

# The Emergence of Proto-Indo-Europeans as Nomadic Pastoralists

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Introduction: Indo-Europeans' Nomadic Pastoralist Origin

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## Introduction: Indo-Europeans' Nomadic Pastoralist Origin

Indo-European languages are spoken around the world. English, which is currently the standard for international communication, as well as most European languages, such as Spanish, French, German and Russian, and non-European languages from Persian to Hindi, all belong to the Indo-European language family. According to the Steppe (or Kurgan) hypothesis, Indo-European languages are based on a language spoken by a group of pastoral nomads who inhabited the steppes in the north of the Black and Caspian Seas about 5,500 years ago.<sup>1)</sup> Known as Proto-Indo-Europeans, they presumably spoke the prototypical language. Eventually, their descendants conceived their own style of governance and forced their civilization on the world through a novel organizing principle (i.e., the function-oriented principle) that became the global standard. Accordingly, they achieved hegemony in the world.

Much time has passed since the Europeans settled somewhere and became sedentary; they no longer seem to retain many nomadic pastoralist elements;<sup>2)</sup> nevertheless, the

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- 1) This timing is agreed upon as the beginning of Yamnaya culture. Various ages for the breakup of the Proto-Indo-European language are proposed in the period between 6700 BCE and 4500 BCE (KLEJN et al. 2018: 4-5). Two main hypotheses are proposed regarding the origin of the Proto-Indo-Europeans: the Steppe (or Kurgan) hypothesis and the Anatolia hypothesis. At the moment, the Steppe (or Kurgan) hypothesis is predominant among researchers. For example, it is sustained by a recent genomic study (HAAK et al. 2015).
  - 2) Looking at the ecology of the nomadic peoples on the present-day Eurasian continent, some peoples are still nomads, such as the Mongols of the Mongolian Plateau at the center of the Eurasian

vestiges of the original traces, which are carved into their culture, may also have been etched into today's society and economy. If this is true, it is critically important to identify the pastoralist elements of the first stage of their existence for a better understanding of the present-day society and economy.<sup>3)</sup>

I will show that the nomadic pastoralists pioneered an organization composed of heterogeneous members, i.e., humans and animals, and provided a novel organizing principle, i.e., the function-oriented principle. Furthermore, Proto-Indo-Europeans, who used dogs to manage their flocks, conceived a three-tiered organizational structure, an innovation that contributed to cultivating their competitiveness in conquering the world.

## 1. The Formation of Proto-Indo-Europeans

Cereal farming, especially barley and wheat, began in the *Fertile Crescent* region of

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steppes, the Uighurs of East Turkistan, and the Tibetans of the Tibetan Plateau. However, there are almost no nomads in the western part of the Eurasian steppes anymore. Nomads are also present among the Arab Bedouins in the arid regions of West Asia, the Berbers in the Maghreb, and the Maasai in Africa (cf. *NOMADS - THE FACT*. <https://web.archive.org/web/20020827162704/http://www.newint.org/issue266/facts.htm>). Much research has been conducted on these existing nomads in ethnology and cultural anthropology, and excellent results have been accumulated. However, the nomads these surveys targeted are, of course, the currently existing nomads. The image of nomads today is of poor, vulnerable, and pariah-like peoples who are often tossed about by drastic changes in the environment and forced into insular areas. When we come across descriptions of nomadic people's aggression, such as "The impact of these Nomad eruptions upon the lives of the sedentary victims is so catastrophic that the sedentary observers have been inclined to postulate a demonic force of will and strength of purpose in the Nomads to account for such vast effects upon the sedentary societies' fortunes" (TOYNBEE 1948: 396), we do not really feel it when we look at the nomads of today. In fact, Proto-Indo-Europeans were once nomadic pastoralists; however, the majority left the homeland by about 2500 BCE, leaving the steppes behind and eventually conquering and ruling the agrarian sedentary peoples of the plains. It is important to note the difference between those who remained nomadic and those who ceased to be nomadic in the early epoch. The present-day nomads of Mongolia, Tibet, and Africa, as field studies have revealed, give the impression of being poor vagabonds, so to speak, parasites in contemporary market society. We should not apply the present state of peoples who have been nomadic for 7,000 years to the willing (Indo-European-speaking) people who escaped from the steppes and quit nomadism (although they were nomadic only 1,000 to 2,000 years) at the first opportunity. The task at hand is to determine what the Indo-Europeans left behind and what they retained in their imprinted nature after quitting nomadism.

- 3) An example of a comprehensive and exhaustive study in this domain is David Anthony's book (2007), which significantly advanced the related research. The book's subtitle, *How Bronze-Age Riders From the Eurasian Steppes Shaped the Modern World*, clearly indicates his academic interest in the historical origin of the present-day world. In this paper, I rely on his book to develop arguments on many subjects.

