Drop in testosterone led to mankind's Great Leap Forward 50,000 years ago

by Josie Webster for Ancestry - Genealogy & DNA

A new study has suggested that a decline in testosterone levels in modern humans feminized their features and behaviour, paving the way to modern civilization.

The study, led by biologist Robert Cieri of the University of Utah, examined over 1,400 modern and ancient skulls and found that around 50,000 years ago heavy brows started to phase out and skulls became rounder.

This coincides with what some anthropologists believe was an explosion of cultural creativity by Homo sapiens, known as the Great Leap Forward or the Upper Paleolithic Revolution, which led to finely-made tools, figurative art, long-distance networking and the development of natural languages. It also marks modern human expansion into previously unexplored environments across the planet, such as Australia and Northern Eurasia. They believe this change in behaviour is what distinguishes present day humans and their recent ancestors from other living primates and extinct hominid species, such as the Neanderthals or Homo erectus.

Cieri said: "Human fossils from after modern behaviour became common have more feminine faces, and differences between the younger and older fossils are similar to those between faces of people with higher and lower testosterone levels living today."

http://www.abroadintheyard.com/drop-in-testosterone-led-to-mankinds-great-leap-forward-50000-years-ago/

also on the list

The great leap forward. Major evolutionary jumps might be caused by changes in gene regulation rather than the emergence of new genes

the Mossel Bay mild climate and seafood, not only saved humanity from extinction, but was responsible for humankind's speedy brain, intelligence, consciousness, growth and indeed the "**Great Leap Forward"**

So question is, when did these symbolic practices start to define humanity? There is no easy answer, and we may never gather enough evidence to come up with a definitive timeline. But there are two broad theories about how it happened. One suggests humanity made a great cultural leap forward roughly 80-60 thousand years ago, during the "revolution" when humans hightailed it out of Africa and into Eurasia. And the other suggests culture evolved gradually, in Africa, over *Homo sapiens*' entire species lifespan.

https://io9.gizmodo.com/the-mystery-of-the-human-intelligence-explosion-1477208203

Child Receives Transgenic Skin Over Most of His Body November 8, 2017

A combination gene-and-cell therapy has given a boy with a grievous skin disease a new lease on life, and has resolved a dermatology debate to boot.

A biopsy was taken from what remained of the boy's undamaged epidermis and, from this, keratinocytes were extracted, expanded in culture, and then transduced with a retroviral vector carrying the full-length, healthy version of the laminin b3 coding sequence. The cells, which grow as sheets, were then further expanded until enough sheets were produced to cover the boy's limbs and torso. They were transplanted in two operations performed in October and November of 2015. A third, smaller operation in January of 2016 filled in most of the remaining gaps.

He's back to school, he's exercising, he's started to play soccer . . . it's quite amazing.

—Michele De Luca, University of Modena and Reggio Emilia

http://www.the-scientist.com/?articles.view/articleNo/50911/title/Child-Receives-Transgenic-Skin-Over-Most-of-His-Body/&utm_campaign=NEWSLETTER_TS_The-Scientist-Daily_2016&utm_source=hs_email&utm_medium=email&utm_content=58271106&_hsenc=p2ANqtz-9pX8Xkv1NowRxOv_vUN1j4TcNf9xjWgVIbWbkXWeQiNzOLUE2Um80CqsQxOn_f_F2MWalGeIcbSw_zaHPoYpMAly-11w&_hsmi=58271106

Chromosomes

Chimpanzees, gorillas, orangutans all have 24 pairs of chromosomes.

Humans have 23 - why the difference?

Our Chromosome #2, the second biggest of human chromosomes, is in fact formed from the fusion of two medium sized ape chromosomes.

There is no bone in the chimpanzee body that we do not have.

No chemical in the chimpanzee brain that is not found in the human brain.

No known part of the immune system, digestive system, vascular system, lymph system, or nervous system that we have and chimps do not, or vise versa.


FAMILY HOMINIDAE
Man
Subfamily P

Human uniformity!

There is an unusually high level of genetic uniformity in the human species.

Compare protein molecules from blood samples or sequence the genes them selves you find there is less difference between any two humans living anywhere in the world than there is between two African chimpanzees.

Genetic bottleneck

The explanation for this is that the population was reduced to a small number, came close to becoming extinct but just pulled through.

There is evidence of a fierce bottleneck some 70, 000 years ago caused by a six-year volcanic winter followed by an thousand year ice age. The population is estimated to have been reduced to some 15, 000 humans.

There is no such thing as race!

We are 99.9% alike!

University of Miami researchers ID Alzheimer's risk gene

BY FRED TASKER, MiamiHerald14 April, 2010

* Senior moment or memory roulette?

University of Miami researchers have identified a gene that appears to double a person's risk of developing late-onset Alzheimer's disease. They called the finding a small step toward understanding and fighting the debilitating disease, which affects five million Americans.

http://www.miamiherald.com/2010/04/14/1578588/university-of-miami-researchers.html

Controversial DNA swap could prevent inherited disease
LA Times - April 17, 2010

British scientists, using a variation of the technique used to clone Dolly the sheep, say they've mastered exchanging DNA between two fertilized human eggs as a way to prevent mitochondrial diseases.
Lead researcher Doug Turnbull of Newcastle University said this week that he hoped the first babies free from so-called mitochondrial diseases would be born within three years.

The technique replaces mitochondrial DNA, which is passed down the maternal line. One in 6,500 children is born with serious diseases caused by malfunctioning mitochondrial DNA.

A family that walks on all fours.

Gene-Therapy Trial Offers Parkinson's Patients New Hope

Trial Marks Important Milestone for Historically Controversial Approach

BY KATIE MOISSE, ABC NEWS MEDICAL UNIT

March 17, 2011

Walter Liskiewicz, an oral surgeon in Jackson, Mich., was 44 when he lost control of his body to Parkinson's disease. Fading signals from nerves dying deep inside his brain left his hands rigid and trembling and quickly forced him into early retirement. He found solace in music, writing and producing smooth jazz under the name Waldino. But within 10 years, he could barely move.

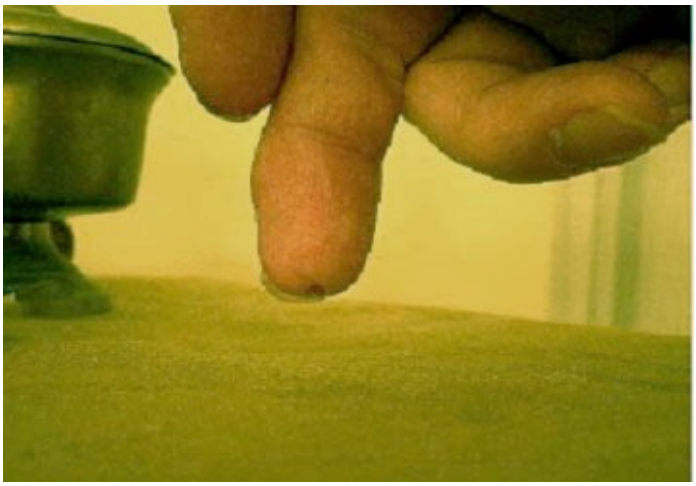
"Up to 70 percent of the time, I couldn't do anything," Liskiewicz, now 60, said. "I would sit in a chair."

But the promising results of a gene-therapy trial have offered new hope to people with Parkinson's disease. The controversial approach uses virus particles to infuse new genes into a patient's own cells.

"This opens up the field of genetic medicine and brings us dramatically closer to it being a reality than ever before," said Dr. Michael Kaplitt, associate professor of neurological surgery at Weill Cornell Medical College in New York City and senior author of a report on the trial's results published in the Lancet Neurology.

