

# MARVELS OF CREATION & SCIENCE

—by Peter Hammond

*“But now ask the beasts and they will teach you; and the birds of the air, and they will tell you; who among all these does not know that the hand of the Lord has done this... with Him are wisdom and strength, He has counsel and understanding.”* Job 12:7-13

There is much in modern technology that is marvellous. Yet, the incredible complexity and intricacy of God's Creation is infinitely more marvellous. For centuries, men dreamed of flying. However, men do not have muscles powerful enough to lift their own body weight into

the air. In 1876 Nikolaus Otto built an internal combustion engine.

The brothers Wilbur and Orville Wright had wanted to fly ever since they had played with kites as boys. Later they learned engineering skills by building bicycles. They realised that the key chal-

lenge of flight was to design a craft that could be controlled. A plane that could

### Learning from the birds

not be balanced in the air is as useless as a bicycle that cannot be steered. Wilbur watched birds in flight and noticed how they bank into a turn, as a cyclist does. In 1900 Wilbur and Orville built an aircraft with twistable wings. They flew it first as a kite and then later as a piloted glider. They discovered that an aircraft needs three basic controls - to adjust pitch, roll and side to side movement. However they were frustrated that the wings did not produce enough lift.

The Wright brothers built a wind tunnel and experimented with hundreds of wing shapes until they found the ideal shape, size and angle.

In 1902 with a new design they mastered the art of balancing the aircraft on the wind. Now they needed to mount an engine on it. With the knowledge they had gained with their wind tunnel, they designed a propeller. They also had to build their own engine. Finally in 1903, the Wright brothers started the engine, the propellers spun and the aircraft lifted off. This introduced the age of flight.

As the brothers became international celebrities, they pointed out that God's Creation taught them all the principles of flight. The Word of God says: *“But now ask... the birds of the air and they will tell you... the hand of the Lord has done this...”* Job 12:7-9

### Intelligent design

It is apparent that everything about birds is designed for flight. The wings of birds are

so light, yet very strong. The shafts of wing feathers support a bird's entire weight during flight. How can they be so light, yet so strong? If you cut through the shaft of a feather you will see an engineering masterpiece. The shafts of feathers have a foam sandwich of cross beams which strengthen the light design. Engineers have studied the shafts of bird feathers and used the foam sandwich design in aircraft.

The bones of birds are hollow and, in many cases, are strengthened by internal struts in a form which engineers call the warren girder. When engineers designed the wings of the space shuttle they incorporated these features that have been observed in the bones of birds.

### Control and energy

Pilots balance modern aircraft by adjusting flaps on the wings and tail. The average bird uses some 48 muscles in its wings and shoulders to change the con-

figuration and motion of its wings and individual feathers. Birds can make multiple adjustments several times a second. Eagles and falcons are the example and envy of aircraft designers.

Flight, especially during takeoff, consumes a lot of energy, so birds need a

*“For since the Creation of the world, His invisible attributes are clearly seen, being understood by the things that are made...so that they are without excuse.”* Rom 1:16-20

powerful, fast burning engine. A bird's heart beats faster and is usually larger and more powerful than that of a similar sized mammal. Also, the bird's lungs have a different one-way flow design that is more efficient than the lungs of mammals.

One measure of an aircraft's efficiency is whether it can take off carrying sufficient

fuel. When a Boeing 747 takes off for a ten hour flight, roughly one third of its weight is fuel. Similarly a migrating thrush may lose almost half of its body weight on a ten hour flight.

### The Swallow

The barn swallow is one of the wonders of God's Creation. At 18g it is one of the smallest migrating birds. The average barn »

**As the Wright brothers became international celebrities they pointed out that God's Creation taught them all the principles of flight.**

the air. In 1781 James Watt invented a steam engine that produced rotary power.