Mesopotamia around 8000 BCE; goats and sheep were domesticated between 6500 BCE and 6000 BCE, and irrigated agriculture in the Mesopotamian alluvial plain began around 5000 BCE. The agro-pastoral culture that started in the Orient spread to Europe from Greece through the Balkans at a relatively early stage. Eventually, agricultural settlers came into contact with hunter-gatherers around the steppes, and the latter gradually adopted agro-pastoral culture. The hunter-gatherers who learned to herd animals moved to the steppes and started engaging in nomadic pastoralism by around 5000 BCE. Thus, Proto-Indo-Europeans, who were originally hunter-gatherers, came into contact with sedentary agriculturalists, acquired agricultural and pastoral culture, and progressively became nomadic pastoralists (JACOBSEN and ADAMS 1958; ADAMS 1974; BELLWOOD 2005).

### **1-1 Sredny Stog Culture (ca. 4400-3400 BCE): Early Proto-Indo-European-Speaking People**

In the northeastern part of the southern Balkan Peninsula, where the Cucuteni-Trypillia culture was established, the Pontic-Caspian steppe stretches, and hunter-gatherers lived in the border area between the steppes and the southern plain. These hunter-gatherers came into contact with Cucuteni-Trypillia culture (and Kris culture), and by about 5200 BCE, they had acquired an agro-pastoral culture and began rudimentary farming and livestock rearing (Bug-Dniester differentiation) (MALLORY 1989: 233-234; ANTHONY 2007: 147-148, 231-234).<sup>4)</sup>

About 600 years after the end of Bug-Dniester culture, an agro-pastoral culture characterized by horse husbandry was formed further to the east, from the east bank of the Dnieper River to the steppes. These hunter-gatherers' sedentary agro-pastoral culture is called Sredny Stog culture (ca. 4500-3400 BCE), the bearers of the Sredny Stog culture were hunter-gatherers presumably speaking a different language from the farmers who came from Anatolia. Sredny Stog people are considered to be the predecessors of Proto-Indo-Europeans. Thus, in the northern steppes of the Pontic-Caspian Sea, hunter-gatherers started practicing nomadic pastoralism around 4500 BCE (although they were still herding mainly bovines at this time). In the Proto-Indo-European ancestor languages, there were a series of agricultural words such as 'harrow' and 'wheat,' and when the Proto-Indo-Europeans formed a distinct society, they possessed the characteristics of both nomads and farmers. The reason that Proto-Indo-Europeans are defined as semi-nomadic and semi-pastoral is probably because they settled and engaged in farming as well (MALLORY 1989: 197-205; ANTHONY 2007: 239-249).

Sredny Stog culture, which began with the introduction of bovine husbandry to the

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4) VIDEIKO (1994) provides detailed information about the interaction between Cucuteni and the steppe peoples.

steppes around 5200 BCE, coupled with simultaneous population migration, marks the epoch-making period when the earliest Proto-Indo-European languages were spoken on the steppes. Anthony summarizes the characteristics of this culture as (1) the maturation of the steppes' internal economy, (2) the maturation of social networks, and (3) the establishment of a new relationship with *Old Europe* (ANTHONY 2007: 240).

### **1-2 Yamnaya Culture (ca. 3500-2300 BCE): Late Proto-Indo-European-Speaking People**

By about 3500 BCE, the hunter-gatherers on the steppes had fully mastered early agriculture and livestock breeding. Thus, from the mid-4<sup>th</sup> to the mid-3<sup>rd</sup> millennium BCE, Bronze Age culture emerged in the steppe region between the Dniester and Ural rivers (on the Pontic-Caspian steppe). Hunter-gatherers came into contact with advanced agrarian settlers and accepted and mastered agro-pastoral culture. Consequently, they temporarily settled in the area; among the settled people emerged those who advanced to the steppes and began nomadic pastoralism. The bearers of this culture are the Late Proto-Indo-Europeans, and the area where this culture developed is considered to be the homeland of Proto-Indo-Europeans (MALLORY 1989: 210-215; HAAK et al. 2015).

As Early Yamnaya culture spread throughout the northern Black Sea-Caspian steppe by 3300 BCE, interregional variation occurred. Consequently, Late Proto-Indo-European-speaking peoples began to inhabit a variety of regions. As a part of this process, nomadic cultures eventually spread to the Danube River basin, and *Old Europe* ultimately collapsed in the end.