Regeneration of a human partial digit stimulated by porcine derived extracellular matrix

67 year old male accidental partial digit amputation



8 weeks after single treatment with UBM

Stephen Badylak group, University of Pittsburgh, Center of Regeneration. Collaborator of Dr. Susan Braunhut in Department of Biology.

The Search for Genes Leads to Unexpected Places

Edward M. Marcotte is looking for drugs that can kill tumors by stopping blood vessel growth, and he and his colleagues at the University of Texas at Austin recently found some good targets — five human genes that are essential for that growth. Now they're hunting for drugs that can stop those genes from working. Strangely, though, Dr. Marcotte did not discover the new genes in the human genome, nor in lab mice or even fruit flies.

He and his colleagues found the genes in yeast.

http://www.nytimes.com/2010/04/27/science/27gene.html

Genetically modified wheat used to make coeliac-friendly bread

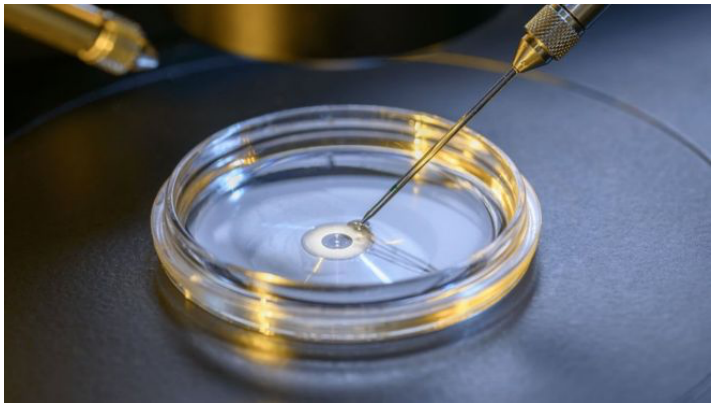
27 Sept, 2017

Gluten is the general term for all the proteins in wheat and related cereals. During baking, these proteins link up to form elastic chains, which is what holds breads and cakes together as they rise. Not all gluten proteins trigger this response, though: the main culprit is a group called gliadins. So Francisco Barro's team at the Institute for Sustainable Agriculture in Cordoba, Spain, set about getting rid of them.

Barro's team used CRISPR gene-editing to get rid of the genes entirely. This is a huge task because there are no fewer than 45 copies of the gene for the main gliadin protein that causes problems. Nevertheless, Barro's team report that they have already managed to knock out 35 out of the 45 genes.

DNA surgery on embryos removes disease

28 Sept, 2017



Precise "chemical surgery" has been performed on human embryos to remove disease in a world first, Chinese researchers have told the BBC.

The team at Sun Yat-sen University used a technique called base editing to correct a single error out of the three billion "letters" of our genetic code. They altered lab-made embryos to remove the disease beta-thalassemia. The embryos were not implanted. The team says the approach may one day treat a range of inherited diseases.

Base editing alters the fundamental building blocks of DNA: A, C, G and T. All the instructions for building and running the human body are encoded in combinations of those four bases.

The potentially life-threatening blood disorder **beta-thalassemia** is caused by a change to a single base in the genetic code - known as a point mutation. The team in China edited it back. They scanned DNA for the error then converted a G to an A, correcting the fault.

http://www.bbc.com/news/health-41386849

Nov. 1, 2017

Babies born with a previously untreatable degenerative nerve disease now have two fresh sources of hope for their future.

First, a new genetic treatment employed a DNA-loaded virus to replace the missing SMN1 gene with a fresh, healthy copy of the gene.

Second, an already-approved drug called nusinersen (Spinraza) was used to promote production of the crucial nerve protein by a backup gene called SMN2.
Both approaches increased survival in babies with SMA and preserved or improved their motor function, the researchers said.

https://consumer.healthday.com/health-technology-information-18/gene-therapy-news-331/gene-therapy-new-drug-battle-a-rare-but-deadly-disease-in-kids-728125.html

October 10, 2017
Opinion: Genome Editing of Human Embryos Broadens Ethics Discussions

http://www.the-scientist.com/?articles.view/articleNo/50589/title/Opinion--Genome-Editing-o
Human-Embryos-Broadens-Ethics-Discussions/

Genome

The human body contains about a hundred million million cells.

Each cell has a nucleus - inside the nucleus are two complete sets of the human genome.*

Each set includes the same 30 000-80 000 genes on the same twenty-three chromosomes.

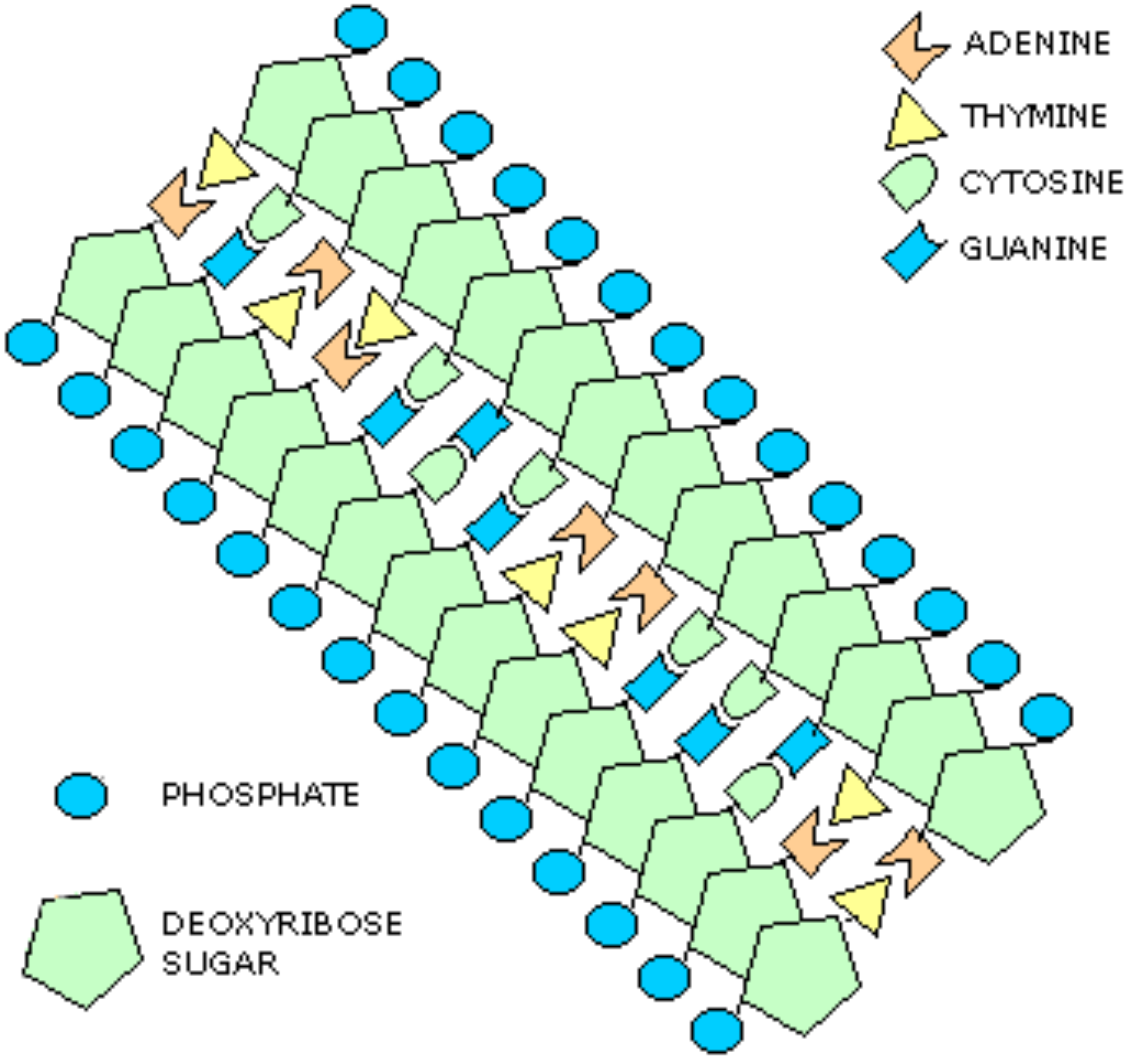
The genetic code

Written in 4 letters - A, C, G, and T

adenine, cytosine, guanine, and thymine

A likes to pair with T and G with C.

