



The
Incredible History
of India's Geography

SANJEEV SANYAL



PUFFIN

SANJEEV SANYAL WITH SOWMYA
RAJENDRAN

The Incredible History of India's
Geography

Illustrations by Jit Chowdhury



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THE INCREDIBLE HISTORY OF INDIA'S GEOGRAPHY

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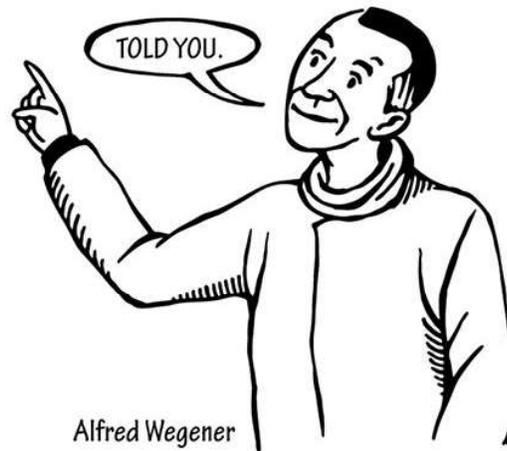
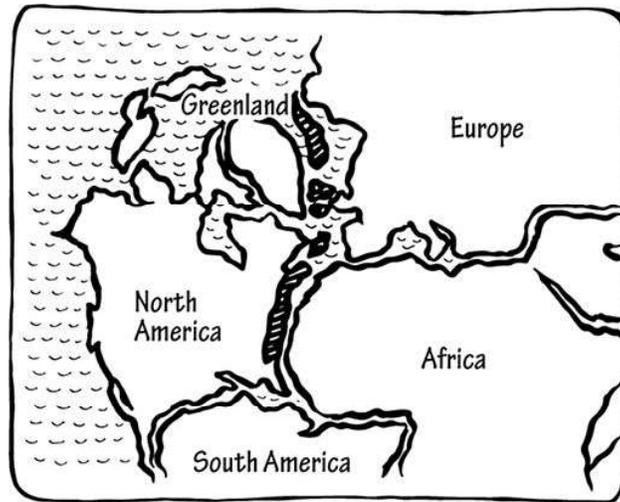
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Of Shakes and Quakes

If someone asked you to point out where India is on the world map, you'd probably do it in a jiffy. There it is, jutting into the Indian Ocean with Sri Lanka forming a teardrop beneath its land mass. The image is a very familiar one. But what if you were told that the Indian subcontinent was not always located where it is today? That it was once attached to Africa and Madagascar?

This is a fairly new discovery. For a long time, till the early twentieth century, people thought that continents were fixed land masses. But in 1912, a geologist called Alfred Wegener came up with the theory of continental drift.

Continental drift is the movement of the continents across the ocean bed. Now don't look down at your feet to see if you are moving—this drifting happens very, very slowly, over hundreds of millions of years!



Wegener expanded on this idea in his book *The Origin of Continents and Oceans*, which was published in 1915. He argued that the present continents all came from one single land mass that later drifted apart. While this sounded strange to people at that time, it explained why the world map looks like a jigsaw puzzle with different countries and continents appearing like they could fit into each other. These countries are far apart but their outlines seem like they could be joined together.

It took nearly fifty years for Wegener's arguments to be scientifically proved! In the late fifties and sixties, a great deal of new geological data established what Wegener had suspected: the earth's crust is a patchwork of plates and these plates are moving

relative to each other. This led to the modern theory of plate tectonics.

Here is how scientists believe it all happened . . .

A billion years ago, there was a supercontinent called Rodinia. It was probably located south of the equator but we are still not sure about its exact shape or size. This supercontinent broke up around 750 million years ago and the various pieces, i.e. continents began to drift apart. This period is loosely called the Pre-Cambrian period. There were only single-cell organisms like bacteria alive then.

Did you know?

