

Population Geography Course, by W. W. Munroe (2010)

Chapter 5 - Early Human Migrations

Main points: Early Humans, ice ages, migration, fossil record, isolated groups, DNA, Population genetics

Main Sources: Genographic Project, wikipedia.

Genographic Project: A Landmark Study of the Human Journey

Where do you really come from? And how did you get to where you live today? DNA studies suggest that all humans today descend from a group of African ancestors who—about 60,000 years ago—began a remarkable journey.

The Genographic Project is seeking to chart new knowledge about the migratory history of the human species by using sophisticated laboratory and computer analysis of DNA contributed by hundreds of thousands of people from around the world. In this unprecedented and of real-time research effort, the Genographic Project is closing the gaps of what science knows today about humankind's ancient migration stories.

The Genographic Project is a five-year research partnership led by National Geographic Explorer-in-Residence Dr. Spencer Wells. Dr. Wells and a team of renowned international scientists and IBM researchers, are using cutting-edge genetic and computational technologies to analyze historical patterns in DNA from participants around the world to better understand our human genetic roots. The three components of the project are: to gather field research data in collaboration with indigenous and traditional peoples around the world; to invite the general public to join the project by purchasing a Genographic Project Public Participation Kit; and to use proceeds from Genographic Public Participation Kit sales to further field research and the Genographic Legacy Fund which in turn supports indigenous conservation and revitalization projects. The Project is anonymous, non-medical, non-profit and all results will be placed in the public domain following scientific peer publication.

<https://genographic.nationalgeographic.com/genographic/index.html>

Atlas of Human Migration: First Humans? When?

Homo erectus

Homo erectus (from the Latin *erigere*, "to put up, set upright") is an extinct species of hominid that originated in Africa—and spread as far as China and Java—from the end of the Pliocene epoch to the later Pleistocene, about 1.8 to 1.3 million years ago.[1] There is still disagreement on the subject of the classification, ancestry, and progeny of H. erectus, with two major alternative hypotheses: erectus may be another name for Homo ergaster, and therefore the

direct ancestor of later hominids such as *Homo heidelbergensis*, *Homo neanderthalensis*, and *Homo sapiens*; or it may be an Asian species distinct from African *ergaster*. [2][3][4]

H. erectus originally migrated from Africa during the Early Pleistocene, possibly as a result of the operation of the Saharan pump, around 2.0 million years ago, and dispersed throughout much of the Old World. Fossilized remains 1.8 and 1.0 million years old have been found in Africa (e.g., Lake Turkana[5] and Olduvai Gorge), Europe (Georgia, Spain), Indonesia (e.g., Sangiran and Trinil), Vietnam, and China (e.g., Shaanxi).

http://en.wikipedia.org/wiki/Homo_erectus

Reproduction creating first human

Could parents have created more first humans?

Could other *homo erectus* have created more first humans?

15 years later first offspring of first human

Could reproduce with many often

Reproducing for 15 years before his offspring start reproducing

15 years later offspring of offspring reproduce creating more humans

Some offspring may not be human, maybe *homoerectus* with recessive genes

What proportion of offspring will be human?

Omo 1 and 2

Ethiopia

omo river valley

R. Leakey

195,000 ya

South Africa

Klasis River Cave

60,000 to 130,000 ya

Maritime diet – shell fish, penguin bones

Tools of materials not local

Trade?