Each chromosome is one pair of very long DNA molecules ~ 3 billion bases.



http://www.biology-online.org/1/5_DNA.htm

Chromosome 4

Wolf-Hirschhorn gene - if you lack the gene you die young, a mutated version of the gene causes Huntington's disease.

The gene contains a single "word" repeated over and over again - CAG, CAG, CAG, CAG…

The repetition continues sometimes 6 times, sometimes 30, sometimes more than a hundred.

Most of us have about 10 to 15 repeats.

If the “word” is repeated more than 39 times in mid-life you will

slowly start to loose your balance,

in time jerking of the limbs,

deep depression, and sometimes hallucination and delusions.

One can no longer look after themselves and die prematurely.

39 repeats - 90% chance dementia by 75 years old with first symptoms at 66

# repeats	age at first signs
40	59
41	54
42	37

The scale is this: If your chromosomes were long enough to stretch around the equator, the difference between health and insanity would be less than one extra inch.

What so we do with the information?

Children are occasionally born with an extra chromosome 13 or 18 but seldom live more than a few days.

Children born with an extra chromosome 21 are healthy, but have what is termed Down syndrome.

Eugenics

Wikipedia - a social philosophy which advocates the improvement of human hereditary traits through various forms of intervention.

USA

Laws passes at the turn of the 20th century allowed states to sterilize people who they saw unfit: deemed mental handicapped.

Virginia continued to sterilize until the 1970s and USA sterilized more than 65000 people for feeble-mindedness.

Where are we?

Opinion polls show that many people believe that divine intervention actively guided the evolution of human beings.

National Academy of Science
Creationism and the Evidence for Evolution

Some creationists cite what they say is an incomplete fossil record as evidence for the failure of evolutionary theory.

The fossil record was incomplete in Darwin's time, but many of the important gaps that existed then have been filled by subsequent paleontological research.

National Academy of Science
Creationism and the Evidence for Evolution

The most reasonable scientific conclusion that can be drawn from the fossil record is that descent with modification has taken place as stated in evolutionary theory.

Special creationists argue that "no one has seen evolution occur."

Due to molecular biology this is no longer true!!

Furthermore, on a minor scale, we "experience" evolution occurring every day.

The annual changes in influenza viruses and the emergence of antibiotic-resistant bacteria are both products of evolutionary forces.

On a larger scale, the evolution of mosquitoes resistant to insecticides is another example of the tenacity and adaptability of organisms under environmental stress.

Similarly, malaria parasites have become resistant to the drugs that were used extensively to combat them for many years.

As a consequence, malaria is on the increase, with more than 300 million clinical cases of malaria occurring every year.

The evolution of complex molecular systems can occur in several ways.

Natural selection can bring together parts of a system for one function at one time and then, at a later time, recombine those parts with other systems of components to produce a system that has a different function.

We see this with several of the bones of the reptilian jaw. The function is now the ear of mammals.

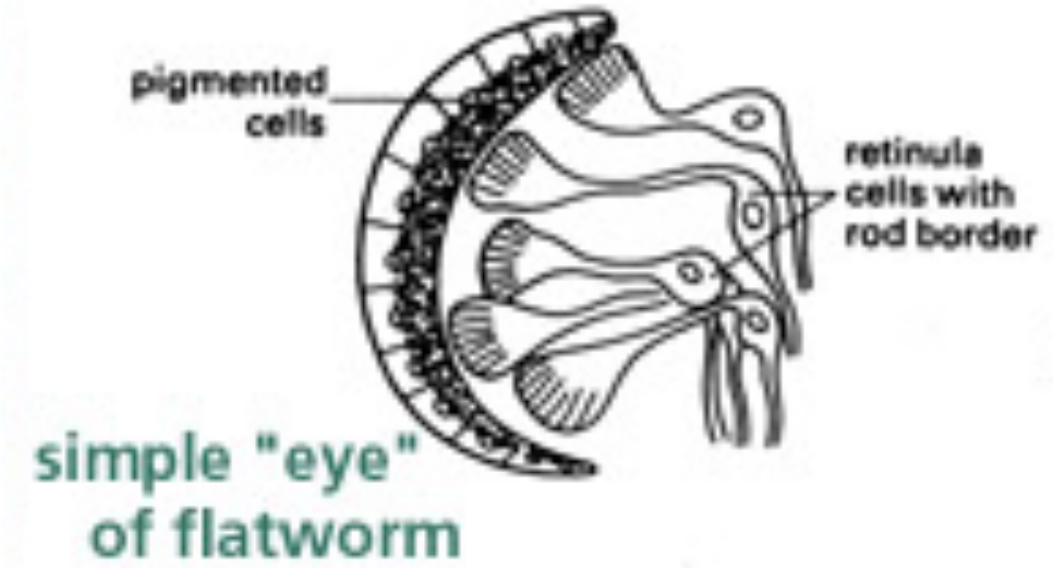
The evolution of complex molecular systems can occur in several ways.

Genes can be duplicated, altered, and then amplified through natural selection. The complex biochemical cascade resulting in blood clotting has been explained in this fashion.

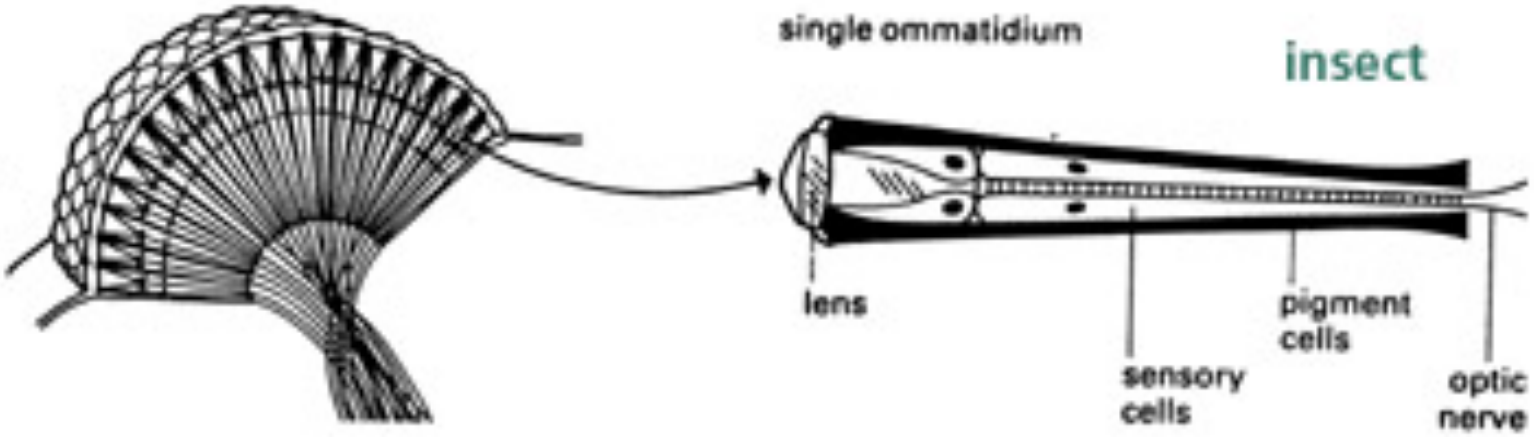
Similarly, evolutionary mechanisms are capable of explaining the origin of highly complex anatomical structures.

