

Introduction to the review

There are more reasons than just curiosity to examine how our civilization came to be. History does not repeat itself, but it rhymes. A knowledge of the past is essential for predicting the future. This history begins well after the dawn of agriculture, but before literacy, in a part of the world most of which continued to live as foragers, though a few had only recently adopted farming and animal herding.

The book describes the refined understanding that had emerged in the decades prior to its publication in 2007, especially with the access to Russian scholarship and archeological sites available after the fall of the Soviet Union, and linguistic research made possible by increased computer power.

Anthony's analysis draws on historical, archeological, linguistic and forensic data. Although Luigi Cavalli-Sforza's pioneering analyses tracing human evolution and migration through genetic markers had been published a decade earlier, it is not referenced. The vast strides in genetic analysis made since 2007, notably in David Reich's recent [Who we are and how we got here](#) will strengthen but in some ways contradict Anthony's findings. Anthony, for instance, portrays the meeting of the farmers and pastoralists as mostly peaceful. Reich's genetic analysis tends to indicate that the pastoralists more likely subdued and replaced the farmers.

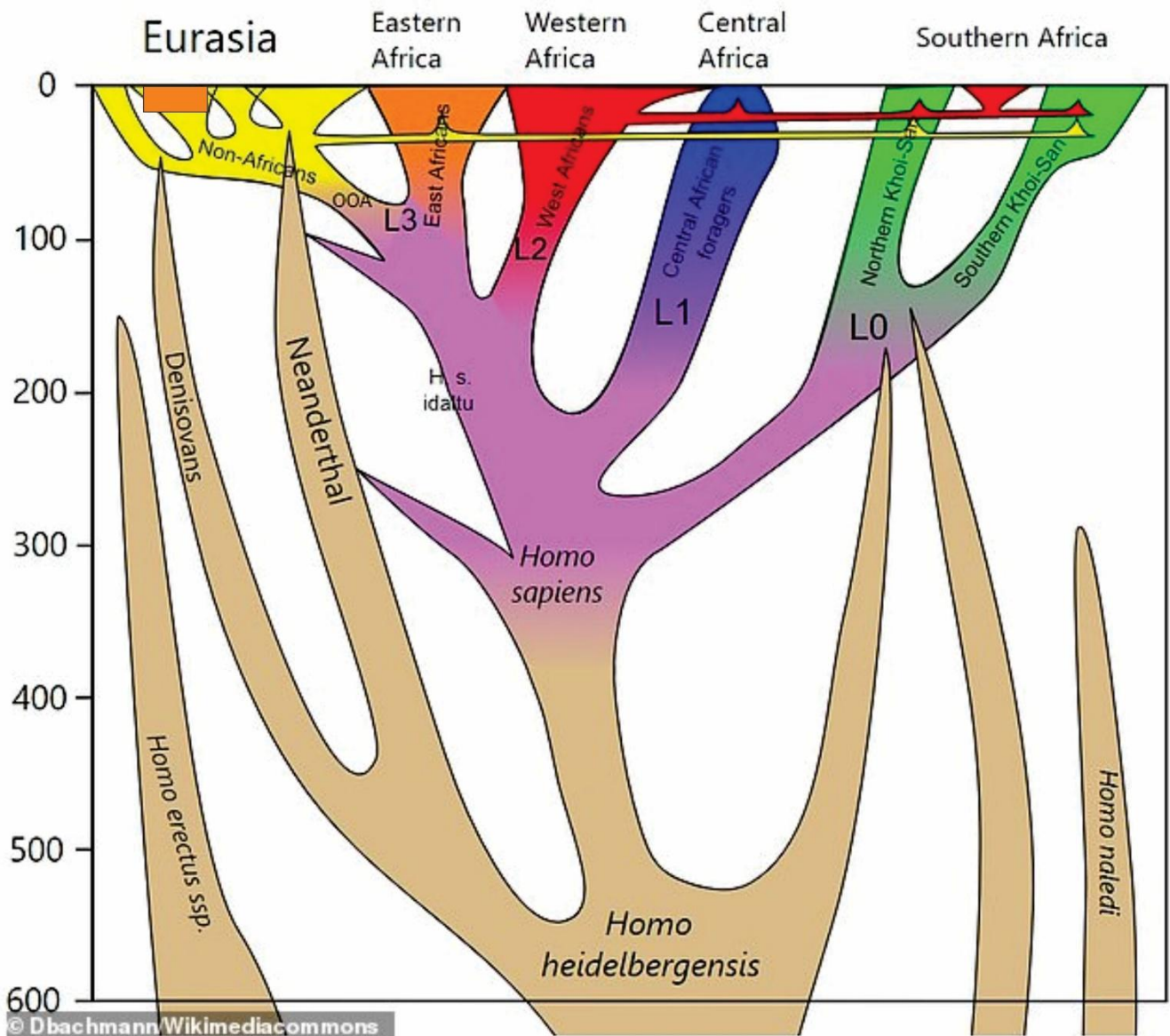
The Thesis

Indo-European languages emerged only between 2.5 and 4.5 thousand years ago, first appearing on the Pontic-Caspian steppes. In other words, the grassland stretching from the Black and Caspian seas north to the forests. These steppe people first mastered a lifestyle centered on the horse and the wheel. Not coincidentally, due to their favorable geographical situation, the same people became leaders in bronze-age metallurgy. Indo-European languages evolved rapidly and spread with the power and influence of those who spoke them.

