure 14. Head of radius acting as pulley for supinator muscle as it pulls on radius.

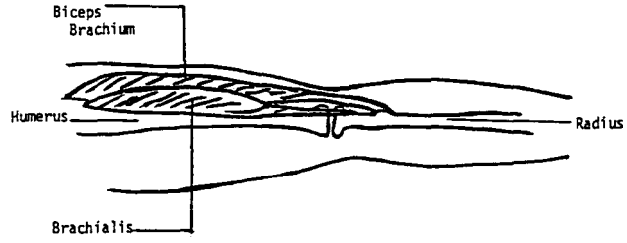

Figure 15. Increased size of brachialis and biceps brachium acting as pulley for biceps brachium.

insertion on the deltoid tuberosity of the humerus resulting in abduction of the shoulder joint (lifting the upper arm away from the midline of the body in a frontal plane).

Class IV Pulleys

In this class the muscle wraps around the pulley causing the pulley to rotate. Figure 14 depicts the supinator muscle wrapping around the head of the radius. In this example the pulley action is not to gain a more favorable mechanical advantage, but to cause the pulley to rotate. Mechanical advantage can only be increased here by having a bone with a larger cross sectional area (radius).

Class V Pulleys

In this case the muscle acts as its own pulley. Figure 15 depicts the biceps brachium muscle with the elbow extended. As this muscle increases in size, it not only becomes stronger but the angle of insertion increases slightly. Added to this is the probability that when the brachialis, which is a bulky muscle underneath the biceps brachium, is increased in size and strength, this also will elevate the biceps brachium slightly.

Summary

Five classes of pulleys which increase the mechanical actions at certain joints have been discussed. Is it not reasonable to conclude that these advanced, complex devices did not develop by random accidents by unthinking molecules, but are the result of the planned thinking and workmanship of a Divine Designer?

Wheel and Axles in the Human Body

Many of us depend on our automobiles daily. We would never arrive at our destinations if it was not for the wheels and axles functioning in our cars. The "designing" of various wheels and axles provides us with an enormous mechanical advantage in performing physical work.

In the human body there are also examples of the bones functioning as wheels and axles. The following is one bodily example:

1. The shoulder girdle (top wheel). This oblong ring of bones consists of:
   A. the two scapulae (shoulder blades)
   B. the two clavicles (collar bones)
   C. the manubrium of the sternum (breastbone)
2. The rib cage. This consists of 12 pairs of ribs which are attached to the sternum in front and the vertebral column in back.
3. The vertebral column (axle). This is a row of 26 bones which attaches the skull to the pelvic girdle.
4. The pelvic girdle (bottom wheel). This consists of two hip bones and the sacrum bone of the vertebral column.
5. The muscles that attach to the shoulder girdle, vertebral column or rib cage and pelvic girdle (pulling force).

Figure 16 depicts the shoulder girdle, vertebral column and pelvic girdle acting as a wheel and axle.

The shoulder girdle with its accompanying rib cage acts as the top wheel. The vertebral column acts as the axle. The pelvic girdle acts as the bottom wheel. In trunk twisting exercises, the oblique abdominal muscles pull on the trunk as though it were the rim of a wheel, and the trunk rotates in the direction of the pull. This permits various pivots and twists to be performed by dancers, gymnasts, divers and workers. The wheel and axle system in the human body is even more versatile than the wheel and axle in our automobiles, for the wheels in the human body can twist in opposite directions at the same time.

This is just one of the examples of the bony structures acting as a wheel and axle in the body. Actually, all rotation movements around joints with two exceptions (protraction and retraction of the shoulder girdle) are wheel and axle movements. Movements like forearm pronation in badminton and medial rotation of the shoulder joint in throwing are sport-related activities utilizing a wheel and axle mechanism. Use of the wheel and axle arrangement by body structures is a great advantage in producing speedy segmental movement for all throwing and striking activities. These examples of wheel-axle mechanical advantages of human movement are indications of planned design and purposeful function by a Designer rather than the unplanned, random reactions of unthinking physiochemical forces over alleged vast periods of time.