For example, eyes have evolved independently many times during the history of life on Earth.

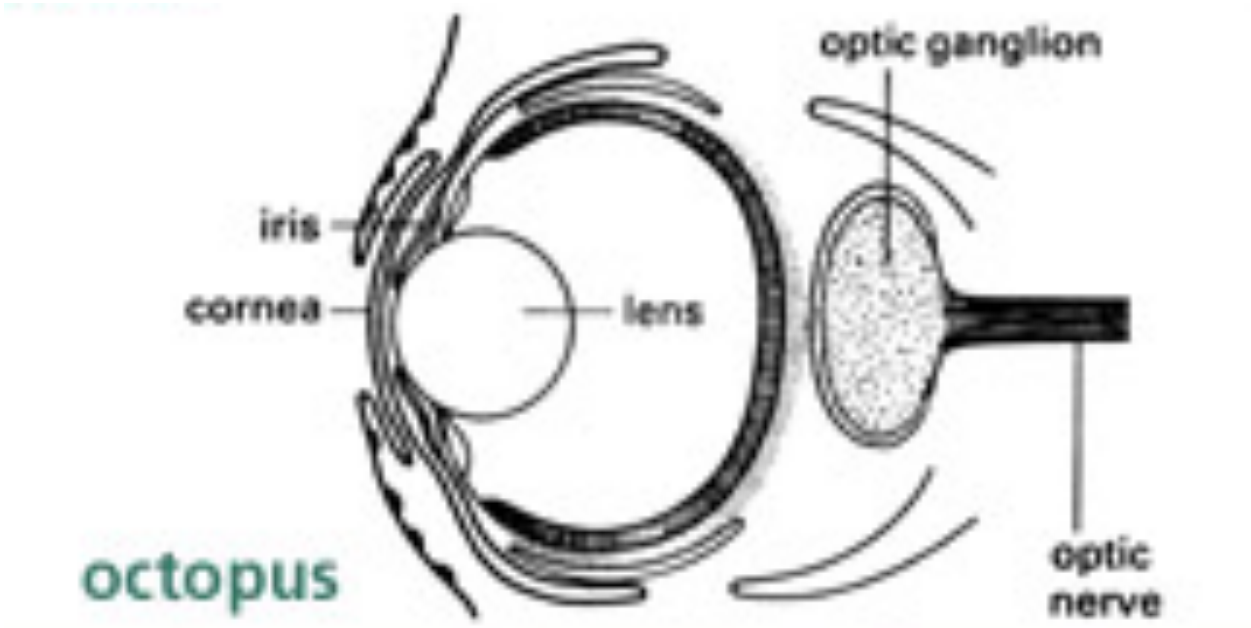
The steps proceed from a simple eye spot made up of light-sensitive retinula cells (as is now found in the flatworm),



to formation of individual photosensitive units (ommatidia) in insects with light focusing lenses,

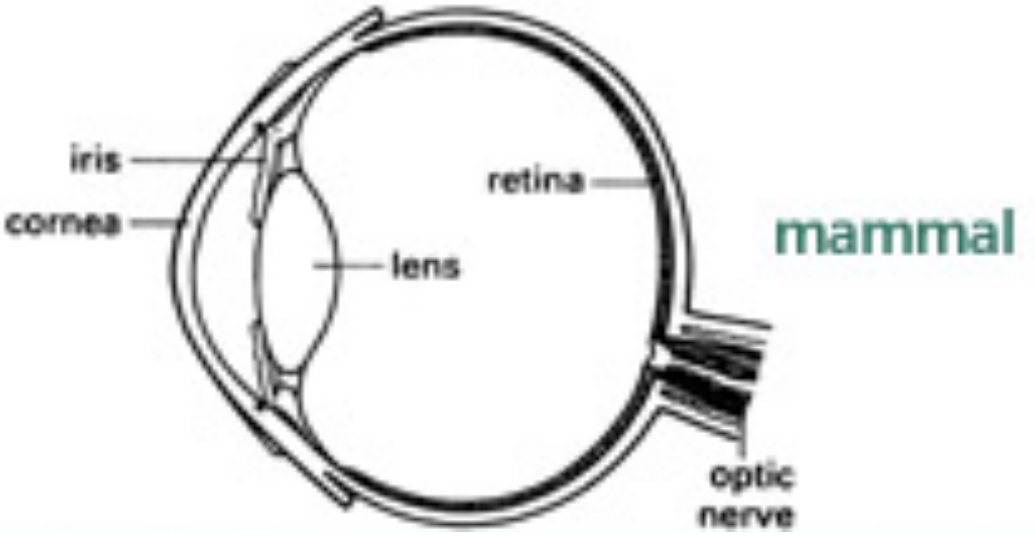


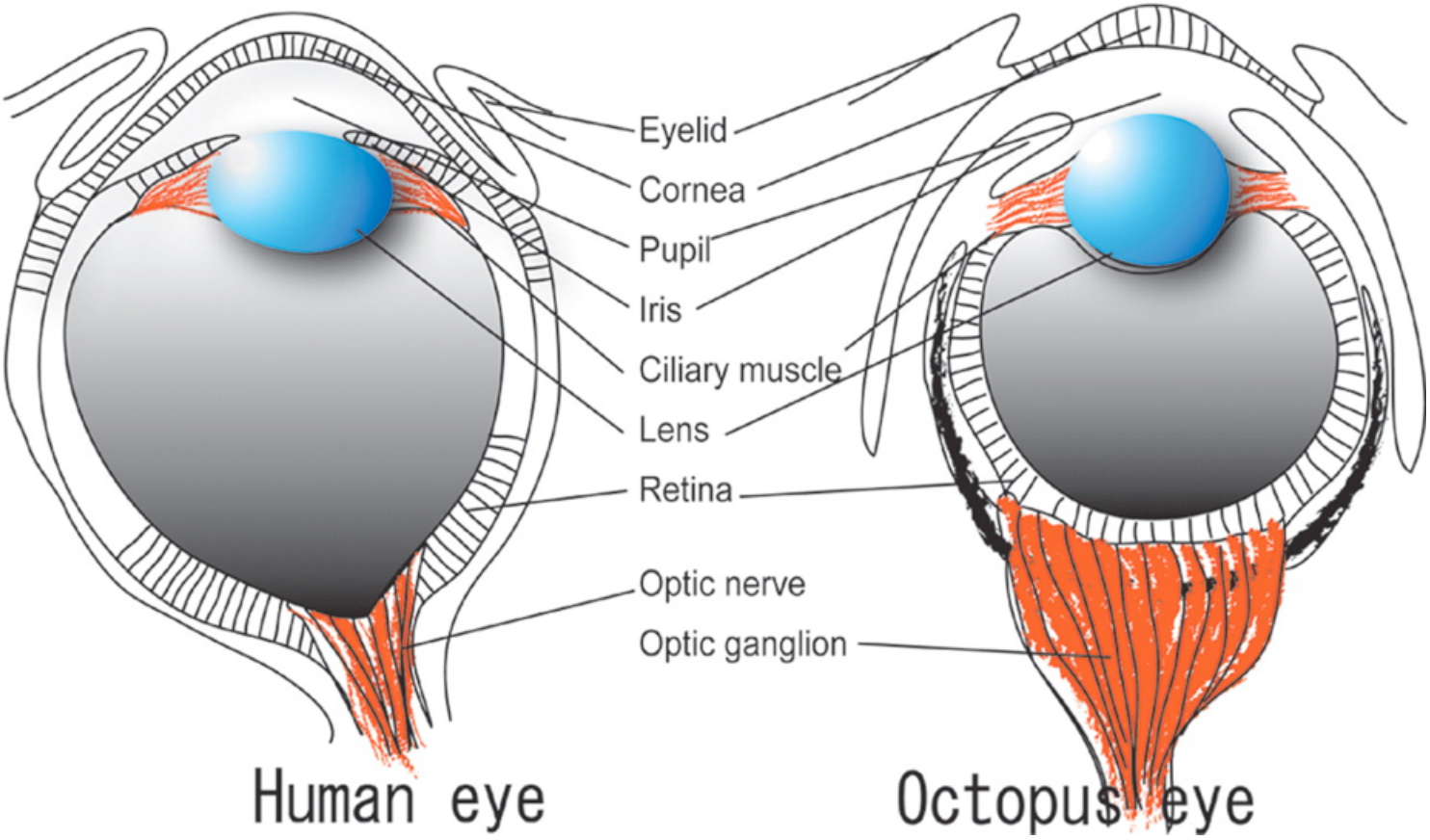
to the eventual formation of an eye with a single lens focusing images onto a retina.