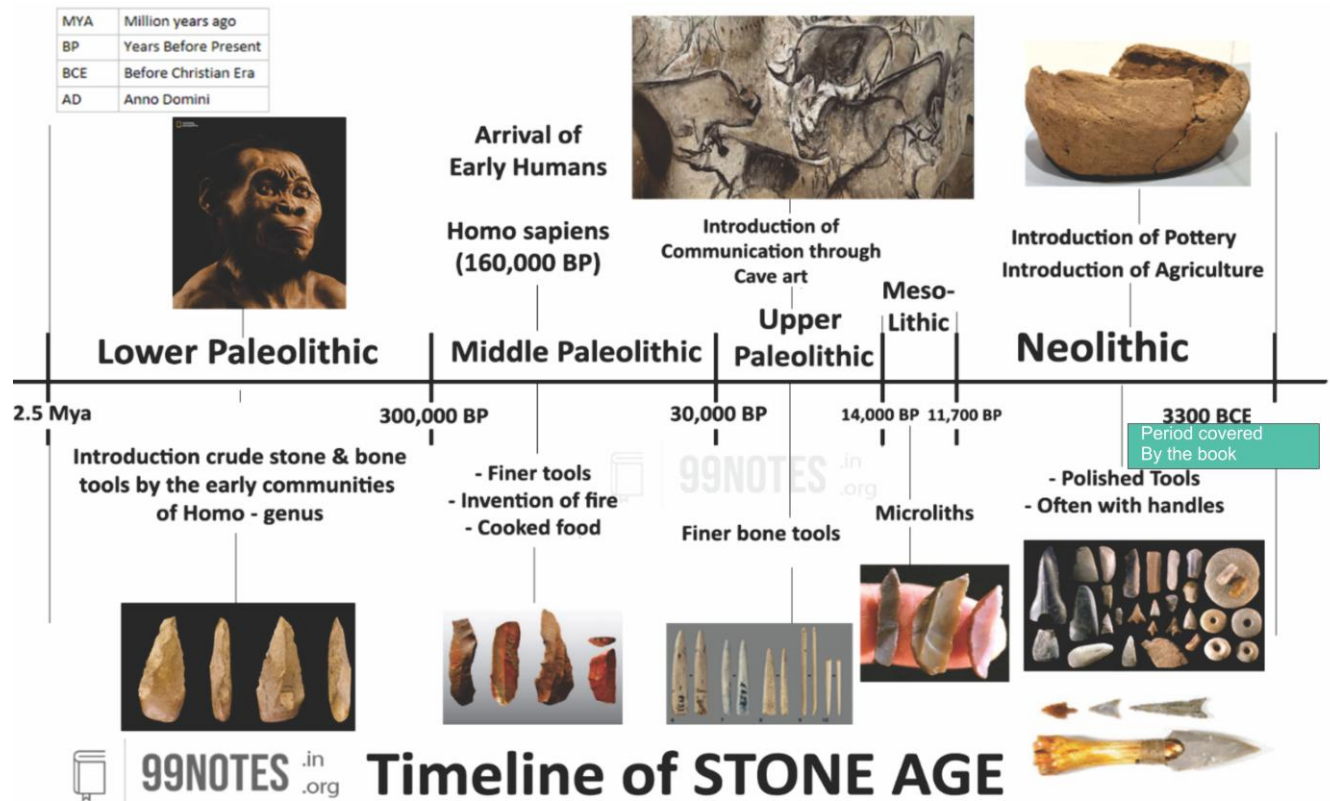
The broader historical perspective

We recognize that there are fundamental affinities among groups of people. The largest such groups are characterized as races, most commonly characterized as African, European, Middle Eastern, East Asian, and American Indian. Members of these groups have been shown to be grouped genetically, in Luigi Cavalli-Sforza's *Genes Peoples and Languages* and David Reich's more recent [Who We Are and How We Got Here](#).

Evolution separated humans from chimpanzees about seven million years ago. Then, the Homo Sapiens branch of the European Homo Heidelbergensis parted company with Neanderthals and Denisovans and crossed the Mediterranean. The subspecies partially recoupled after migration back into Europe maybe 70,000 years ago, the same time the non-African branch evolved into today's non-African races. The relative brevity of the timeframe covered by this book, and the limited breadth of its impact on the human species, is represented by the little orange rectangle at the top left of the following diagram.



Homo Sapiens continued to evolve after moving north. The increasing tempo of change since the evolution of Homo sapiens 300,000 years or so ago in Africa is reflected in the rapidly decreasing lengths of the stone-age periods defined by anthropologists, represented by the logarithmic timeline in the diagram below.



Agriculture began within a couple of thousand years of the end of the last ice age, the beginning of the Neolithic as shown on the diagram above. As above, the period covered by the book is represented by a rectangle, this one green.

Anthony describes how the world changed over this period. The Black Sea (or Pontic) / Caspian steppes are at the western end of a continuous belt of grasslands which rolls east all the way to Mongolia. The bitter cold of steppe winters was the most serious limiting factor for humans and animals. The dominant mammal of the interior steppes was the wild horse.

Between about 14,000 and 12,000 BCE the warming climate that ended the last Ice Age melted the northern glaciers and the permafrost. That released their combined meltwater in a torrential surge that flowed south into the Caspian basin, which runs from the Ural Mountains in the middle of Russia down to Iran. The late Ice-Age Caspian ballooned into a vast interior sea, with different forager cultures evolving to its east and west. The foragers east of the Ural River were two millennia later in adopting pastoralism than the west.

Around 11,000–9,000 BCE the Caspian finally rose high enough to overflow catastrophically. A violent flood poured westward, through the modern Don river valley, into the Black Sea, which was well below sea level. The Caspian then fell back into its own basin. Later, about 5,600 BC, a rising Mediterranean cut through the Bosphorus to the Black Sea, raising it further to the level of the world's other oceans. This is the approximate date of the green rectangle showing where Anthony's story begins.

Genetic evolution, which Anthony does not address, would tell only a fraction of the story. Language, culture and technology are generally more dramatic over shorter time frames. The increasing tempo of change since the evolution of *Homo sapiens* 300,000 years or so ago in Africa is reflected in the rapidly decreasing lengths of the stone-age periods defined by anthropologists, represented by the logarithmic timeline in the diagram above.

The Evidence

The brilliance of Anthony's account is the way in which he draws evidence from many different directions, among them physical anthropology, cultural anthropology, linguistics and geological history,

Physical Evidence

Archaeologists unearth and analyze the many types of physical remains of past human societies, from which they make inferences about long-forgotten people and their cultures.

Organic Remains

All life forms leave organic remains that can be found and analyzed. The most common place to find human remains are burial and battle sites. We also leave behind the remains of our meals in the form of bones, seeds, husks and the like.

Skeletal remains yield evidence of nutrition and diet. Skeletal wounds are evidence of the ferocity of battle and the types of weapons used. The placement of graves and orientation of bodies provide clues about religious beliefs. The ratio of men to women among the skeletons attests to their different roles in society.