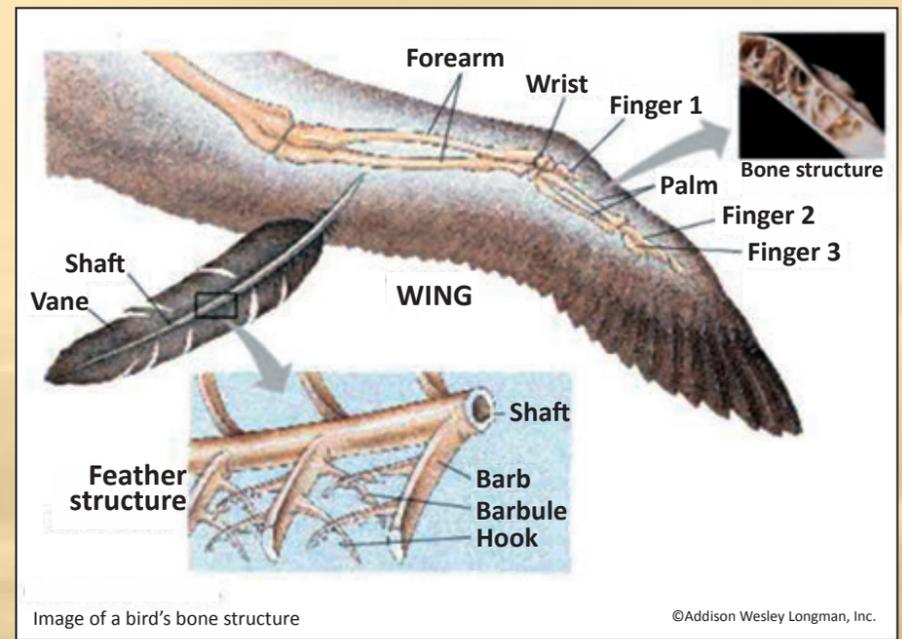
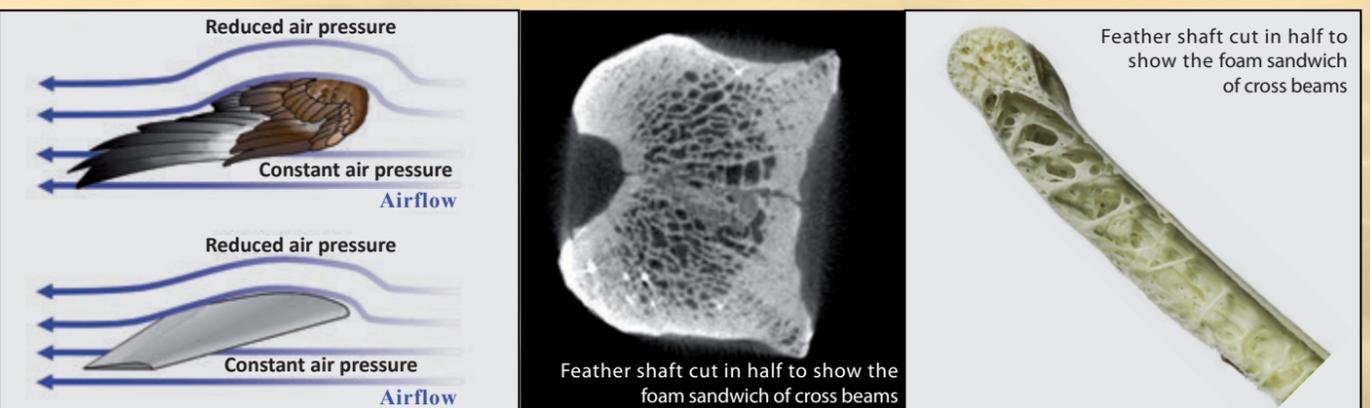


Image of a bird's bone structure

©Addison Wesley Longman, Inc.





# MARVELS OF CREATION & SCIENCE



swallow flies 12 000km annually. It leaves Europe during its August/September Autumn each year to spend its summer in the Southern Hemisphere. The barn swallow breeds in Europe, but spends summer in South Africa.

Barn swallows fly up to 50km a day, even when at home, to forage. They serve God and people by controlling the aerial insect populations (including mosqui-

a compass does not help unless the navigator knows what his position is in relation to his destination. Not until the invention of the sextant and the marine chronometer in the 1730s could navigators determine their exact location and plot their course on a map. Each fix required hours of calculation.

### God's positioning system

However, today, motorists in many countries navigate using a Global Positioning System (GPS). Originally designed in the 1960s for military use to guide, for example,

the GPS is clearly not the first automatic navigation device.

### Amazing skills

Jeremiah wrote about the migrating of the storks and swallows over 2 500 years ago. Today people still marvel at creatures that migrate. *"Even the stork in the Heavens knows her appointed times; and the turtle dove, the swift, and the swallow observe the time of their coming"* Jeremiah 8:7.