The Yamnaya people lived a nomadic lifestyle, riding horses and nomadizing; however, they also farmed in the cultivated areas along the river. The original hunter-gatherers accepted agro-pastoral culture through contact with Cucuteni-Trypillia culture and then applied livestock culture to the steppe environment. Several technological innovations had to be realized for nomadic pastoralism to occur on the steppes (ANTHONY 2007: 300-339).<sup>5)</sup>

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5) "The societies that probably spoke classic Proto-Indo-European — the herders of the Yamnaya horizon — are introduced in chapter 13. They were the first people in the Eurasian steppes to create a herding economy that required regular seasonal movements to new pastures throughout the year. Wagons pulled by cattle allowed them to carry tents, water, and food into the deep steppes, far from the river valleys, and horseback riding enabled them to scout rapidly and over long distances and to herd on a large scale, necessities in such an economy. Herds were spread out across the enormous grasslands between the river valleys, making those grasslands useful, which led to larger herds and the accumulation of greater wealth." (ANTHONY 2007: 133)

## 2. The Dividing Line in the Development of the Steppe Pastoralist Economy in the Middle of the 4<sup>th</sup> Millennium BCE

### 2-1 **The *Secondary Products Revolution* and Its Advance Into the Steppes**

In papers published in 1981 and 1983, Andrew Sherratt formulated the *Secondary Products Revolution*. He argued that the initial purpose of animal domestication was, first and foremost, to obtain meat, which he named the primary product. Primary products refer to products that can only be acquired through the death of the animal, i.e., once in its life: e.g., meat, flesh, skin, blood, fat, and bones. Domestication to acquire these primary products was realized around 6500–6000 BCE, in the Neolithic period. Eventually, this method of animal exploitation was replaced by various means of obtaining secondary products such as milk, wool, fiber, and the application of animals to provide traction and transportation power. Secondary products can be obtained without slaughter and used repeatedly, as long as the animals are alive. Historical artifacts include reliefs and statues of long-haired sheep in Mesopotamia around 5000 BCE during the Bronze Age; slightly later, around 4000 BCE, there is evidence of animal harrowing and the milking of cattle and sheep. Around 3500 BCE, cuneiform clay tablets record animal husbandry for wool and milk in the Near East, and figures of carts and yoked cattle were excavated in the Near East and Europe. Wool fibers, cattle necks, wooden plows (simple harrows), wooden vehicles, and harrow sites at submerged and buried sites have been found in Eastern, Central, and Northern Europe, dating from around 3000 BCE. In other words, the *Secondary Products Revolution* was a series of simultaneous innovations around 3500 BCE, about 2,000 to 3,000 years after the advent of domestication. Only in Western Asia and Europe archaeological traces of the *Secondary Products Revolution* have been preserved on such a wide scale prior to the Bronze Age (SHERRATT 1981; 1983).<sup>6)</sup>

In other words, the *Secondary Products Revolution* means that the development of a series of techniques related to dairy product utilization, as described above, made it possible for humans to live on the milk of livestock. The continuous acquisition of such dairy products provided stable food resources, allowing humans to move into the vast grasslands, stay there for a long time, and lead a nomadic life.

### 2-2 **Evolutions in the Steppe Pastoralist Economy From the 4<sup>th</sup> to the 2<sup>nd</sup> Millennia BCE**

Four pastoral economic models of the Eurasian steppe have been proposed regarding the 3,000 years before and after 3500 BCE. This very attractive classification was

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6) However, there has also been criticism of the Secondary Products Revolution, e.g., HELMER and VIGNE (2007); GREENFIELD (2010); MARCINIAK (2011).

**Table 1** Four models of animal husbandry in the Eurasian steppe from the 4<sup>th</sup> to 2<sup>nd</sup> millennia BCE

1 Minusinsk steppe model	<b>Afanashevo, Okunev Cultures:</b> Cattle (cattle-breeding); Fur-bearing animal hunting; Perhaps people were not fully settled.
2 Volga-Ural steppe model	<b>Yamnaya Culture:</b> Small cattle (sheep-breeding); Pastoral economy (seasonal pasturing).
3 North Caucasus model	<b>Maykop Culture:</b> Cattle, pigs; Settled cattle and pig breeding; Perhaps vertical transhumance.
4 North Pontic steppe model	<b>a) Sredny Stog II (Repin, Deleifka)</b> Horse breeding; Settled life (North of steppe and forest-steppe). <b>b) Mikhailovka II and III, and Lieventsovka, etc.</b> Cattle breeding; Settled life (river valley). <b>c) Yamnaya culture:</b> Sheep breeding; Nomadic economy (open steppe regions).

Source: RASSAMAKIN (2006:451). Note that Rassamakin cites Shirov's paper (1975) as the source, but the author of this paper has not yet confirmed it.

expounded by Yuri Rassamakin based on Shirov's 1975 paper (RASSAMAKIN 2006: 451).