Non-human organic remains can be used to determine the environment in which people live. Pollen tells scientists which species of trees, grasses and edible plants were in the environment. Wood, fossilized or otherwise, informs them about the canopies under which people and animals lived. The growth rings can be used to reconstruct weather conditions on a year-by-year basis.

All organic remains in the epochs described in his book are well within the carbon-14 dating horizon. It has since undergone several refinements. C14 levels are adjusted for people who absorbed a lot due to a high fish diet by factoring in nitrogen isotopes.

Artifacts

Human artifacts were frequently simply lost or discarded, such as pottery shards, or buried as grave goods. They include, tools, weapons, art, jewelry and money, among other things. Anthropologists categorize them by their materials, style, purpose and the C14 dates of the organic material among which they are found. Scientists infer the evolution of inequality from the richness of some later Indo-European grave goods, in contrast to the lack of ostentation of those of the Old Europeans. The abundance of female fertility figurines among the farmers, and their lack among the steppe pastoralists, is another indication of the different roles played by women.

Language

Language changes rapidly as civilizations evolve, providing clues about human activities and migrations. The several aspects of language evolve in different ways and at different tempos. Anthropologist Anthony studied linguistics in order to trace the evolution of Indo-European languages and hence the inventions, contacts and migrations of the people. The following sections describe his use of the various aspects of language.

Grammar

Grammar, the rules for forming speech, is a major device used to group languages. Indo-European languages other than English still use genders (masculine, feminine, neuter). Germanic and Slavic language still use cases, as did Latin, to designate the subject, object, indirect object and other nouns within a sentence. All Indo-European languages use tenses to indicate time (will do, does, did) and certainty: (would, should, could).

As a rule, grammars grow simpler over time. The simplicity of English in comparison with German provides a clue that the German forms were the original. We witness English being simplified as thou becomes you and sawn becomes sawed.

Word Roots

The offshoots of a more ancient language usually carry forward cognates of words that came into use as it was being spoken. Anthony shows that most Indo-European languages share cognates for wheel, horse and wool, which came into use over the period under study.

Sound shifts

Sounds, like grammar, become simpler over time. One of Anthony's examples is the word for hundred. Originally something like "kentum," with a rough K sound, it evolved into cent (pronounced saunt in French), ciento in Spanish, sot in Slavic languages and hundert in German. The sound shift from K through Kh to H is also systematic. Words for a hundred may differ, but all are easier on the tongue and throat than the original. Such sound shifts migrated more or less with the people speaking the languages.

Borrowing

As peoples of different cultures learn from one another, the borrowing culture may keep the original word. Anthony's example is taurus, bull, borrowed from Anatolian into Indo-European. He credits the steppe pastoralists with the root word that evolved into king, the Latin Rex and its cognates such as roi, rey, royal and so forth, and chief. He infers from this that Old European farmers did not have such hierarchical societies.

Ethics

Human behavior had to evolve as our societies changed. In the early days of agriculture, before the epochs reported in this book, people had had to learn how to live in groups large enough that not everybody knew each other by name, and how to trade with strangers.

Anthony writes about the changes in ethics and social practice that came with farming and pastoralism. He projects that it took many generations for people to learn that, famine or not, they could not eat their seed corn or slaughter their breeding stock. They had to evolve an ethos of deferred gratification, thought for the future.

Anthony writes that whereas the farming societies were relatively egalitarian, the proto-Indo-European pastoralists were not. Successful herders could become rich. Lending and borrowing livestock became an established practice. Rich people became patrons, throwing feasts and supporting clients. Social rules evolved defining the obligations of hosts and guests. Anthony notes that guest and host have a common root in antiquity. The same root, gast, serves both meanings in Ukrainian.

The evolution of language corroborates the observed evolution of social practices – masses of animal bones dating from the same elaborate feast, for example. Feasts that only began to take place after pastoralism had made some pastoralists rich enough to host them, and developed enough trade and patronage contacts with other groups that such hospitality made sense.