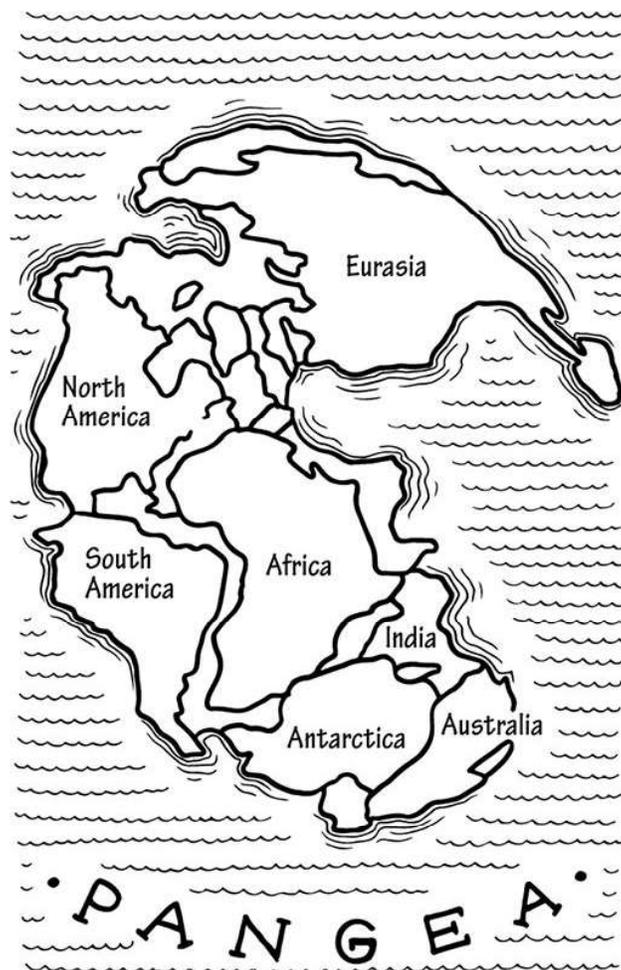
The Aravalli Range in India is thought to be the oldest surviving geological feature anywhere in the world! These mountains were once very tall, maybe as tall as the Himalayas, but over hundreds of millions of years, they have been eroded down to low hills and ridges. The northernmost point of the Aravallis is the North Ridge near Delhi University. Farther south, near the Gujarat-Rajasthan border, these short hills turn into mountains again. The Guru Shikhar peak at Mount Abu rises to 1722 metres above sea level and is considered to be a sacred place. The Rajput warrior clans claim that their ancestors arose from a great sacrificial fire on this mountain! Despite the significance of the Aravallis, they are under threat today because of reckless mining and quarrying.

Fossil records show that around 530 million years ago, there was a sudden appearance of a large number of complex organisms on the earth. This is called the Cambrian Explosion—but remember that we're talking in geological terms. This 'explosion' took millions of years to happen. Over the next 70–80 million years, a whole new array of life forms evolved. While all of this was happening, the continental land masses began to reassemble and, about 270 million years ago, fused into a new supercontinent called Pangea.

How did the new world look? As you can see, the Indian craton is wedged between Africa, Madagascar, Antarctica and Australia.

A craton is a large, stable block of earth which forms the centre of a continent.

It was on Pangea that the dinosaurs appeared 230 million years ago. But the earth was still restless and Pangea began to break up around 175 million years ago, during the Jurassic era. It first split into a northern continent called Laurasia (consisting of North America, Europe and Asia) and a southern continent called Gondwana (Africa, South America, Antarctica, Australia and India). You might have heard of the Gond tribe of central India—well, this is where the name comes from!



A large number of dinosaur remains have been found in Raioli village of Balasinor Taluka, Gujarat. The site was identified in 1981, and going by the thousands of fossilized eggs found there, it appears

to have been a popular hatchery for dinosaur mothers. The fossilized bones of a previously unknown dinosaur, 25–30 feet long and two-thirds the size of the Tyrannosaurus Rex, were also discovered. This dinosaur has been named *Rajasaurus Narmadsensis*—the Lizard King of the Narmada!

It is believed that, first, India, Antarctica and Madagascar separated from Africa around 158 million years ago and then, 130 million years ago, India and Madagascar separated from Antarctica. Around 90 million years ago, India separated from Madagascar and drifted steadily northwards, towards Asia. As this happened, the land mass passed over the Reunion ‘hotspot’, causing an outburst of volcanic activity. This hotspot is currently under the island of Reunion in the Indian Ocean and the eruptions it caused then, mostly in the Western Ghats near Mumbai, created the Deccan Traps.

When we say ‘eruptions’, it’s not the conical sort of eruption that you may associate with volcanoes. These eruptions are more like a layer-by-layer oozing that created the stepped, flat-topped outcrops that geologists call Traps. (In the late seventeenth century, Shivaji and his band of Maratha guerrillas used this unique terrain to wear down the armies of the Mughal emperor Aurangzeb. The Traps lived up to their name on that occasion!) In geological terms, this volcanic episode did not last very long—just 30,000 years. But it was a dramatic phenomenon and might well have led to the extinction of the dinosaurs.

As India continued its northward journey, it collided with the Eurasian plate 55–60 million years ago. This collision pushed up the Himalayas and the Tibetan Plateau. And the process is still not over! The Himalayas are rising even now by around 5 mm every year, although erosion reduces the actual increase in height. This region is considered to be seismically unstable, meaning that it is prone to frequent and powerful earthquakes.