Middle stone age

200,000 to 60,000 years ago

Eurasian man 79,000 to 31,000 ya

Rapid pop growth

Good weather made it possible to move north

Moved out of africa

Tool refinement

Art

Sumatra

Mt toba volcano

Large over last 2 million years

Three thousand times Mt St Helens

Circa 73,000 bc
-59 F
Volcanic winter
Temp drop
Drought
Wiped out humans Pop drop
Leaving small group
Prone to Rapid genetic divergence
Diversification
Disruptions of natural selection
Genetic drift
Small group human descent began to diverge rapidly
After math of Mt toba destruction led to genetic diversification
Began broad path of genetic divergence
Started

Adam

Tree of human genetic diversity
Descendants are the only ones to live to today
60,000 years ago
Saun men - Bush men
Direct living link to modern humans
Complex language
141 distinct sounds
Most languages use only 20 to 40 sounds
Gentic lineages become more complex with age

Australia 40,000 to 60,000 ya

Water trapped in ice lower sea levels
Glacial Plistocene
Land mass bridge to Australia
Receding ice raised water levels isolating people
Neandrethal
Could they talk?
Kebara Caves Isreal
Throat bone fossil
Range of speech
Language complexity important to survival
Australia
55,000 ya
Early art

Great leap forward

Tool refinement
55 to 60,000 ya
Language improvement
Genetic refinement

Neandertal

- Intelligent hominids
- 30 to 100,000 ya
- Not human ancestors
- Humans and neandertals
- Branched off about 500,000 ya
- Alternated occupation of caves in mid east
- Contemporaries
- Had tools and cooperative hunting
- Ice age favoured by humans
- Humans could adjust
- Out competed for fewer resources
- Better cognitive abilities

Australia

- 20,000 to 45,000 ya
- Large lake
- Food, tools, human remains
- Possibly 58,000 ya oldest remains outside of Africa

Africa

- Sahara driest 20 to 40,000 ya
- Therefore people who migrated to the mid east could not reenter africa
- They followed herds north to the 45 to 50 parallel then east to the pacific ocean
- Steepe highway
- Dispersed

Populated eurasia

- Into north developed specialized cold climate skills allowing them to populate Northeastern Siberia and North America.

The Aurignacian Period

- 35,000 ya
- Flint blades
- Specialized engraving tools – burin
- Cave paintings in Europe 32,000 ya
- Beringia – land bridge 620 miles wide
- 15,000 to 20,000 ya people migrated into North America when ice formation lowered sea level 300 ft lower than today
- Animals followed opening in the ice on the leeward side of the mountains melted by warm winds
- Microblade techniques

Europe – Gravettian cultures flourished

- Upper Paleolithic peoples
- Mammoth for food and skins and shelter hides and bones
- Drive herds into traps or off embankments
- Mammal extinctions
- Many species gone
- Large mammals
- Human hunting

Or temperature fluctuations - ice ages
Shifting landscapes vegetation food chains with cold and drought correspond with many megafaunal extinctions

North America 10 to 25,000 ya

Late Wisconsin Glaciation

Laurentide Ice Sheet encompassed over 5 Million square miles 13 million sq km

Covering most of Canada and Northern USA

Restricted migrations

No settlement on Ice sheets

Coastal migration

Rocky mountain pathway?

18,000 ya blades human habitation older than figured

12,000 to 10,000 ya

Jerico

Domestication of plants

Trade for obsidian

Japan

Jomon people

Pottery 12,000 ya

Magdalenian period – Europe 10 to 18,000 ya

Growing population of semi settled hunters and fishers

Neolithic revolution

10,000 ya all humans – hunter gatherers

Agrarian 5 to 10,000 ya

Transition around the world - independent

Domesticated wild goats and sheep

Basis of modern urban culture

Sedentary communities – no longer nomadic

Mexico – 10750 to 8670 ya

Large variety of foods

Versus relatively small number of species for hunter gatherers

How humans conquered the Earth CD Bonus Material

Population Geography

Time machine – Science

Information from blood

And saliva

Holds the story of our journey of our species

Each of us has a unique chapter

In our genes

1950

Use blood samples to build a family tree

Isolated tribes – clearer view of distant past

Distant family lines from blood type
Key in blood of isolated populations
To look into the past
Blood is the time machine
To rewrite history
10,000 people to 6 billion
Small band left Africa
We are their children
How did they populate the earth
Speed strength and resilience to conquer the world
Retrace the journey of early humans
Walk in their footsteps
Conditions, hardships
Journey of Man
Namibia South West Africa
All people come from here
Kalahari
San Bushman (who are these people? – the following is from wikipedia)