The Timeline

Anthony's book generally proceeds chronologically through the period from approximately 4,500 BC through 2,500 BC –middle copper age through middle bronze age. He describes several categories of changes. Copper was probably discovered about 6,500 BC in the process of firing pottery, especially colorful glazes, with the advent of bellows to increase temperatures. Copper's use spread with the discovery of ore deposits and improvement of smelting techniques.

Smelted copper commonly includes one percent of arsenic. About 3,500 BC they discovered that two percent and more of arsenic makes a bronze that is significantly harder than pure copper and yet easy to work. It made better household implements and bladed weapons. Tin bronze, even harder and not poisonous, though more difficult to work came into use as tin mines were slowly discovered.

As the steppe pastoralists pushed into the interior of Asia, they encountered rich mineral deposits around Sintashta in Chelyabinsk Oblast of the Ural foothills and the Zeravshan River running through Kirgizstan, Kazakhstan and Uzbekistan. The rich herdsman became richer metallurgists. Anthony credits them with creating the war and racing chariots that would become famous in civilizations far to their south.

The major crops – einkorn, spelt and emmer wheat, grapes and fruits, had been brought under cultivation in the Middle East. The domestic animals being herded at the beginning of his account, sheep, goats, cattle and pigs, had likewise been domesticated in the Near East.

Anthony's account opens about the time horses were first herded as meat animals. They were harder to manage than the original domestic animals, but they had the advantage of knowing how to push aside snow for forage and break ice to drink. On the steppes where they had evolved, they were easier to keep.

The innovation of riding horseback made it possible to triple the size of animal herds and to pasture them deeper in the steppes. More animals meant more wealth. Some pastoralists became rich. Societies evolved mechanisms to deal with inequalities of wealth.

Wheels came into use in the Bronze Age. Anthony describes the evolution of wheels themselves from solid wood to spoked designs, and of wheels attached to rotating axles and rotating on axles. He ends the book with war chariots, light vehicles pulled by two horses that had to be independently reined to steer around corners as the riders launched javelins.

The major innovation in clothing was wool. A mutation among sheep about 4,000 BC gave them long hair that could be spun into thread, as had long been done with flax to create linen. Wool had many advantages, warmth among them.

Meeting of Two Civilizations

While the book is primarily about the evolution of Indo-European society, technology and language, it also describes the parallel evolution of cultures bordering them on the south, east and west. Anthony calls those that went west the Old Europeans.

Old Europeans

Farming originated in Mesopotamia, from which it spread, primarily by cultural contact, east and west. Feeding a tribe of foragers takes about two square kilometers of land per person. Farmers require far less land, and farming is a somewhat more dependable source of nourishment. As population grew, foragers took up farming and pastoralism from their neighbors.

The practice of farming spread west via Turkey, Greece and Bulgaria towards Ukraine. By 5,700 to 5,500 BC the first cattle sheep goat pig herders arrived in the Danube. They generally lived in permanent settlements where they also grew wheat, grapes and fruit trees.

These people probably spoke a derivative of some language that had been spoken in Turkey. Anthropologists identify their skeletal remains as “gracile,” with slender bodies and fine-featured faces in comparison with the foragers who would become Indo-Europeans.

Later Old Europeans, the Cucutine and Tripolye people living about 5,000 BC, had large two-story houses in large towns. Though comfortable and prosperous, there is little evidence of palaces and fortresses to suggest hierarchical social organization.

The Old European cultures did not extend east of the Dnieper River. The town of Tripolye, where remains were discovered in 1899, is on the west (right) bank about 60 km south of Kyiv.

Spread of the steppe people

The steppe grasslands extend from the lower Danube in modern Hungary and Romania east to Manchuria and China.

The foraging people of the steppes, from whom the Indo-Europeans are descended, had prior to 5,500 BC no crops, and no domestic animals. They collected wild berries, fruits and nuts in season. They fished in the rivers and hunted deer, wild boars, auroch (wild cattle), onagers (wild donkeys) and wild horses. They adopted pottery and pastoralism from their Old European neighbors in, among other places, the valleys of the Prut, Dniester and Southern Bug rivers of western Ukraine and Romania.