Did you know?

What are now the towering Himalayan mountains were once under the sea. This is why marine fossils are commonly found high up in the range.

While most of the above is generally accepted by geologists, there are many unresolved issues and findings that don't tie in with this story. For example, a large number of insects preserved in amber were discovered in Vatsan, 30 km north of Surat, in a geological zone called Cambay Shale. About 700 species of insects, representing fifty-five families, were found. But these insects were not unique to India. They were similar to those found in other countries in other continents, as far away as Spain. If we are to go by the currently accepted view about the northward drift of the Indian land mass, we have to believe that the subcontinent was an isolated island for tens of millions of years. But if these insects emerged then, how did they come to India? Were there other islands that allowed them to hop across to the subcontinent? Maybe the Indo-Asian collision happened earlier than what we think? We really don't know!

Nonetheless, India continued to push into Asia, making the subcontinent tectonically very active. This meant that there were many powerful earthquakes that took place during this time. This region is still very unstable. In 2005, an earthquake in North Pakistan and Pakistan-occupied-Kashmir registered a magnitude of 7.6 on the Richter scale and claimed 80,000 lives (note that the Richter scale is a logarithmic scale, so each point increase is equivalent of a ten-times increase in the amount of shaking and 31.6 times the amount of energy released).

There have been many far more powerful earthquakes that have been recorded along the mountain range. The Assam earthquake of 1950 registered a magnitude of 8.6 and is one of the most powerful earthquakes ever recorded. It happened in a sparsely populated area and yet killed 1500 people. Imagine if it had taken place in a

densely populated area—the lives of millions of people would have been in danger. This is why the Himalayan range is one of the most dangerous places to build large dams.

If the Aravallis are one of the oldest geological features, the Gangetic plains are among the youngest. They started out as a marshy depression running between the Himalayas and an older mountain range called the Vindhyas. Silt brought down by the Ganga and its tributaries began to fill up this hollow and create a fertile alluvial plain. The Ganga changed course repeatedly and shifted southward leaving behind **oxbow** or curved lakes that can still be seen. Early humans would have seen it all happening. The Ganga continued to drift southward and was arrested only when it nudged into the Vindhyas near Chunar (close to Varanasi). It is the only place in the plains where a hill commands such a view over the river. And that is why the Chunar fort was considered a strategic location in the times of warring kingdoms. It was once said that he who controlled the Chunar fort also controlled the destiny of India!

A walk through the fort is a walk through Indian history. The walls resonate with the tales of the legendary King Vikramaditya, the Mughals, Sher Shah Suri and Governor-General Warren Hastings. There are remains here from each era, including an eighteenth-century sundial. There are British graves below the walls, too. You must be familiar with the national emblem of India, of course.



ASHOKAN PILLAR

These are the Mauryan lions of Sarnath. They were carved out of the stone quarried from the south-west of the Chunar fort. We will return to them in [Chapter 3](#).

MOVE IT, PEOPLE!

Many people assume that the similarities between present-day Indian and African mammals are because India was once attached to Africa. Elephants, rhinos and lions are common to both. But, as we have seen, India separated from Africa during the dinosaur era. So actually, these big mammals came to India because of its geographical reattachment to Eurasia and the changing climate zones that allowed or forced these animals to migrate.

A genetic study of the frozen remains of a Siberian mammoth that died 33,000 years ago revealed that the Asian elephant is more closely related to the mammoth than to the African elephant! It appears that the genetic lines of the Asian and the African elephants separated six million years ago whereas the Asian elephants and the mammoths diverged only 4,40,000 years ago.

Many Indian animals also came to the subcontinent from the east. The tiger is one such example. Some say that the tiger came from Siberia while others say it came from South China. Two-million-year-old remains of the tiger's ancestors have been found in Siberia, China, Sumatra and Java but it's a relative newcomer to India. The Bengal tiger is believed to have come to India only about 12,000 years ago.

Where were the human beings when all of this was happening? Most scientists agree that human beings first evolved in Africa around 2,00,000 years ago. The San tribe of the Kalahari (also called the Bushmen) is probably the oldest surviving population of humans. A genetic study of the members of this tribe revealed that they show the greatest genetic variation of any racial group. This means that they are likely to be the direct descendants of the earliest modern human population.

What do we mean by 'modern humans'? Human beings, as we call ourselves today, are only one kind of hominids (the genetic classification of which humans are a part) to have walked the earth. More than a million years ago, pre-modern humans like *Homo erectus* used stone tools and had wandered as far as China and Java. When modern humans were evolving in Africa, their close cousins, the Neanderthals, were already well established in Europe and West Asia.