Consider the salmon which can swim thousands of kilometres in the ocean and return to the stream where they were born. Leatherback sea turtles have made incredible journeys. One that nested in Indonesia was tracked as it migrated 20 000km to the coast of Oregon in the United States! Leatherback turtles often return to the same area of Indonesia to nest again.

Monarch butterflies from vast areas of North America migrate more than 1 700km to a small area of Mexico. Even though they have never been to Mexico before, they find their way, often to the same trees where their great grandparents roosted the previous year. Just how they do it still baffles researchers.

### Finding home

Pigeons have been transported more than 150km to unfamiliar places, while under deep anaesthesia, or in rotating drums. Yet, after circling a few times, they have calculated their position and turned accurately towards home. As researchers have even gone so far as to force these pigeons to wear frosted eyeglasses, they believe that pigeons calculate their position in relation to home by detecting the directions by

which they receive important navigational information.

Scientists took 18 albatross by plane from a small island in the centre of the Pacific Ocean to several locations, thousands of kilometres away and released them. Some were taken to the Western rim of the Pacific Ocean, others to the Eastern rim. Yet within a few weeks, most of the albatross had returned to their small island in the centre of the vast Pacific Ocean!

### Sophisticated navigation devices invented by God

Whereas our automatic navigation devices may depend totally on satellites, many animals seem to be able to use various navigational methods – from observing landmarks and the sun to detecting magnetic fields, distinctive smells and even sounds.

Biology professor James Gould wrote: "Animals whose lives depend on accurate navigation are uniformly over engineered...they usually come equipped with alternate strategies – a whole series of backups, between which they switch depending on which is providing the most reliable information." The sophistication of animal navigation continues to confound scientific investigators.

### God's communication system

In 1973 Dr. Martin Cooper was the first to demonstrate a hand held cellular telephone. It had a battery, a radio and a microprocessor (a mini computer). New Yorkers were stunned to see Cooper making a phone call on the street. This invention was only made possible because of previ-

ous inventions: the invention of a reliable battery by 1800, the development of the telephone by 1876, the radio by 1895 and the computer by 1946. The invention of the microprocessor in 1971 made cell phones possible.

However, communication with sophisticated devices was not actually that new. Since the dawn of Creation a communication device, which has often been taken for granted, is the human voice. Over half of the billions of neurons in the motor cortex of your brain are involved in controlling

roughly what distance, a sound comes from. These are just two of the features that enable you to listen to one person at a time even though several others may be speaking in the background. So, sophisticated wireless communication with caller recognition is not that new. It is first found in how God created us.

### God's tele-visual technology

Soon after men learned to broadcast sound, inventors wondered if they could also transmit live pictures. To appreciate

The sophistication of animal navigation continues to confound scientific investigators.

toes). Their migratory journey from Kwa-Zulu Natal to Germany may take a month. They fly an average of 400km a day. Approximately three million barn swallows migrate between South Africa and Germany each year.

### God-given endurance

When a bar-tailed godwit takes off from Alaska, heading for New Zealand, over half its body weight is fat. Astonishingly this bird flies for over 190 hours (eight days) non-stop! No commercial aircraft can do that.

Perhaps you have had the problem of finding your way across an unfamiliar town. Even with maps and directions you can get lost. So how do navigators find their way across featureless oceans? Merely having

cruise missiles, the GPS was later made available to the public, becoming fully operational in 1996. The GPS is a marvel of computer technology. The device can show your exact location on the screen and guide you to the address where you want to go.