The indigenous people of southern Africa, whose territory spans most areas of South Africa, Zimbabwe, Lesotho, Mozambique, Swaziland, Botswana, Namibia, and Angola, are variously referred to as Bushmen, San, Sho, Basarwa, Kung, or Khwe. These people were traditionally hunter-gatherers, part of the Khoisan group and are related to the traditionally pastoral Khoikhoi. Starting in the 1950s, through the 1990s, they switched to farming as a result of government-mandated modernization programs as well as the increased risks of a hunting and gathering lifestyle in the face of technological development.

The Bushmen have provided a wealth of information for the fields of anthropology and genetics, even as their lifestyles change. One broad study of African genetic diversity completed in 2009 found the San people were among the five populations with the highest measured levels of genetic diversity among the 121 distinct African populations sampled.[1][2] The San people can be considered the most basal branch of the phylogenetic tree comprising all living humans; its divergence node with other humans is the deepest ancestral state that can ever be reconstructed using DNA from living humans.[clarification needed][improper synthesis?][dubious – discuss]

Naming

The terms "San", "Khwe", "Sho", "Bushmen", and "Basarwa" have all been used to refer to hunter-gatherer peoples of southern Africa. Each of these terms has a problematic history, as they have been used by outsiders to refer to them, often with pejorative connotations. The individual groups

identify by names[1] such as Ju/'hoansi and !Kung (the punctuation characters representing different click consonants), and most call themselves by the pejorative Bushmen when referring to themselves collectively.[3]

The different San language groups of Namibia met in late 1996 and agreed to allow the general term "San" to designate them externally.[4] This term was historically applied by their ethnic relatives and historic rivals, the Khoikhoi. This term means "outsider" in the Nama language and was derogatory because it distinguished the Bushmen from what the Khoikhoi called themselves, namely the "First People".[3] Western anthropologists adopted "San" extensively in the 1970s, where it remains preferred in academic circles. The term Bushmen is widely used, but opinions vary on whether it is appropriate because it is sometimes viewed as pejorative.[5][6]

In South Africa, the term "San" has become favored in official contexts, and is included in the blazon of the new national coat-of-arms; "Bushman" is considered derogatory by some groups. Angola does not have an official term for the San, but they are sometimes referred to as Bushmen, "Kwankhala", or "Bosquímanos" (the Portuguese term for "Bushmen"). In Lesotho they're referred to as "Baroa", which is where the Sesotho name for "South", "Boroa", comes from. Neither Zambia nor Zimbabwe have official terms, although in the latter case the terms "Amasili" and "Batwa" are sometimes used.[7][dead link] In Botswana, the officially used term is "Basarwa",[8] where it is partially acceptable to some Bushmen groups, although Basarwa, a Tswana language label, also has negative connotations. The term is a class 2 noun (as indicated by the "ba-" class marker), while an older class 6 variant, "Masarwa," is now almost universally considered offensive.[7]

Ancestral land conflict with Botswana government

Since the mid-1990s the central government of Botswana has implemented a relocation policy, aiming to move the Bushmen out of their ancestral land on the Central Kalahari Game Reserve into newly created settlements. Although the government has categorically denied that relocation has been forced[9], a recent court ruling confirmed that the removal was unconstitutional and residents were forcibly removed.[10]

The government's official reasons for adopting the policy is: "'Over time it has become clear that many residents of the CKGR already were or wished to become settled agriculturists, raising crops and tending livestock as opposed to hunting-gathering when the reserve was established in 1961."

"In fact, hunting-gathering had become obsolete to sustain their living conditions. These agricultural land uses are not compatible with preserving wildlife resources and not sustainable to be practiced in the Game Reserve."