In humans and other vertebrates, the retina consists not only of photoreceptor cells but also of several types of neurons that begin to analyze the visual image.

Through such gradual steps, very different kinds of eyes have evolved, from simple light-sensing organs to highly complex systems for vision.




Eyelid
Cornea
Pupil
Iris
Ciliary muscle
Lens
Retina
Optic nerve
Optic ganglion
Human eye
Octopus eye

Credit: Michael Nicholson/CORBIS

Darwin's eye

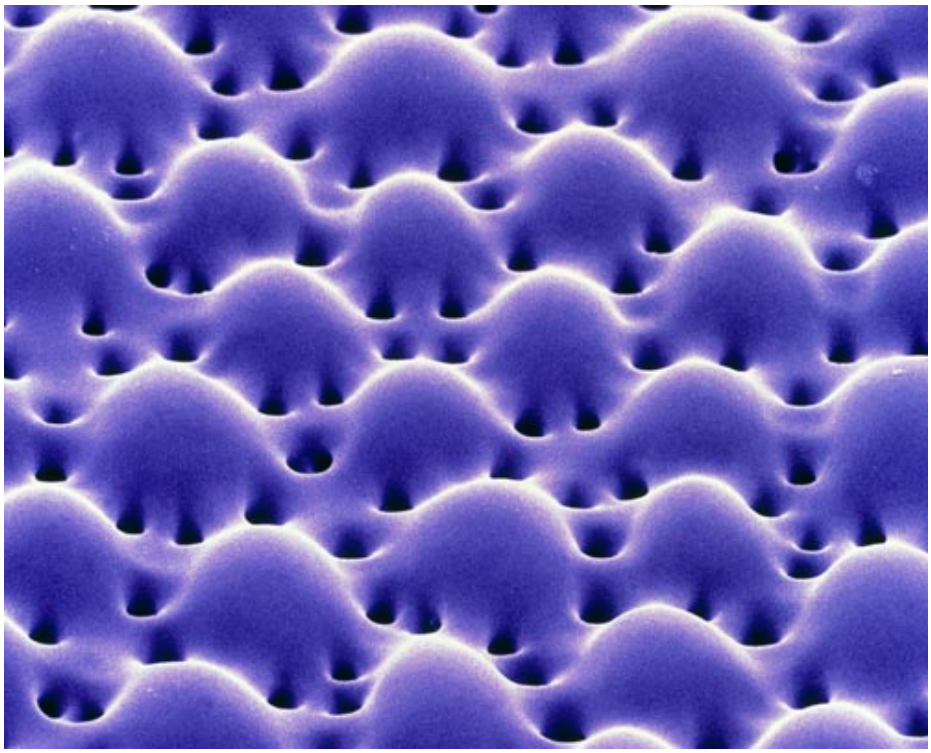
http://www.nature.com/news/specials/darwin/gallery/index.html

the eye

"To suppose that the eye, with all its inimitable contrivances for adjusting the focus to different distances, for admitting different amounts of light, and for the correction of spherical and chromatic aberration, could have been formed by natural selection, seems, I freely confess, absurd in the highest possible degree...

"Yet reason tells me, that if numerous gradations from a perfect and complex eye to one very imperfect and simple, each grade being useful to its possessor, can be shown to exist; if further, the eye does vary ever so slightly, and the variations be inherited, which is certainly the case; and if any variation or modification in the organ be ever useful to an animal under changing conditions of life, then the difficulty of believing that a perfect and complex eye could be formed by natural selection, though insuperable by our imagination, can hardly be considered real."

— Charles Darwin, *On the Origin of Species*



Brittlestar

Credit: LUCENT TECHNOLOGIES' BELL LABS/SCIENCE PHOTO LIBRARY

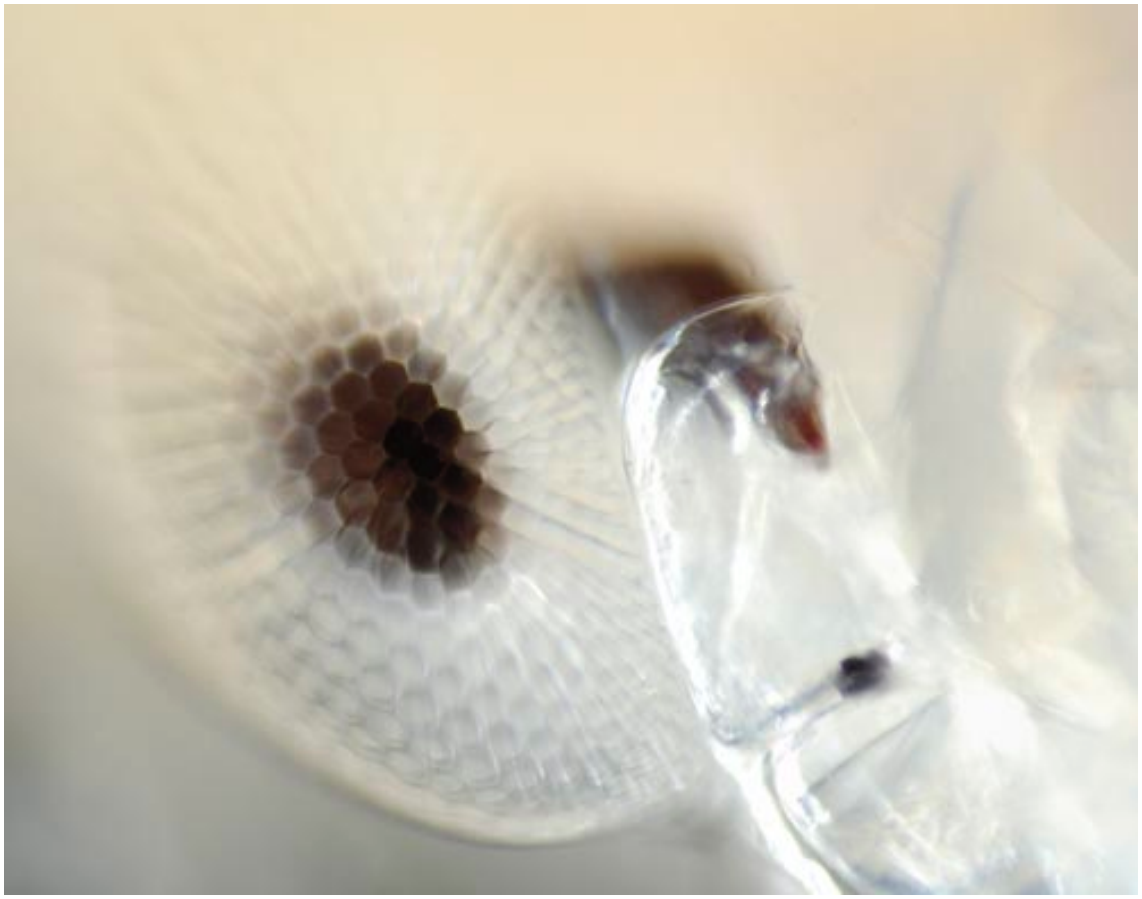
Text: Simon Ings

Eyes are largely built from building blocks designed for other things. The lenses of vertebrates use proteins that bacteria developed to deal with stress; the flexible guanine mirrors that make a cat's eye glow in the dark provide gas-proofing for the swim bladders of fish. And the components are put together in a bewildering number of ways. The brittlestar (above) has an entire carapace pitted with optically tuned calcite crystals.