Wild horses, which had evolved on the steppes, were able to cope with harsh winters. The long--domesticated livestock they got from the Old Europeans had to be sheltered in winter by retreating to swamplands that better resisted ice and snow. Though wild horses were ill-tempered and hard to tame, it was worth the effort. Five millennia after the Mesopotamians started herding animals for food, the steppe people added domesticated horses to their diet about 5,200 BC.

The temperate geography in which the Old Europeans and the Proto-Indo-Europeans met suited the two groups' separate methods of feeding themselves. There was adequate rainfall for the farmers, adequate pasture for the animals, and mild enough winters for the domestic animals that they had brought with them from the Middle East. Herders could live on the edge of the steppe and take their livestock out to graze the return someplace protected at night and over the winter.

As they became more familiar with pastoralism, they moved eastward, farther from the forests. Significant settlements emerged around Odessa, then the Dnieper River rapids near present day Zaporizhia, Mariupol, and later farther into Russia up towards modern Samara, north of the Caspian Sea and Chelyabinsk in the Ural foothills.

As they migrated away from the large oceans, rivers and forests they became increasingly dependent on their livestock for food. It worked because along the way and over the years they learned how to on herd from horseback. This allowed them to manage larger herds of whatever animals were best suited out on the on the open steppe. Horse pastoralists were able to raise enough food that they

could grow rich by exchanging their animals and animal products for metals and other exotic items. Conspicuous displays of wealth, such as large feasts, became common.

Whereas early pastoralists had considered sheep and goats almost interchangeable, about 4,000 BC some mutant sheep started growing longer hair. Already used to making linen from flax fibers, the steppe people rapidly learned to spin wool into thread which they could then weave into fabrics. Sheep came to outnumber goats. Skeletal remains of young goats and old sheep imply that they valued the sheep for wool. Cattle were also allowed to live full lives, implying increased use of dairy products. The mutation affording lactose tolerance to humans also dates from this period. The pastoralists could grow rich trading secondary products as well as meat.

The wagon was another invention essential to their progress into the deep steppe. Carrying all of their possessions with them, the horsemen of the steppe could follow their animals as they ranged over long distances in search of forage.

Horse technology improved, as metal replaced fabric for horse cheek plates bits and materials used in wagon construction. Wheel technology improved, as they went from solid disks of wood to spoked wheels. They abandoned rotating axles for wheels that rotated on axles. Though proper bearings would not be invented until the 18th century, speed increased as continual improvements reduced the friction slowing spinning wheels.