We are survivors from a large family tree. There were many challenges that modern humans had to meet in those times. The first attempt by modern humans to leave Africa was a failure.

Archaeological remains in the Skhul and Qafzeh caves in Israel show that modern humans may have made their way to the Levant

(the region immediately east of the Mediterranean) about 1,20,000 years ago. The planet was then enjoying a relatively wet and warm interglacial period, which would have allowed them to wander up north. However, this climatic period didn't last for long and a new ice age started. It looks like the early settlers who made it to this point either died out or were forced to go back. The Neanderthals who were better adapted to the cold probably reoccupied the area.

An ice age is a long period of time when the temperatures on the earth are so low that the ice covering the surface—glaciers, polar ice caps, continental ice sheets—expand. In the history of the earth there have been many ice ages that alternate with warm periods, when the ice melts, the sea levels rise and the climate is warmer. Just to make it a little confusing, though, within the time period of an ice age you also have shorter periods of warmer and colder temperatures that alternate! The colder periods are called glacial, because the glaciers grow, and the warmer periods are called interglacials.

For the next 50,000 years, our ancestors remained in Africa. Around 65,000–70,000 years ago, a very small number, perhaps a single band, crossed over from Africa into the southern Arabian peninsula. And it was from this group that all non-Africans descended!

Climate and environment had a very big impact on the expansion of modern humans. Our planet goes through natural cycles of cooling and heating. When the modern humans made their way out of Africa, the earth was much cooler and much of the world's water was locked in giant ice sheets because of the low temperature. As a result, the sea levels were as much as 100 metres lower than today and coastlines and climate zones were very different, too. The early band of humans migrating from Africa to southern Arabia would have had to make a relatively short crossing across the Red Sea. They would have also found the Arabian coastline to be wetter and better for survival.

After this, the modern humans made their way along the coast to what is now the Persian Gulf. The average depth of the Persian Gulf

is just 36 metres. With sea levels 100 metres below current levels, this area would have been a lush and fertile plain. It would have been paradise for the modern humans who are likely to have flourished and increased their numbers. Central Asia and Europe would have been very cold at this time because of the ice age. The modern humans must have spread out along the Makran coast into the Indian subcontinent.

At some stage, groups of the Persian Gulf people explored the Indian subcontinent more. But they weren't the first to do this. The Neanderthals from Europe steadily moved westwards till one of their last bands died out in a cave in Gibraltar. But we don't really know what happened to the pre-modern hominids of Asia.

Was it the eruption of the Toba volcano in Sumatra 74,000 years ago that led to the extinction of the pre-modern hominids of Asia? Excavations have shown that peninsular India was covered in volcanic ash from the eruptions. Experts still disagree on what really happened because of these eruptions but it's possible that they led to the disappearance of the pre-modern hominids, clearing the way for the modern humans.

The modern humans who had reached the subcontinent spread quickly through it and then to South East Asia. Some believe that the indigenous tribes of the Andaman and Nicobar Islands were maybe descendants of the earliest people who came into the region!

From here, one branch reached Australia around 40,000 years ago and became the ancestors of the aborigines. Studies have confirmed that the Australian aborigines have a genetic link with aboriginal tribes in South East Asia. However, for a long time, researchers couldn't find a direct genetic link between present-day Indians and native Australians. But in 2009, a study published by the Anthropological Survey of India found genetic traces to link some Indian tribes with native Australians. These were very tiny traces but still, they were there! The researchers suggested that the Indian and Australian groups had separated about 50,000–60,000 years ago.

We've talked about the adventurous people who left the Persian Gulf and went exploring. But what of those who were content to stay behind? The population that remained in the vicinity of the Persian Gulf and the subcontinent stayed there for several thousand years. Scientists think that many important genetic branches came from this area at this time. During the relatively warmer interglacial periods, sub-branches would have spread farther out into Europe, Central Asia and so on. But you have to remember that temperatures would have still been far lower than present-day levels and that there would have been many drastic climatic changes. Much of the Persian Gulf is now underwater, so it's not very easy to conduct research on the people who lived there.

This is a very short and simplified account of what happened over tens of thousands of years. We're talking about very small Stone Age bands of fifty to hundred people over vast expanses of time and space. Their movements would not have always been systematic. They might have wandered somewhere, come back, gone to places that didn't lead anywhere and so on. Just as there were groups coming into the subcontinent, there were others that were going out. Scientists think that India may have been the source of a number of genetic lineages that can now be traced worldwide.

Natural calamities, hunger, tribal wars and disease would have decided which of these groups survived and which of them didn't. There are plenty of remains of these early humans in Stone Age sites scattered across India. Bhimbetka in central India is one of the most extensive sites in the world. The hilly terrain is littered with hundreds of caves and rock shelters that appear to have been inhabited almost continuously for 30,000 years! It is now a UNESCO World Heritage Site.