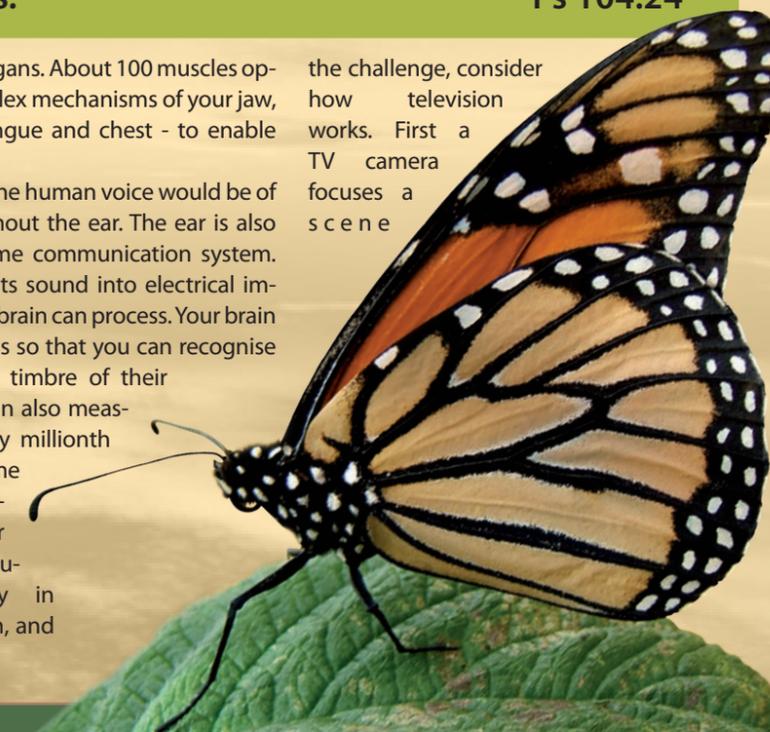
Satellite navigation devices depend on about 30 satellites that each broadcast signals indicating the satellite position, distance and time, to an accuracy of a few billionth of a second. Once your GPS has established contact with three satellites, it accurately measures how long a signal takes to travel from the satellite to your receiver. This requires complex calculations. In a few seconds a GPS computes the distance to three satellites, all thousands of kilometres away, travelling in different directions, at speeds of many kilometres per second. Yet

*"Oh Lord, how manifold are Your works! In wisdom You have made them all. The earth is full of Your possessions."*  
Ps 104:24

your speech organs. About 100 muscles operate the complex mechanisms of your jaw, throat, lips, tongue and chest - to enable you to speak.

Of course, the human voice would be of no benefit without the ear. The ear is also part of the same communication system. The ear converts sound into electrical impulses that the brain can process. Your brain analyses sounds so that you can recognise people by the timbre of their voice. Your brain also measures how many millionth of a second one ear hears before the other and thus calculates precisely in which direction, and

the challenge, consider how television works. First a TV camera focuses a scene



# MARVELS OF CREATION & SCIENCE

onto a target device that reads the picture. Instead of reading lines of letters on a page, as we read books, the television scans lines of spots, or pixels, in the picture. It converts these pixels into an electronic video signal that can be transmitted to another place. A receiver then converts this electronic signal back into a live picture.

John Logie Baird has been credited as the inventor of television. When poor health caused him to give up his job as an

across the Atlantic.

However, this was not the first time that live pictures were ever transmitted.

### Intricacy of the eye

*"The hearing ear and the seeing eye the Lord has made them both."* Prov 20:12. Your eyes are like tiny television cameras. They convert images into electrical signals and transmit these signals along the optic nerve to the back of your brain, where the actual seeing takes place. The eye is

after entering a dark room your eyes may become ten thousand times more sensitive to light. Your eye has over one hundred times more light sensitive cells (pixels) than most video cameras. Electrical signals from the light sensitive cells pass from one nerve cell to another towards the optic nerve. But the nerve cells do far more than just pass the signals on. They process the images, enhancing vital information and suppressing unneeded details.

The visual cortex of your brain is a live sophisticated video receiver. It sharpens images by enhancing edges, and compares the signals from cells sensitive to primary colours so that you can distinguish literally millions of shades of colour. Your brain also compares the tiny dissimilarities between what your two eyes see, so that you can perceive distance and depth.

### Incredible design

Consider how your eyes scan faces in a distant crowd and send electronic impulses to your brain, which then transforms the signals into clear images. Consider how subtle details of these faces are compared with ones in your memory, so that you instantly recognise your friend. Is that process not awe inspiring?

*"Oh Lord, how manifold are Your works! In wisdom You have made them all. The earth is full of Your possessions."* Ps 104:24

Frequently one reads in secular humanist scientific journals, which purport to believe in Evolution, statements such as this: "Of all the body coverings nature has designed, feathers are the most various and the most mysterious." According to the Oxford Dictionary, design means: to "plan something with a specific purpose or intention in mind."

Secular humanists who believe in Evolution frequently refer to 'Nature' designing things. Although they may claim that they

believe Nature is a mere force, they attribute intelligent design to it. Can an impersonal force design things?

### The Creator has a Name

What many Evolutionists refer to as nature we know to be Creation. And the Creator does have a Name.