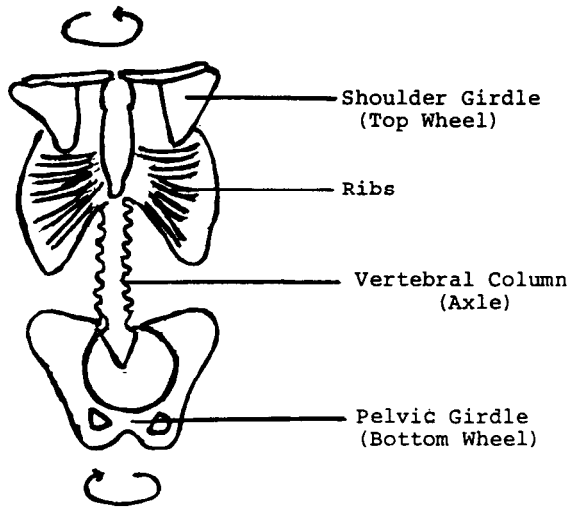

Figure 16. Shoulder girdle, vertebral column and pelvic girdle acting as wheel and axle.

Reducing Friction in the Body

You might remember a television commercial by Shell Oil Company in which their representative tells how their engineers have developed discs of lubrication that are placed between the body and chassis of giant railroad freight cars. As the joints are pressed together, the lubrication squirts out and decreases the friction of the joint system. The Divine Designer has devised this same principle in certain joints of the human body. Tiny sacs containing synovial fluid are situated in certain joints to perform the same function of the lubricating discs of the Shell Oil Company. These discs are called bursae, and if anyone has ever had bursitis, they know how important these discs are. These bursae are situated where ligaments, muscles, skin, tendons or bones overlie each other and rub together. They perform the exact same function of the Shell lubricating discs of railroad cars, i.e., reduce the friction from rubbing.

It is logical to conclude since some brilliant engineer devised and made functional these lubricating discs that reduce friction in giant railroad freight cars, that some Supreme Being Engineer devised and made functional the lubricating bursae that reduce friction in the joints of humans. If the lubricating discs in man came about by chance factors over a long period of time, why did not the Shell Oil Company just wait for the same thing to happen in lubricating the chassis of railroad freight cars instead of hiring an analytical and creative human engineer to design the system? They could have saved considerable money if this were possible. Of course, it is impossible, and this is why the creation model is best for explaining both the complex functional apparatus in both railroad freight cars and the human joint system.

Tension and Compression in Bone Tissue

When an engineer designs a structure to withstand disrupting and crushing forces, he devises the structure to include stays which resist tensile forces and struts to resist compression forces. Human bone is so constructed that it can resist both tensile forces and compression forces. Its marrow cavity, endosteum and compact bone system provide for resistance to tensile forces while its periosteum with its outer fibrous layer and inner osteogenic layer provides resistance to compression forces. Hence, bone shows considerable structural advantages over many constructional materials, such as cast and wrought iron and wood, which are strong in resisting tensile forces but weak in resisting compression forces. Bell (1941, pp. 298-317) has shown the tensile strength of bone by experimental studies on rats to be 35,000 lb/in^2 in average breaking stress to bending as compared to 40,000 lb/in^2 for cast iron. Bone has an advantage over cast iron, because it is three times lighter and much more flexible. Clark (1971, p. 102) has claimed that bone material is three times as strong as timber and half as strong as mild steel. In comparing bone to other materials, Shipman et al. (1985, p. 53) reported that "porcelain and other ceramics have tensile strengths ranging from about one-third to one-half that of bone." In light of these facts, a person must ask himself, "If a civil engineer designed the superior structures of steel beams and the like, did not some Superhuman Engineer design the superior material and structure of our human bone system?" Also, the mineral and protein components of bone tissue, taken separately, are both weaker (both in compression and tension) than the actual combination of these components. How could a slow process of evolution lead to this combination? How would animals survive maximal stresses on their bones over billions of years of a snail's pace development of compression and tension?