Did you know?

There were once ostriches in the Indian subcontinent! Archaeologists have found beads and ornaments made from ostrich eggshells in Stone Age sites. Was it the Stone Age fashion industry that led to the disappearance of the bird?

The last full-blown ice age started around 24,000 years ago, reached its peak around 18,000–20,000 years ago and then warmed up. Around 14,000 years ago, the ice sheets began melting rapidly, the sea levels were rising around the world and weather patterns were changing. The Persian Gulf began to fill up 12,500 years ago. Around 7500–8000 years ago, the Gulf Oasis was completely flooded. Is this the event that is referred to as the Great Flood in Sumerian and Biblical accounts? It's quite possible!

Recent archaeology suggests that the people of the Persian Gulf moved to higher ground around 7500 years ago. They also seem to have learned how to travel by water. A small clay replica of a reed boat and a depiction of a sea-going boat with masts from this period have been found in Kuwait. By this time, people knew how to farm, domesticate animals and build boats. Some groups made their way into Central Asia, taking advantage of the warmer temperatures. Others might have made their way into Europe where earlier migrations had previously pushed out the Neanderthals. Groups from South East Asia had already established themselves in China and the warmer climate would have allowed them to expand.

The Indian coastline moved several kilometres inland to roughly resemble what we would now recognize on the map. The sea moved inland all along the coast and there were two places where very large land masses were flooded. One was where we now have the Gulf of Khambat (Cambay), just south of the Saurashtra peninsula of Gujarat. The other land masses extended south from the Tamil coast and would have included Sri Lanka.

In Indian mythology, one of the ten avatars of Vishnu, the Protector, is that of the fish. It is said that Vishnu took the form of a fish (Matsya) and warned Manu, the legendary king, about a great flood that would threaten all life. Manu built a large ship and filled it with seeds and animals. Matsya then towed the ship to safety. Doesn't this remind of you of Noah's Ark? Are these legends a memory of the ancient floods?

In 2001, marine archaeologists found two underwater locations in the Gulf of Khambat. They seem to be the remains of large settlements that would have been flooded about 7500 years ago. Scholars are still finding out the exact nature of these discoveries, but if proved, they would be truly remarkable. Though we don't know about these for sure yet, it is reasonable to say that the changes in weather patterns and the sharp rise in sea levels must have made people in those times move from one settlement to another.

Earlier, it was thought that people from the Persian Gulf area carried the knowledge of farming to other regions. There is evidence to show that some of the crops that were farmed systematically in the subcontinent, around 7000 years ago in Mehrgarh, Baluchistan, were West Asian species such as wheat and barley. Did this mean that Indians learned to farm from West Asian migrants and only later managed to domesticate local plants such as eggplant, sugar cane and sesame? But recently, researchers have uncovered evidence that Indians may have independently developed farming, including the cultivation of rice. Did the knowledge of farming travel from one region to another or did different groups develop it independently in around the same time? The evidence now suggests parallel development.

What we do know is that by the end of the Neolithic age, there was a fairly large population living in India. Who were these people? How are present-day Indians related to them?

WHAT DO YA MEAN, GENE?

Up to the early twentieth century, it was believed that India was inhabited by aboriginal Stone-Age tribes till around 1500 BCE when Indo-Europeans called 'Aryans' invaded the subcontinent, bringing with them horses and iron weapons. Indian civilization was seen as a direct result of this invasion. Though this theory didn't have any solid evidence to back it, it became a popular explanation for why Indian and European languages have similarities. It was also politically convenient at that time because it made the British colonizers appear as if they were merely latter-day 'Aryans' who'd come to further 'civilize' the local population.

The theory, however, took a beating when remains of the sophisticated Harappan civilization were discovered. These discoveries proved that Indian civilization was well underway even before 1500 BCE. But strangely, the 'Aryan invasion' theory was not thrown away. It was instead modified to suggest that a people called the Dravidians (supposed ancestors of modern-day Tamils) created these cities and that they were later destroyed by the invading Aryans. But this theory was also flawed because there is no archaeological or literary evidence of such a large-scale invasion. The Harappan cities did not suddenly collapse but suffered a slow decline because of environmental reasons.

India is a country with a bewildering mix of castes, tribes and language groups. Some of these groups came to India in historical times—Jews, Parsis, Ahoms, Turks to name a few. But there are also many populations that have lived in the country for a very long time. Many groups migrated to different parts of the country and settled there over thousands of years. So where a group is found today may not be where it came from originally. Over the years, most groups have mingled and yet a few have retained their unique identity even now—some of the tribes in the Andaman and Nicobar Islands and the North-Eastern states, for example.