Credit: Nature Production/naturepl.com
Text: Simon Ings

Scallop

The scallop eye uses a curved mirror to focus incoming light.



Credit: Solvin Zankl/naturepl.com
Text: Simon Ings

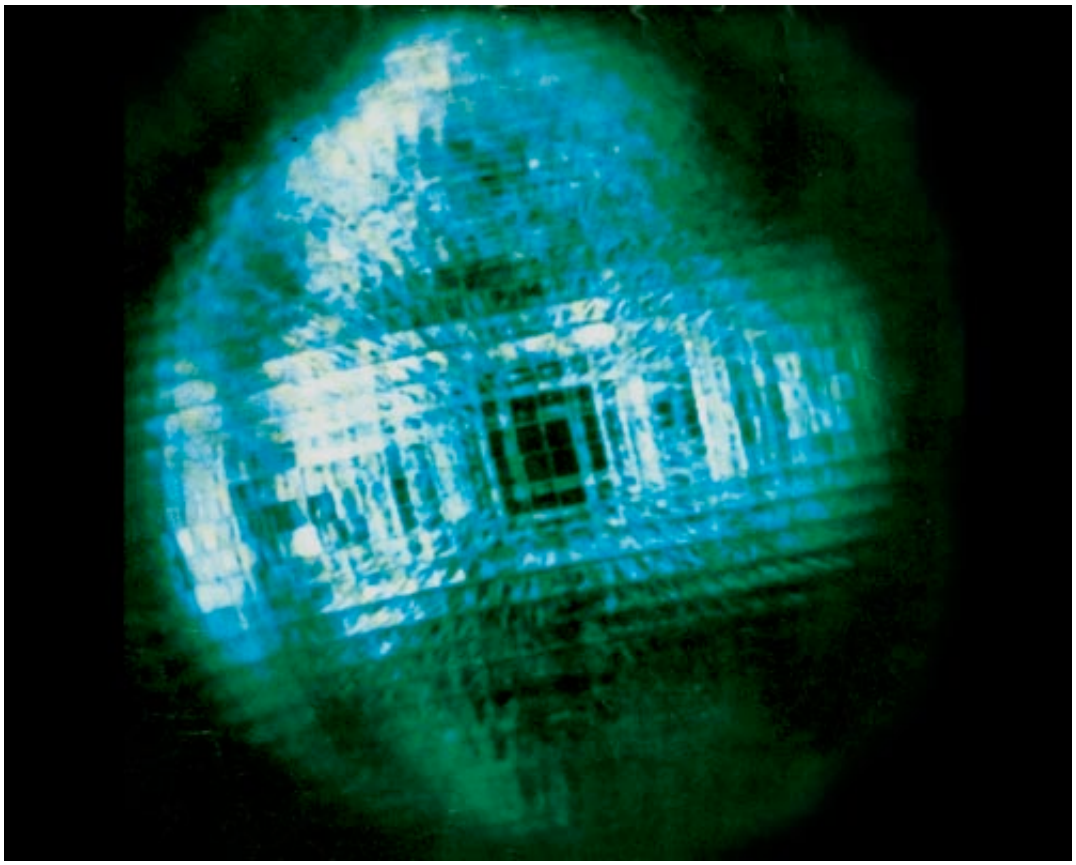
Pram bug

The pram bug *Phronima* elongates each element of its eyes with a natural optical fibre.

Credit: Kim Taylor/naturepl.com
Text: Simon Ings

Dragonfly

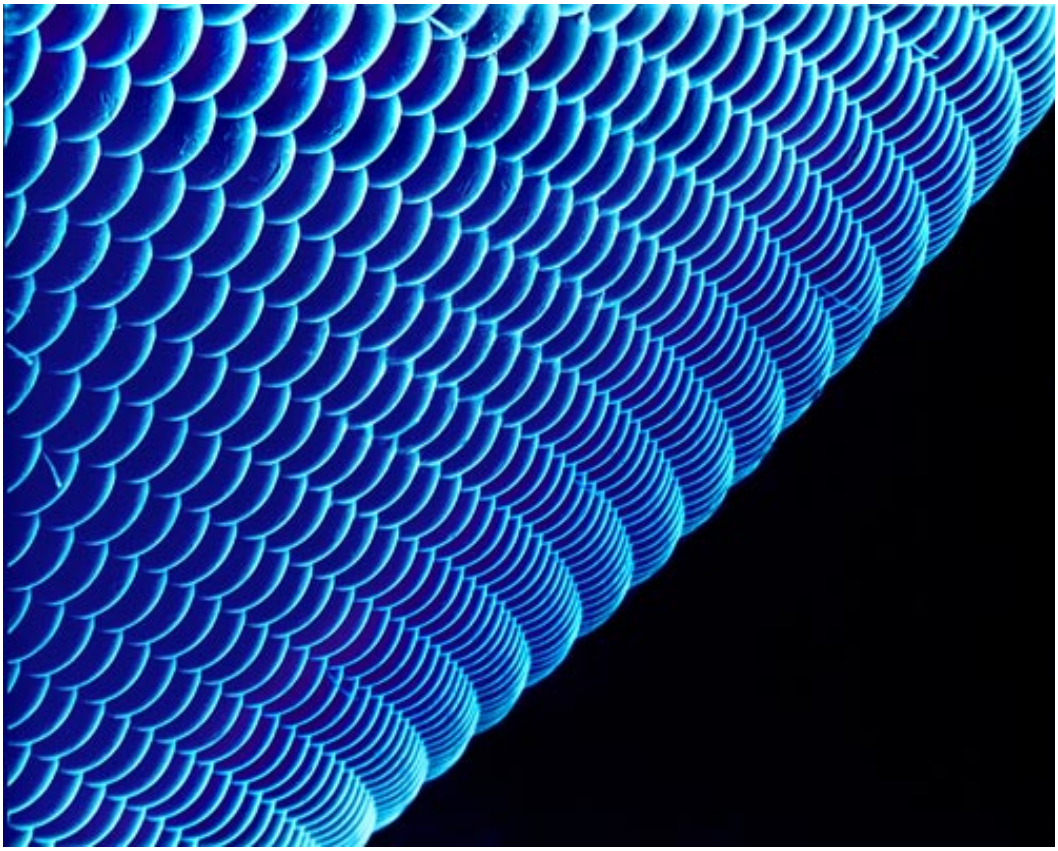
The dragonfly's compound eyes — each an array of up to 28,500 individual visual organs — may look ungainly, but they are extremely resistant to motion blur as it hunts on the wing.



Shrimp

Credit: Michael Land, Text: Simon Ings

In dim conditions, an eye must gather what light it can, regardless of image clarity. By using box mirrors to focus light on a common point, the eyes of shrimp and lobsters enjoy more than 250 times the light-catching power of the human eye.