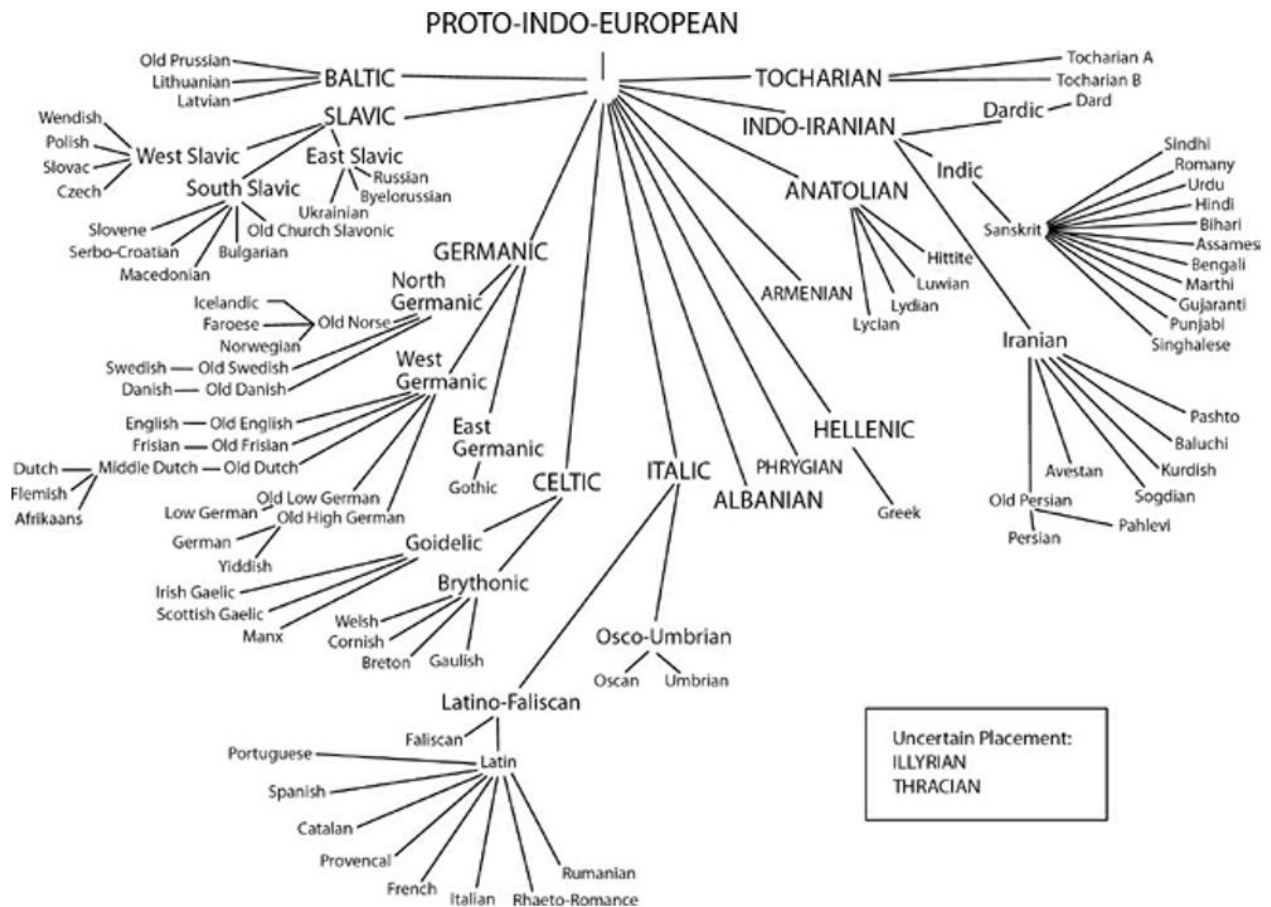
As noted above, inhabiting a mineral-rich geography, steppe people between the Urals and Caspian Sea became master metallurgists. In the second millennium BC they invented the war chariot.

Indo-European Languages

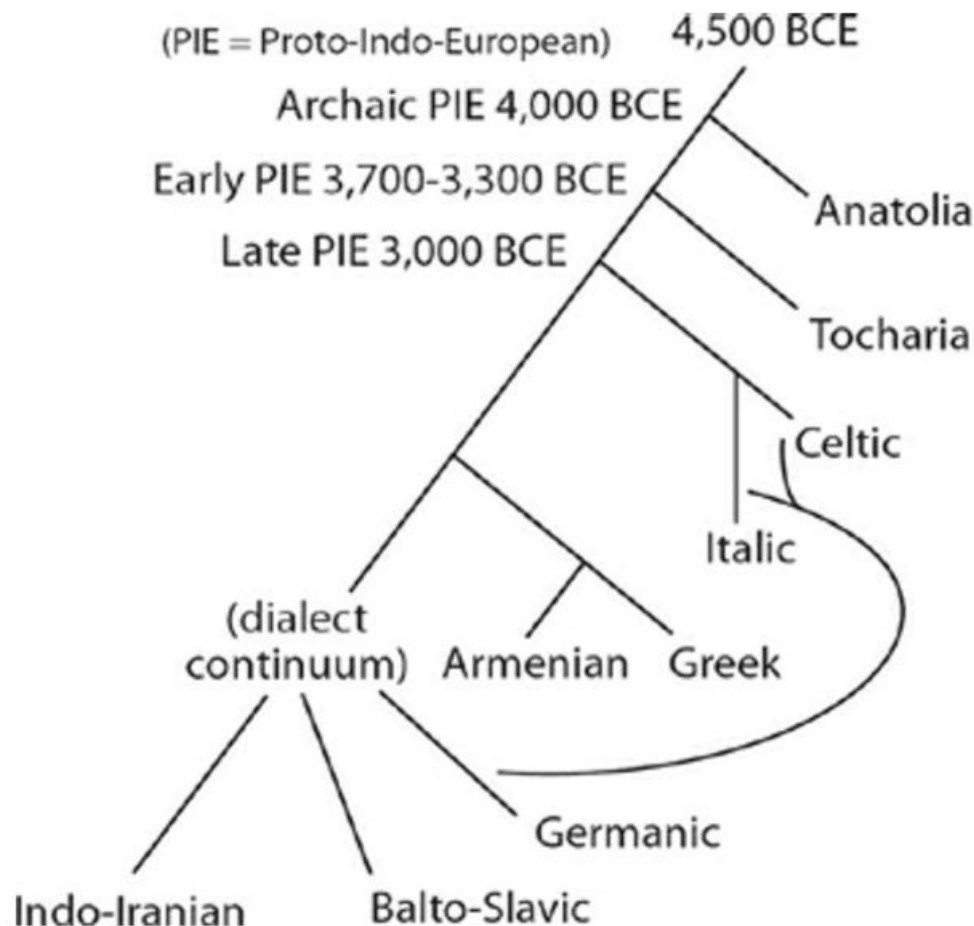
Although Anthony finds language to be a powerful tool in tracing the evolution and migration of Indo-European peoples, the diversification that led to modern languages mostly took place after the periods covered in this book. Anthony's chart below begins in the same epoch that his chronology of migrations and innovations ends.