What we have to remember when we study such a complex mix of people is that there are no 'pure' races. Indians come in all shapes,

sizes and shades and these variations can be quite dramatic even within the same family! But there are some patterns of genetic distribution that we can see.

What is a gene?

A gene is the basic physical and functional unit of heredity. Do you have eyes like your mother? Is your nose like your father's? All of this came to you through your genes! Genes are sections of long chains of molecules called DNA (deoxyribonucleic acids) that give instructions to make molecules called proteins, which then build our bodies. Every person inherits two copies of genes, one inherited from each parent. Over time these genes mutate or change slightly. The accumulation of these mutations over long periods is responsible for evolution.

In 2006, there was a study that said India's population mix has been broadly stable for a very long time and that there has been no major injection of Central Asian genes for over 10,000 years. This means that even if there had been a large-scale influx of 'Aryans', it would have taken place more than 10,000 years ago, long before iron weapons and the domestication of the horse. The study also suggested that the population of Dravidians had lived for a long time in southern India and that the so-called Dravidian genetic pool may have even originated there.

Another study published in 2009 suggested that the Indian population can be explained by the mixture of two ancestral groups—the Ancestral South Indian (ASI) and the Ancestral North Indian (ANI). The ASIs are the older group and are not related to Europeans, East Asians or any group outside the subcontinent. The ANIs are a somewhat more recent group and are related to Europeans. The ANI genes have a large share in North India and account for over 70 per cent of the genes of Kashmiri Pandits and Sindhis. But the ANI genes also have a large 40–50 per cent share in South India and among some of the tribal groups of central India.

Is the ANI-ASI split same as the Aryan-Dravidian theory? Firstly, the ANI and ASI are not 'pure' races. They are just different genetic mixes, each of which contains many strands. The terms 'Aryan' and 'Dravidian', on the other hand, are not just about genetics; they also carry strong cultural connotations. For instance, the 'Aryans' are usually linked to the Vedic tradition while the 'Dravidians' are linked to the Sangam literary tradition. But we can't conclude that this is the same as the ANI-ASI framework because these two groups emerged well before the Vedic tradition, Sangam literature, or the Harappan civilization. We are talking about small bands of hunter-gatherers and early farming communities rather than the thundering war chariots, iron weapons and fortified cities that are said to have been part of an 'Aryan-Dravidian' rivalry.

Did you know?

Manu, the Indian Noah, was said to have been the king of the Dravidians before the flood but is repeatedly mentioned in the Vedic tradition as an ancestor!

As we shall see, climate change and the drying of a river caused these two groups to mix very rapidly from around 4200 years ago. Simply said, after thousands of years of mixing, Indians are very closely related to each other and it is pointless to try and find out who is more Aryan and who is more Dravidian. There are also many groups in India that don't fit in within the ANI-ASI framework and which have influences from other parts of the world. Genetics has just confirmed what we can see for ourselves—Indians are a mongrel lot who come in all shapes, sizes and complexions!

What about the genetic links of North Indians to Europeans? And how do we explain the linguistic similarities between Indian and European languages if we don't accept the 'Aryan-Dravidian' theory? When we talk about a genetic link between North Indians and some Europeans and Iranians, what we're usually referring to is a gene

mutation called R1a1, and more specifically, a subgroup called R1a1a. This gene is common in North India and among East Europeans such as the Czechs, Poles and Lithuanians. There are smaller concentrations in South Siberia, Tajikistan, north-eastern Iran and in Kurdistan (that is, the mountainous areas of northern Iraq and adjoining areas). Interestingly, the gene is rare among Western Europeans, western Iranians and through many parts of Central Asia. But how is it that this gene is present in the Indian subcontinent and Eastern Europe while skipping Central Asia and Western Europe?

In 2010, it was discovered that the oldest strain of the R1a1a branch was concentrated in the Gujarat-Sindh-Western Rajasthan area, suggesting that this was close to the origin of this genetic group. European carriers of R1a1a also displayed a further mutation, M458, which is not found at all in their Asian cousins. Since the M458 mutation is estimated to be at least 8000 years old, the two populations must have separated before or during the Great Flood. Thus, the genetic linkages between North Indians and East Europeans are best explained by the sharing of a common ancestor, perhaps from just after the end of the last ice age. Does this also have to do with climate change? Maybe!

The most common gene in Western Europe is R1b. This is related to R1a1 and possibly also originated in the Persian Gulf area but the two separated a long time ago—probably during or before the last ice age. India has a relatively low concentration of R1b. Could we be dealing with two major genetic dispersals occurring from the Persian Gulf-Makran-Gujarat region at different points in the climatic cycle? One occurring at the onset or during the last ice age with R1b carriers heading mostly west and another occurring around the time of the Flood involving R1a1 carriers?