Hoverfly

Credit: SUSUMU NISHINAGA/SCIENCE PHOTO LIBRARY, Text: Simon Ings

The compound eye is a dead end in design terms; no matter how big you make it, it produces poor images. But it is well adapted to the zigzagging life of a hoverfly. The abrupt changes in the fly's direction of flight, which occur several times a second, help the eyes produce a fuller picture of the world.

Cuttlefish *Credit: Alan James/naturepl.com, Text: Simon Ings*

Across the animal kingdom, eyes have evolved in different ways, to different purposes, in exuberant diversity. Yet they are all sculpted by the lawfulness of light — and the imperatives of survival. This panoply of eyes sees the world in different ways, some concerned with colour, others with movement, others with acuity. Yet time and again, unrelated eyes hit upon common solutions to the problem of how to safely gather and focus information from a sunlit world. The eyes of the cuttlefish (above) grow from invaginations of the skin; those of the human grow in part out of the front of the brain; each uses completely different receptors to pick up the light they focus. Yet cuttlefish and people see the world in the same way, through eyes whose similarities outweigh their deep differences.

Spider

Credit: MARK MOFFETT/Minden Pictures/FLPA, Text: Simon Ings

The principal high-resolution eyes of true spiders are as big and as powerful as the eyes of small rodents. Subsidiary eyes are used to spot movement in the periphery, and sometimes, by harnessing the polarizatio of sunlight, to navigate.

Mantis shrimp

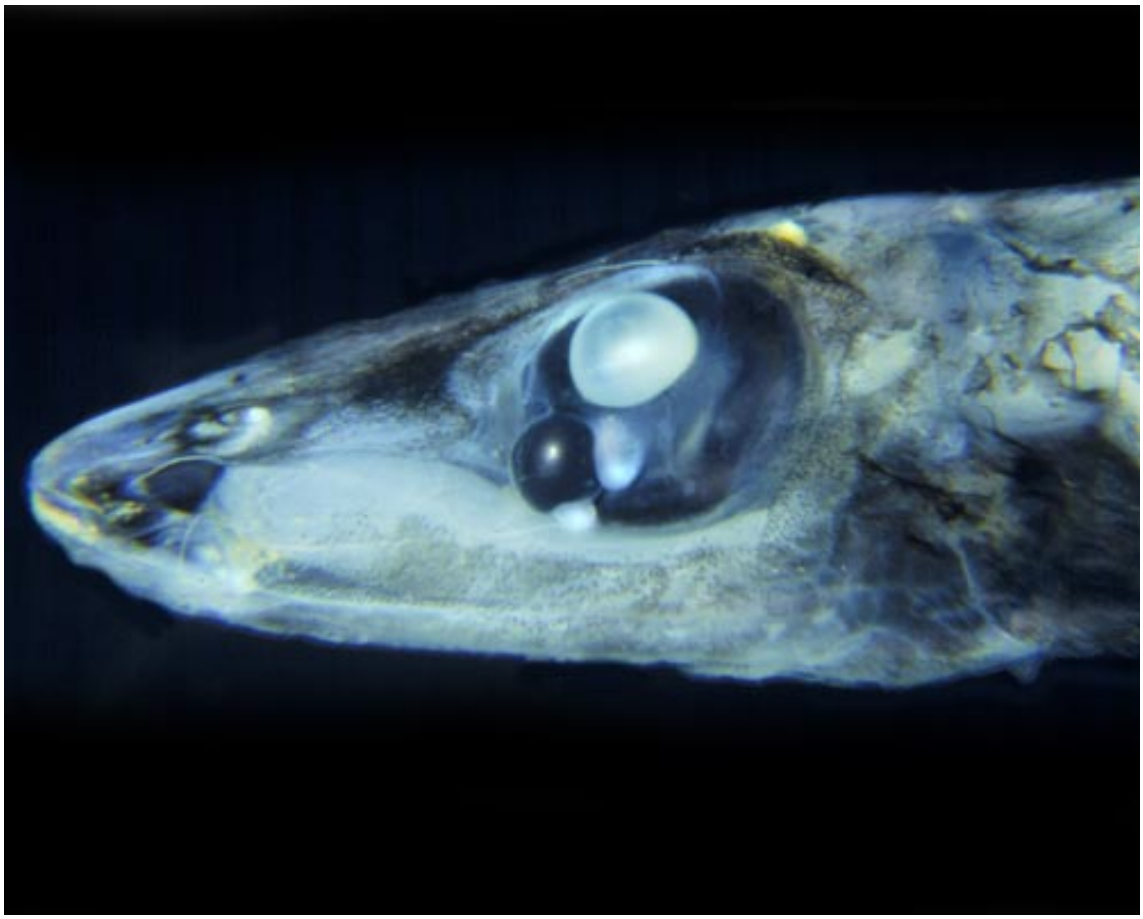
Credit: Roy Caldwell, Text: Simon Ings

Human eyes are rare in their concern for producing images; most of the eyes in the animal kingdom are tuned to movement and colour. The band running across the eye of the mantis shrimp contains receptors tuned to 16 different wavelengths (humans typically have three), giving colour vision of extraordinary subtlety and complexity.

Anableps

Credit: Paul Zahl/National Geographic/Getty Images, Text: Simon Ings

Two eyes are not a universal norm. The fish *Anableps anableps* effectively has four eyes in two sockets; each eye has one half for seeing above water and one half for seeing below.



Bathylynchops

Credit: Hans-Joachim Wagner, Text: Simon Ings

Another fish, *Bathylychnops exilis*, has two pairs of eyes, one set to look up, which is how it sees its prey, and one to look down — but for what, nobody knows.

Moth

Credit: Alamy, Text: Simon Ings

The better your predators can see, the more need there is for disguise. For some animals, looking inedible is not enough: the unnervingly detailed mock eye on a moth wing is meant to convince predators that something big is looking right back at them.

How many time X has evolved independently

The venomous sting – 10 times

Sound production for social purposes has evolved independently in birds, mammals, crickets and grasshoppers, cicadas, fish and frogs.

Electrolocation - several times

How many time X has evolved independently

True flapping flight – 4 times in insects, pterosaurs, bats, and birds.