The Creative Superiority of the Human Brain

Animal brains and human brains have many structural and functional similarities. However, there are some large, significant differences. First, the human brain has a larger and better developed frontal lobe—approximately one-half of the volume of the cerebral cortex consists of the frontal lobe. The frontal lobe in humans regulates muscular and mental functions. Therefore, it can be divided into motor, pre-motor and prefrontal areas which are immediately behind the forehead and eye sockets. It is this latter pre-frontal area that give humans mental superiority over lower animals. The pre-frontal cortex barely exists in rats and mice; in cats and dogs it makes up 3.5 and 7 percent of the cerebral cortex respectively. The pre-frontal cortex of chimpanzees consists of 17 percent of their cerebral cortex. In humans the pre-frontal cortex consists of a "whopping" 29 percent—almost one-third of the entire cerebral cortex. It is this expanded, well-developed pre-frontal area that makes humans superior to other animals in memory functions, planning controls, feedback and inhibitory controls on behavior.

Second, the human brain has a significant enlargement and development of areas known as the association cortex. It is these areas located within the cerebral cortex that allow humans to connect the experiences of life into a meaningful whole and relate them to self for a greater perception of the world and personal awareness. Sensations and memory are integrated and soon connect reason, language and ideas into meaningful experiences.

Third, the human brain has a unique area (Broca's area) designed to produce and perceive speech. A speech area has never been discovered in any animal, and, indeed, no animal possesses the language and communication abilities of humans.

Evidence of the evolutionary development of lowly developed animal brains into highly developed human brains is non-existent. The vast jump of development from non-human primate brains to the complex frontal lobes, highly specialized association areas and unique speech areas of the human brain is so great that it defies any comprehension of evolutionary logic.

Cosgrove (1987, p. 164), a professor and chairman of psychology at Taylor University, has summarized the situation as follows:

> Without the evidence of gradual approximations of the human speech center in the animal world, the development of human speech from the animals is a mystery to biologists. Though weak, the best explanations are that gestures were replaced by single sounds or that men began to imitate sounds in their natural environments. The complexity of all human languages (past and present), the neurological complexity required to produce grammatical knowledge in the child, and the complexity of neurological control over auditory and musculature systems required for speech make these explanations appear absurd. If we are honest, we will face the facts and admit that we can find no evolutionary development to explain our unique speech center.

Common Sense and Scripture

If a precise-working automobile presupposes an automaker, surely the infinitely more complex and intricate structures of the human body infer a body maker. The psalmist says: "Understand, ye brutish among people and ye fools, when will ye be wise? He that planted the ear, shall He not hear? He that formed the eye, shall He not see" (Psalm 94:8, 9)? Here Scripture infers that the eyes and ears were planned and created to provide accurate sensory function for us humans. It also infers that the evolutionary concept of undirected, random particles evolving into organized structures is humanistic foolishness (brutish, unwise). Solomon, the wisest king, stated, "The hearing ear, and the seeing eye, the Lord hath made even both of them" (Proverbs 20:12).

The most basic of all scientific laws—the law of cause and effect (no effect can be greater than its cause)—becomes foolishness to those who believe that matter can organize itself into highly functional living structures by chaotic chance factors.

Every organism, from the single-celled microbe to the amazing human body carries the imprint of intricate planning and construction. The idea that such complex structures did evolve by random mutations and natural selection is clearly a measure of the arrogance of human rebellion against common sense and the absurdity of humanistic logic. Such things never happen in the real world, and there is little or no real scientific evidence

whatever for "upward" evolution from one kind of lower organism to a higher organism. The only genuine force for the belief in evolution is the fact that the intellectual leaders want to believe it. The main reason they believe it is their fanatic desire to escape the idea that there is a Creator Who is more intellectual than they. "Professing themselves to be wise, they became fools" (Romans 1:22).

The ear did not accidently "evolve" into its design; it was designed by a Master Architect. The eye did not "occur" by chance: it was planned by a Master Planner. Common sense and Scripture both point to the development of living organized structures by creative acts of a Superhuman Intelligence.

Anatomy and Scripture

There are over 100 references to the word "body" in the Bible, but most of these references are not in an anatomical sense and hence will not be noted. However, there are two significant anatomical references in the Scriptures.