There is also reason to believe that some Indian tribes moved westward to Iran and beyond during the Bronze Age. We'll read more about that in the next chapter. Cultural linkages could have

also happened because of trade. The spread of Indian culture to South East Asia in ancient times and the popularity of the English language in the postcolonial period show that it is possible for cultural exchanges to happen even without war or large-scale migration.

IS THERE A LITHUANIAN IN YOUR FAMILY?

The caste system is not unique to India. Throughout history, we have seen different versions of the caste system in Japan, Iran and even in Classical Europe. What is remarkable about the Indian caste system is that it has survived over thousands of years despite changes in technology, political conditions and religion. Despite strong criticism and opposition within Hindu tradition itself, it has continued to exist.

It was once thought that the caste system originated because of the Aryan influx and the imposition of a rigid racial hierarchy. However, genetic studies have shown a largely South Asian origin for Indian caste communities. They suggest that Indian castes are profoundly influenced by 'founder events'. This means that castes are created by an 'event'—when a group separates out for some reason and later turns itself into an endogamous tribe. That is, marriages are restricted to the 'tribe'. Over time, this process leads to a varied social environment of groups and subgroups, sometimes combining and sometimes splitting off. Because of this, we don't have a single unified population but a complex networks of clans. Recent studies suggest that intermarriage between different groups was fluid 1900–4000 years ago—coinciding with the mixing of the ANI and ASI. However, about 1900 years ago, intermarriage became less common and the castes became more exclusive.

There is a difference between the genetic reality and the rigid and strictly hierarchical 'varna' system of castes described in the Manusmriti (Laws of Manu).

Varna is the term for the four broad categories into which traditional Hindu society is divided. The four varnas, in descending order in the hierarchy, are:
the Brahmins: priests, teachers and preachers
the Kshatriyas: kings, governors, warriors and soldiers
the Vaishyas: cattle herders, agriculturists, businessmen, artisans and merchants
the Shudras: labourers and service providers

The Manusmriti is often used by scholars as the framework to understand the caste system. It now appears that the description of this rigid system may have been a scholarly idea and it may have never really existed. Instead, what we have is a very flexible society where people from different castes adapted easily to changing times by altering their social roles. Till 1900 years ago, these groups also seem to have commonly intermarried but even after they became strictly endogamous, the status of different groups was fluid. For example, if a new group has to be accommodated, a new caste can be created. Similarly, a group can be promoted or demoted in status according to social conditions. This fits with what we know from historical experience, such as the emergence of the Rajputs in medieval times. In the past, it was advantageous for groups to move forward in the pecking order. But now, we have groups trying to be classified as 'backward' in order to benefit from affirmative action! The logic of both processes is the same.

Affirmative action is the policy of creating special provisions for people who belong to groups that have suffered from discrimination in some form. The reservation policy in India for certain caste groups is one such example.

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Hello, Harappans!

Much of what we know about India's early history comes from two very different sources, but archaeologists and historians are not quite sure how they fit together. On one hand, there is the archaeological evidence of the sophisticated cities of the Harappan Civilization. On the other hand, there is the literature of the Vedic tradition. Both are roughly from the same geography and timeline and we will listen to both the tales separately.

Though the two sources are different, there is one thing that they both agree on: the drying of a great river that the Rig Veda calls the Saraswati. No matter which way we look at it, the drying of this river was an important geographical event that defined early India.

BLAST FROM THE PAST

When the Lahore-Multan railway line was being built in the late nineteenth century, wagonloads of bricks for ballast were removed from some old mounds. The bricks were of very good quality and most people assumed that they must be from modern times. However, it was discovered that these bricks were, in fact, from a very old civilization, just like the Sumerians, the Minoans and the ancient Egyptians. This civilization was named the Indus Valley or Harappan Civilization.

Soon, more and more such sites were discovered. It took so long to discover the Harappan Civilization because they did not have grand structures like the Pyramids of Giza or huge palaces and

temples that immediately arrest attention. The Harappans did have large buildings but we don't know what they were used for. However, the Harappan Civilization is truly remarkable because of its urban design and active municipal management. These discoveries challenged the old theory about 'Aryan' invasions introducing civilization to India.

One of the large buildings from Mohenjodaro, a site in Sindh, has been identified as the Great Bath. But we don't really know if the structure was used for religious rituals, as a bathing pool for the royal family, or for some other purpose altogether!