"This is the fundamental reason for government to relocate the CKGR residents.""[9]

Opponents to the relocation policy claim that the government's intent is to clear the area – an area the size of Denmark – for the lucrative tourist trade and for diamond mining. This is strenuously denied on the government's official web site, stating that although exploration had taken place, it concluded that mining activity would not be viable and that the issue was not related to the relocation policy.

It is further claimed that the group as a whole has little voice in the national political process and is not one of the tribal groups recognized in the constitution of Botswana. Over the generations, the Bushmen of Southern Africa have continued to be absorbed into the African population, particularly the Griqua sub-group, which is an Afrikaans-speaking people of predominantly Khoisan that has certain unique cultural markers that set them apart from the rest of the Africans.

Court decision

On December 13, 2006, the Bushmen won a historic ruling in their long-running court case against the government.[11] By a 2-1 majority, the court ruled the refusal to allow the Basarwa into the Central Kalahari Game Reserve (CKGR) without a permit, and the refusal to issue special game licenses to allow the Bushmen to hunt was "unlawful and unconstitutional". It also found that the Bushmen were "forcibly and wrongly deprived of their possessions" by the government. However, the court did not compel the government to provide services such as water to any Bushmen who returned to the reserve. As of 2006, more than 1,000 Bushmen intended to return to the Central Kalahari Game Reserve, one of Africa's largest protected nature reserves.[10] However, only limited numbers of Bushmen have been allowed to return to this land. In April 2008, the United Nations Human Rights Council (UNHRC) criticised Botswana's government for not allowing certain Bushmen to return.[12] (<http://en.wikipedia.org/wiki/Bushmen>)

DNA: Manual of life

In every cell
Ladder of just
Four links molecules
Orchestrated Life processes
A c g t
Strung together in pairs in a long and complex sequence
If laided out the DNA from one person would stretch 3000 times to the moon and
back
Chain in 46 bundles – chromosoms
So long there are glitches
Mutations
inherited they are called markers
down the generations they may stay

San branches from the rest

Unlike others
Must be the oldest
Most unique
All different dna combinations except for one
Unique language
140 sounds
Well developed language
50K ya Click was an innovation
Same as weapons
Better hunters
Best trackers in the world
Why leave?
Curious
Pushed?
pulled

South african coast Cave

Home for humans
Then vanished
80,000 years ago
Jaw
Presence of a chin
Same look as today
Not as smart
Before Quantum Leap in Thinking
Tools
Blades chipped off from a stone
Attached to a stick
Very crude
Still too hard to make for most people
Not longer there 50,000 ya
What made them vanish?

60 and 30K ya animal and plant pops collapsed

So few, no archeology record

Ice Age

Polar Expanded southward

Locking world moisture as ice

Deserts grew and sea levels dropped

Caves left high and dry

Pasture to desert

prey scarce

food shortage

only those with the Quantum Leap in thinking could make it

left Africa

went to Australia

bushmen descendents walked to Australia

how?

Distant

10,000 km of open ocean

Isolated

100,000,000 ya separated from other continents with plate movement

No evidence of journey from Africa

Animals and plants different from rest of the world

Only primates are humans

Aborigines have African marker

Journey one way

How?

Lower sea levels allowed migration

But higher sea levels have covered up tracks

250 kilometers of sea to cross at the end.

India

Genetic markers in India how have markers from Africa, from themselves that are in Aborigines

Only men

Marker only on the Y chromosome

DNA packaged as bundles of Chromosomes

In pairs

Inherit one from each parent

Y, with markers passed down unchanged

Perfect genetic trail

Ancestral grandfather of the Aborigines

Acgt

C to t

In sequence

Position

2000 generations ago

Africa to Australia accounts for about 10% of the World's Population

Rest of the World

- India wave population grew rapidly
- Second wave went to China
- Distinctive appearance
- Became largest population on earth
- Two waves to China
- One north and one south of the mountains
- Visible in the blood
- Why not Europe?