<i>Language Branch</i>	<i>Oldest Documents or Inscriptions</i>	<i>Diversity at That Date</i>	<i>Latest Date for Proto-Language for the Branch</i>	<i>Grouped with</i>
Anatolian	1920 BCE	Three closely related languages	2800–2300 BCE	No close sisters
Indo-Iranian	1450 BCE	Two very closely related languages	2000–1500 BCE	Greek, Balto-Slavic
Greek	1450 BCE	One dialect recorded, but others probably existed	2000–1500 BCE	Indo-Iranian, Armenian
Phrygian	750 BCE	Poorly documented	1200–800 BCE	Greek? Italo-Celtic?
Italic	600–400 BCE	Four languages, grouped into two quite distinct sub-branches	1600–1100 BCE	Celtic
Celtic	600–300 BCE	Three broad groups with different SVO syntax	1350–850 BCE	Italic
Germanic	0–200 CE	Low diversity; probably the innovations that defined Germanic were recent and still spreading through the Pre-Germanic speech community	500–0 BCE	Baltic/Slavic

He offers, without a timeline, the following diagram of how languages evolved. We note that very few languages today would be recognized by speakers of a millennium ago. Within that timeframe Slavic split into Ukrainian, Belarussian and Russian, among others; Spanish split from Portuguese. Languages evolve by decades. Anthony is not interested in the modern languages so much as the ways in which they evolved away from each other, in order to estimate when the speakers of those languages parted company.



This far simpler diagram does tie language evolution to a timeline.



The best branching diagram according to the Ringe–Warnow–Taylor (2002) cladistic method, with the minimal separation dates suggested in this chapter. Germanic shows a mixture of archaic and derived traits that make its place uncertain; it could have branched off at about the same time as the root of Italic and Celtic, although here it is shown branching later because it also shared many traits with Pre-Baltic and Pre-Slavic.

Conclusion

Indo-European languages spread with the success of the steppe people who spoke them. The people evolved technologies such as horses, wagons, metals and wool that enabled them to exploit the huge, hitherto forbidding expanses of steppe land. As the elites within Indo-European societies grew rich, they developed social mechanisms to legitimize and control inequity. These included hierarchical organizational structures, patron-client relationships, guest-host relationships, armies and governments.

Cultures evolve by emulation, as adjoining cultures learn from one another, and by replacement and/or intermarriage. Subsequent works, such as that on genetics by David Reich cited in the beginning of this review, provide evidence of which it was. He concludes from analysis of the genomes of the speakers of modern Indo-European languages that the Indo-Europeans prevailed by conquest and intermarriage. Given Anthony's strong case for the martial advantages of mounted riders and chariot warfare, it makes sense. Indo-European dominance continued until the twentieth century; see, for example, [Why did Europe Conquer the World](#).

Internet searches repeatedly come back to this book. It obviously remains a key source for understanding the history of European peoples.