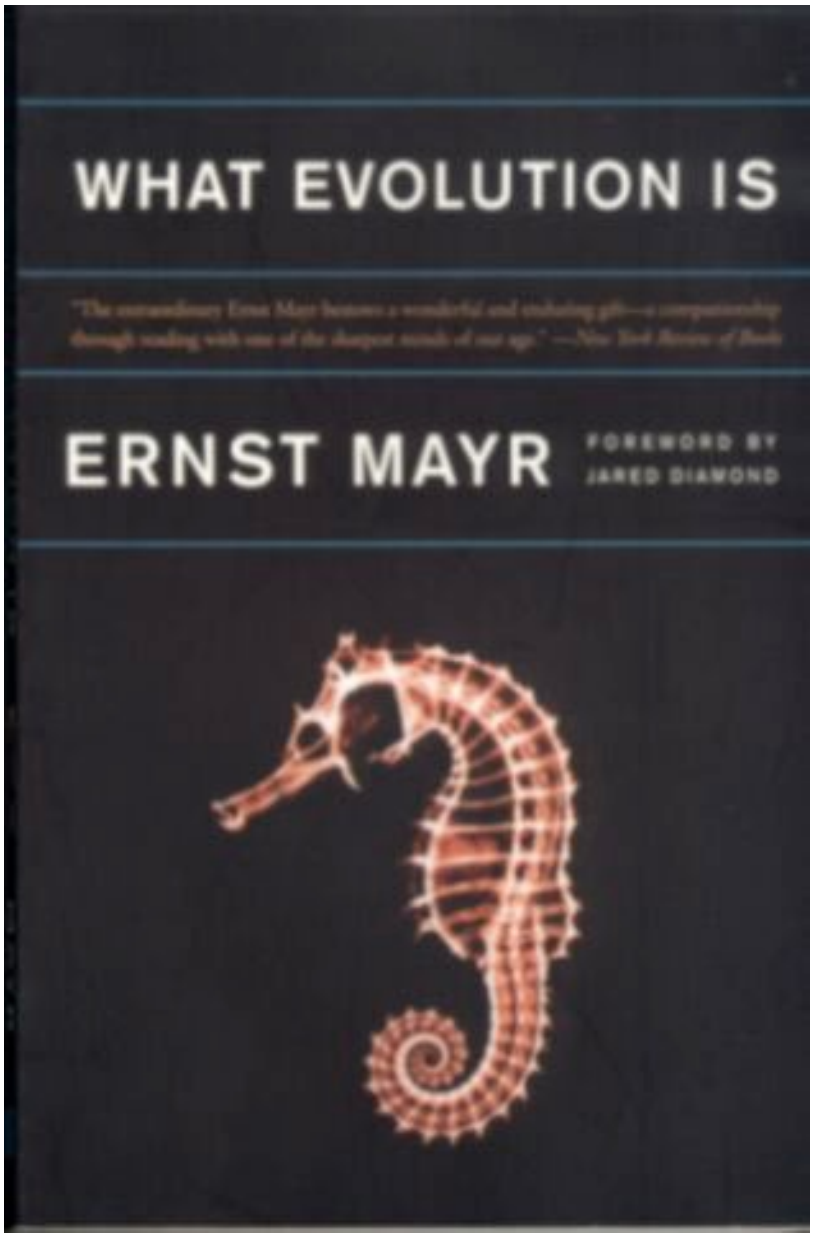
Parachuting and gliding have evolved many times (perhaps hundreds)

Jet propulsion – twice. Cephalopod mollusks and scallops.

The eye

It has been estimated that the eye has evolved independently more than 40 times in various parts of the animal kingdom.

Here we are talking about image forming optics, not light sensing cells.


WHAT EVOLUTION IS
ERNST MAYR
FOREWORD BY
JARED DIAMOND

EVER SINCE DARWIN

REFLECTIONS IN NATURAL HISTORY

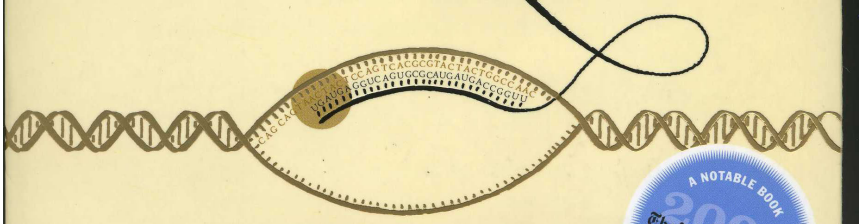
STEPHEN JAY GOULD

AUTHOR OF BULLY FOR BRONTOSAURUS

THE *NEW YORK TIMES* BESTSELLER

"[A] magnum opus." — PHILADELPHIA INQUIRER

RICHARD DAWKINS



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2004
The New York Times Book Review
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A Pilgrimage to the Dawn of Evolution

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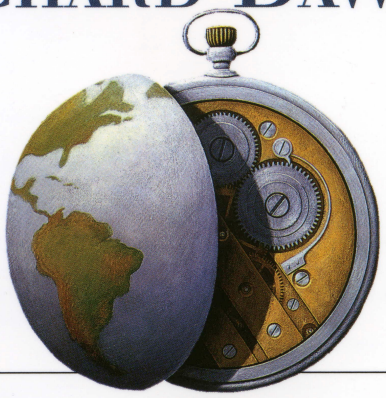

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WITH A NEW INTRODUCTION

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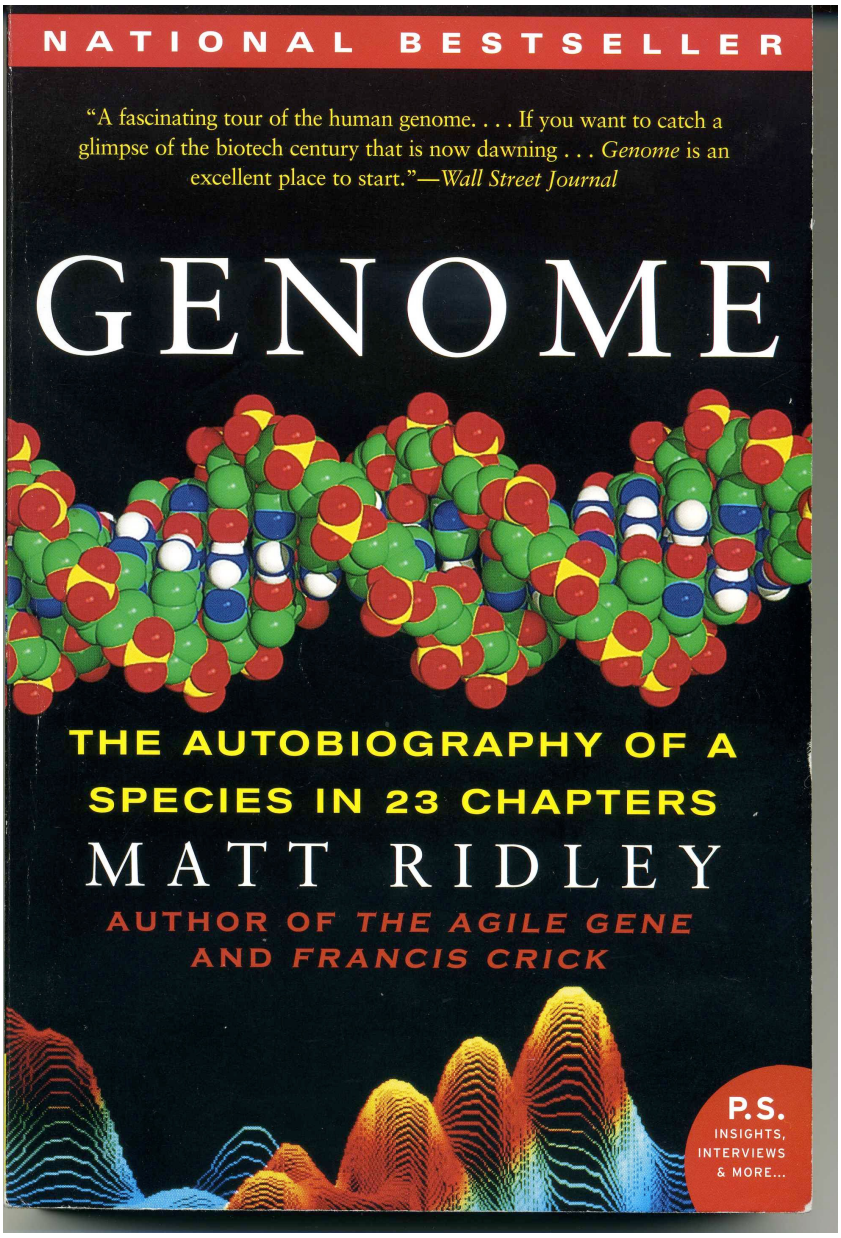
BY THE AUTHOR OF THE SELFISH GENE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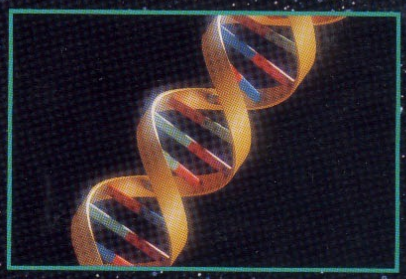

J. P. Moreland, editor

FOREWORD BY

PHILLIP E. JOHNSON

THE CREATION HYPOTHESIS