Southern France

- Cromagnon people
- First cave men with an artistic side
- Ice age
- Mammoths
- Clothing and housing
- Humans getting taller and lighter in skin color
- Ice cut them off
- In isolation hair color noses and skin color changed
- New life skills
- Why 10,000 years
- Route to Europe...thought to be thru Turkey
- 50 minutes to 1 hour

40,000 ya Y – chromosome 1:00 to 1:07

Headed into ice age- Chutchi 1:07 – 1:22

Bering sea

Small group –

Arizona – Navajo 1:27 – 1:28

10 people

Rio 1:31

Models of migration to the New World (from

http://en.wikipedia.org/wiki/Models_of_migration_to_the_New_World)

There have been several models of migration to the New World (Human migration into the Americas) proposed by various academic communities. The question of how, when and why humans (Paleo-Indians) first entered the Americas is of intense interest to archaeologists and anthropologists, and has been a subject of heated debate for centuries. Current understanding of human migration into the Americas derives from advances in four integrated disciplines: archeology, physical anthropology, DNA analysis and linguistics.

While there is general agreement that America was first settled from Asia by people who migrated across Beringia, the pattern of migration, its timing, and the place of origin in Asia of the peoples who migrated to the Americas remains unclear.[2] In recent years researchers have sought to use familiar tools to validate

or reject established theories like Clovis first. As new discoveries come to light, past hypotheses are reevaluated and new theories constructed. The archeological evidence suggest that Paleo-Indians' first "widespread" habitation of the Americas occurred during the end of the last glacial period, or more specifically what is known as the late glacial maximum, around 16,500–13,000 years ago.[3]

Early Human settlements

- Valley dwelling
- Delta dwelling
- Domestication of flora and fauna

Population density

For humans, population density is the number of people per unit of area usually per square kilometer or mile (which may include or exclude cultivated or potentially productive area). Commonly this may be calculated for a county, city, country, another territory, or the entire world.

The world population is 6.8 billion [1], and Earth's total area (including land and water) is 510 million square kilometers (197 million square miles) [2] . Therefore the worldwide human population density is $6.8 \text{ billion} \div 510 \text{ million} = 13.3 \text{ per km}^2$ (34.5 per sq. mile). If only the Earth's land area of 150 million km² (58 million sq. miles) is taken into account, then human population density increases to 45.3 per km² (117.2 per sq. mile). This calculation includes all continental and island land area, including Antarctica. Considering that over half of the Earth's land mass consists of areas inhospitable to human inhabitation, such as deserts and high mountains, and that population tends to cluster around seaports and fresh water sources, this number by itself does not give any meaningful measurement of human population density.

http://en.wikipedia.org/wiki/Population_density

WORLD POPULATION IN 2300

Proceedings of the United Nations

Expert Meeting on World Population in 2300 United Nations Headquarters New York

9. According to the medium scenario, world population rises from 6.1 billion persons in 2000 to a maximum of 9.2 billion persons in 2075 and declines thereafter to reach 8.3 billion in 2175. After 2175, a return to replacement fertility coupled with increasing longevity produces a steadily increasing population that reaches 9 billion by 2300. Most of the projection population increase between 2000 and 2300 occurs in the less developed regions, whose population rises from 4.9 billion in 2000 to 7.7 billion in 2300. Although the population of more

developed regions also increases, the change is considerably less (from 1.2 billion in 2000 to 1.3 billion in 2300). All scenarios result in significant shifts in the geographical distribution of the world population. According to the medium scenario, the share of Africa would double, passing from 13 per cent of the world population in 2000 to 24 per cent in 2300. That of Asia would drop by about ten per cent (from 61 per cent in 2000 to 55 per cent in 2300), while that of Europe would drop by about half (from 12 per cent in 2000 to 7 per cent in 2300).