We see meticulous town planning in every detail—standardized bricks, street grids, covered sewerage systems and so on. Similarly, a great deal of effort was put into managing water. Mohenjodaro alone may have had 600–700 wells! One of the bigger cities, it must have had a population of around 40,000–50,000 people. Not all cities had the same solutions to the same problems. At Dholavira in Gujarat, water was diverted from two neighbouring streams into a series of dams and preserved in a complex system of reservoirs. Many houses, even the small ones, had their own bathrooms and toilets connected to a drainage network that emptied into soak jars and cesspits. The toilet commodes were made from big pots sunk into the floor.

Did you know?

These ancient toilets came equipped with a 'lota' for washing up. Though we no longer use the same toilet design in our homes, the lota has survived in Indian toilets!

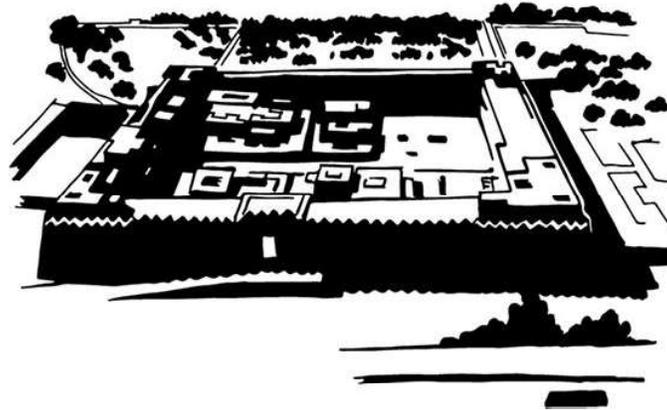
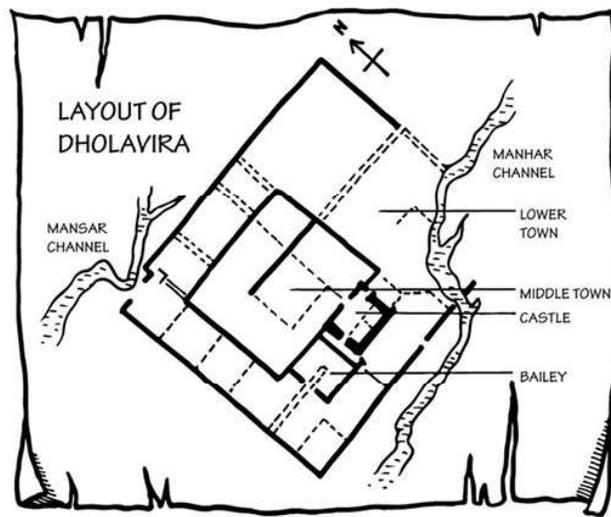
CAN YOU READ HARAPPAN?

Dholavira is a good example of a large Harappan urban centre. It is on an island in the Rann of Kutch. At the centre of the settlement is a

'citadel', which consists of a rectangular 'castle' and a 'bailey' (the outer wall of the castle). The citadel must have contained the homes of the rich as well as public buildings. The castle, which is the oldest part of the city, was heavily fortified with thick walls and equipped to withstand military attack. Early scholars who studied the Harappan Civilization believed that they were uniquely peaceful and that there were no signs of military activity. Then why did they require such walls?

In front of the citadel, there is a large open ground that could have been used for many purposes — military display, sport, royal ceremonies or maybe the annual parading of the gods. Archaeologists have found tiered seating for spectators along the length of the ground.

Beyond the ceremonial grounds was the planned area where the common citizens lived. This division into a Citadel and Lower Town is quite common in larger Harappan settlements. As the city grew, more and more people began to migrate into it and these migrants could not be accommodated in the planned city. So what did they do? They settled down just to the east of the original Lower Town—forming a 'slum' area, so familiar to many of our big cities today! However, the political leadership of Dholavira responded to the situation. They expanded the urban limits and included the slums into the city. The slums were redeveloped and the Harappan municipal order was imposed on them, too. And that's how Dholavira ended up with three sections—the Citadel, a Middle Town (the old Lower Town) and a new Lower Town (the redeveloped slum).



In 2001, an earthquake measuring 7.8 on the Richter scale killed 20,000 people in the state of Gujarat. The epicentre was not far from Dholavira. Indeed, this area was unstable even in those times and there were many earthquakes that would have affected the city and its development back then. What we see is not the popular image of a rigidly pre-planned city but that of an evolving urban settlement that responded in various ways to the challenges posed by nature and humans.

When we visit archaeological sites, we tend to see the ancient buildings in isolation. But imagine what a living city would have been like! Picture in your mind the crowds of soldiers, traders, artisans and bullock carts . . . how hot and dusty it must have been. Children like you would have played in its streets!