*"For I am not ashamed of the Gospel of Christ, for it is the power of God to salvation for everyone who believes...for the wrath of God is revealed from Heaven against all ungodliness and unrighteousness of men who suppress the truth in unrighteousness, because what may be known of God is manifest in them, for God has shown it to them. For since the Creation of the world, His invisible attributes are clearly seen, being understood by the things that are made, even His eternal power and Godhead, so that they are without excuse."* Rom 1:16-20

From nature we learn that God's wisdom is superior to ours. If God can design things better than inventors can, does it not stand to reason that He can advise us better than human counselors can?

As Francis Bacon, the father of the Scientific method once put it: "There are two books laid before us to study, to prevent us falling into error; first the volume of the Scripture, which reveal the Will of God, then the volume of the Creation, which express His power."

### Thinking God's thoughts after Him

The great Astronomer, Johannes Kepler (1571-1630), viewed all science as man attempting to "think God's thoughts after Him". Sir Isaac Newton (1642 - 1727), the father of Calculus and Dynamics maintained that there were two key sources of knowledge - one revealed in the Bible and the other revealed in nature. Newton believed that one must study the Word of God (the Bible), and the works of God (Creation).

### Listen and learn from the Creator

The designer of our organs for communication obviously wants to communicate with us. If we find learning about inventors interesting, we will find that learning about the Creator is far more fascinating. Whether they acknowledge it or not, scientists have learned design from our Creator God. God speaks to us through General Revelation in Creation and through Special Revelation in the Bible.

When we study His works in the light of His Word we come to understand the God of Creation: "God, who at various times

DR. PETER HAMMOND has pioneered missions to Mozambique, Angola and Sudan. He is the author of *Faith Under Fire in Sudan*. Tel: 021 689 4480; [missions@frontline.org.za](mailto:missions@frontline.org.za) or [www.frontline.org.za](http://www.frontline.org.za)

If we find learning about inventors interesting, we will find that learning about the Creator is far more fascinating.

electrical engineer, he devoted his time to a subject which had fascinated him since he was a teenager - how to build a machine that could transport live images. Baird's television camera used a hatbox, perforated by thirty holes, as a disc. As the disc spun, the holes scanned successive lines of the picture and they allowed light to fall onto a photoelectric cell.

### Man's invention, God's creation

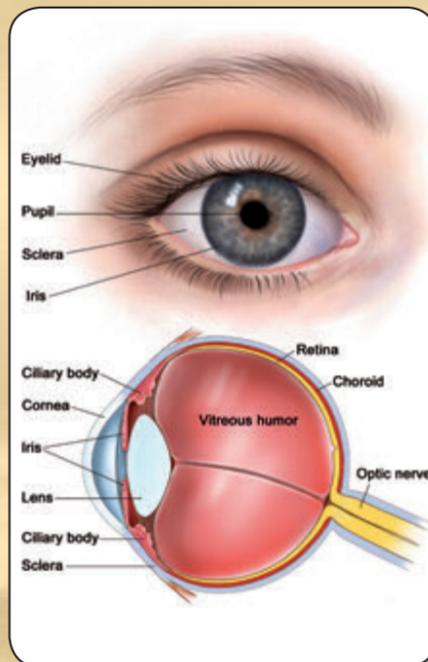
The cell produced a video signal that was transmitted to a receiver. In the receiver the signal was amplified to illuminate a variable light behind a similar spinning disc to reproduce the picture. The challenge was to synchronise the discs.

To support himself while working on this project, Baird raised funds by polishing shoes. On the 2<sup>nd</sup> October, 1925, Baird transmitted the first television picture from one end of his attic to another.

The first person ever to appear on television was a frightened office boy from downstairs. He was paid half a crown for his services. In 1928 Baird broadcast the first television pictures

a magnificent marvel in miniature. Just 24mm in diameter and 7.5g in weight, the eye is ingeniously engineered.

For example, it has separate systems for dim and bright lighting. Thirty minutes



Be Equipped to Win The Battle for Hearts and Minds

**R195**

Dr D James Kennedy answers skeptics toughest questions and shows how Christianity is based on historical and concrete evidence.

**Book and DVD R180**

The most inspiring and powerful presentation of the Greatest Man who ever lived and how His life and teachings have positively impacted every area of life.

**CHRISTIAN LIBERTY BOOKS**  
 PO BOX 358 HOWARD PLACE PINELANDS 7450  
 Cape Town TEL/FAX : 021 689 7478  
[admin@christianlibertybooks.co.za](mailto:admin@christianlibertybooks.co.za)  
[www.christianlibertybooks.co.za](http://www.christianlibertybooks.co.za)