We observe that the human body demonstrates an organized plan of symmetry with a certain degree of variation from symmetry. When my students stumble across some violation of symmetry, for instance the azygos vein, which is an unpaired vein on the right side of the thorax, and ask why there is only a miniature hemiazygous vein on the left side of the thorax my typical reply is "That's the way God made it." If we look at I Corinthians 12:18, we learn "As it is, however, God put every different part in the body just as He wished? Here the Creator tells us that He designed the structures of our bodies and placed them into an organized plan with a certain degree of variation for his own purposes. We humans do not know why he decided to place a large azygos vein on the right side and only a miniature hemiazygos vein on the left side. But we do know that he planned our bodies for His own individual reasons. He did not allow it to develop by chance factors as evolutionary theory maintains. The answer I give my students not only answers their question with some satisfaction, but it is scripturally correct. The students realize that there are some academic questions that the best scholars do not know, and we realize that our bodies were created or conserved this way because our Divine Designer just decided to do it this way. Science has very real limitations, and once we realize this, our emotional and spiritual lives receive a certain degree of enrichment.

Another specific reference to anatomy in Scripture is Colossians 2:19b, "Under Christ's control the whole body is nourished and held together by its joints and ligaments, and grows as God wants it to grow." Here we are told that the power of Christ has set up the principles of nutrition and growth. The structure and function of the joints and ligaments were made to suit God's purpose, and were not due to some chance happening. Here again supernatural design is clearly emphasized. The earlier context (Colossians 2:16-19a) claims that making strict rules about eating, drinking, and holy days are not in accord with God's purpose and should be avoided by the Christian. However, the Creator has given us, the Body of Christ, certain rules of nutrition and growth to live by, and we are not to violate them. . .

Argument for a Designer

It is ironic that the purpose of most scientific experimentation is to determine the mechanism or cause of some phenomenon, but when it comes to the origin of life and the universe most scientists abandon the principle of causality and adhere to the principle of randomness. Should natural phenomena be causeless, an infinite number of causes is an absurdity. Unless we abandon the principle of causality completely, we are driven to recognize an Infinite First Cause, the Triune God.

In all realms of science there is a recognition of laws and principles. In our human sphere, all civil laws are made by some lawmaker. Is it not logical to conclude that since persons and minds make civil laws here on earth, the existence of natural laws implies a Supernatural Lawgiver? How can a law make itself?

In essence, the argument for evolution is based on random physiochemical forces acting over immense periods of time; the argument for Creation is based on planned, purposeful design by a Divine Designer. In studying the human body anatomically one is impressed with its high degree of design. The greatest digital computers developed by our superior scientific minds are simple machines when compared to the very complex human nervous system.

Summary

Anatomy, the study of the structure of the body is a dynamic academic discipline. In the mechanical area of the world, thinking, creative human engineers design and develop newer, better forms of simple machines that perform work more efficiently. Human anatomists have discovered in the body examples of pulleys, wheels and axles, friction reducing fluid filled sacs within joints, compression and tension abilities of bone, and the creative superiority of the human brain. The question is, "Could undirected, randomized energy (chaos) through physio-chemical laws design and develop these precise functioning examples of simple machines in the human body? An unbiased observer would have great difficulty denying the rationality of inferring that these highly designed mechanisms were designed by an outside intelligent agent (Logos) which we would call the Creator of the universe. There certainly is anatomical evidence for the creation model of origins.

References

CRSQ—Creation Research Society Quarterly.

Bell, G. H., D. P. Cuthbertson and J. Orr. 1941. Strength and size of bone in relation to calcium intake. *Journal of Physiology* (London) 100:298-317.

Clark, W. E. L. 1971. The tissues of the body. Clarendon Press. Oxford.

Coleman, J. 1978. The function of anatomical pulleys. Proceedings of Kinesiology: A national conference on teaching. Edited by C. Dillman and R. Sears. University of Illinois. Urbana.

Cosgrove, M. P. 1987. The amazing body human. Baker Book House. Grand Rapids.

Holroyd, H. B. 1975. Arguments against symmetry and design from chance events. *CRSQ* 12:95.

Kaufmann, D. A. 1974. Design in the human body. *CRSQ* 11:91-94.

Newton, I. 1952. Mathematical principles of natural philosophy: Optics. In Great books of the Western World. Volume 34. William Benton. Chicago.

Shipman, P., A. Walker, and D. Bichell. 1985. The human skeleton. Harvard University Press. Cambridge, MA.