According to Rassamakin, in chronological order of occurrence, the first of Shirov's four models of animal husbandry in the Eurasian steppe is Sredny Stog II culture (ca. 4000–3500 BCE), a horse-breeding steppe economy, that settled in the northern region of the steppe and in the forest steppe. Sredny Stog II culture is notable for being kept by sedentary people, although it does not seem to have included mass sheep husbandry. Before the end of Sredny Stog II culture in 3500 BCE, a series of innovations (horseback riding, wheeled carts, etc.) were underway, in addition to the development of dairy products, as mentioned in connection with the *Secondary Products Revolution*; moreover, their range of activity extended deep into the steppes' interior. Consequently, they were able to expand their pastoral activities as nomads into the open steppe areas.

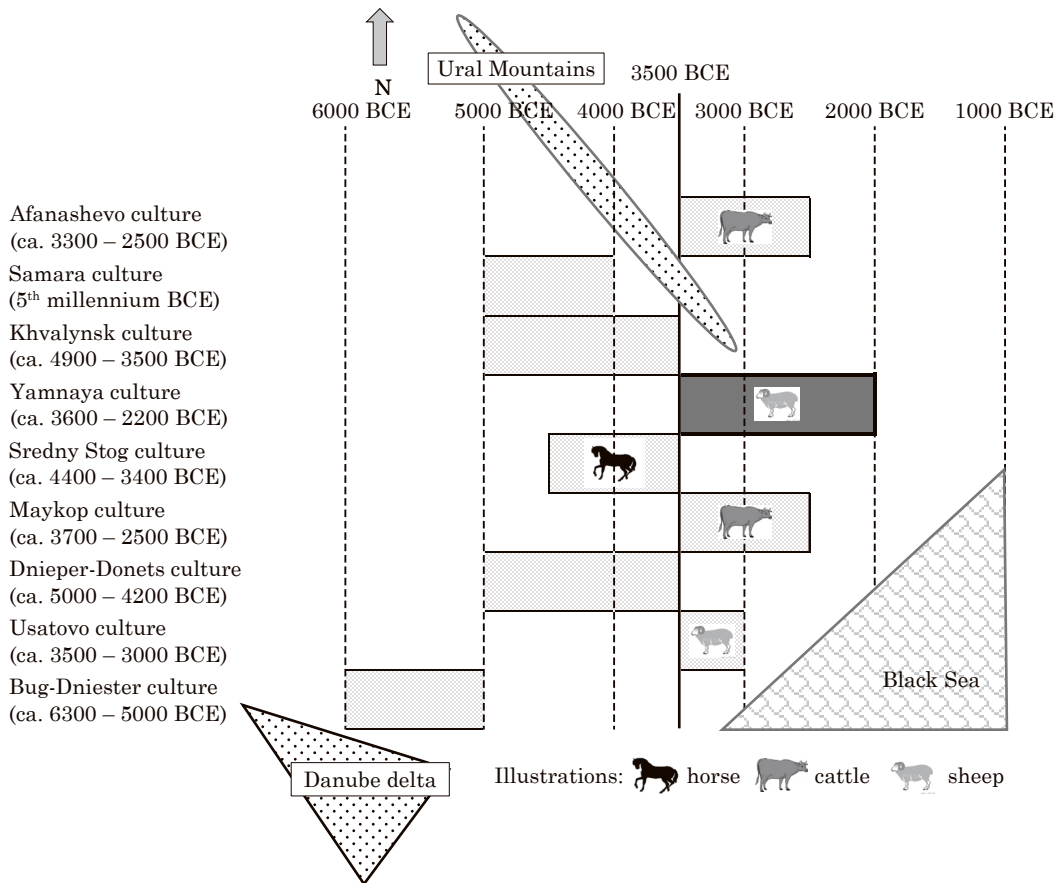
After Sredny Stog II culture, Maykop culture (ca. 3700–2500 BCE) was established as the second model of the steppe economy. It involved the rearing of cattle and pigs, and the people lived a sedentary life as agro-pastoralists. Next, as full-fledged Proto-Indo-Europeans, Yamnaya culture (ca. 3600–2200 BCE) emerged as the third model, notably situated in the vast steppe area between the Volga River and the Ural Mountains, where the people herded sheep. Afanashevo culture (ca. 3300–2500 BCE) was established as the fourth model, with a cattle-breeding economy in the Minusinsk Basin.

### 2-3 Implications of Yamnaya Culture

The implications of Yamnaya culture as a stage in the full-scale development of Proto-Indo-Europeans are illustrated in Figure 1. In this figure, I aim to illustrate the development of pastoral cultures in the Pontic-Caspian steppe between the Danube delta and the Ural Mountains during the 5,000 years from the 6<sup>th</sup> to 2<sup>nd</sup> millennia BCE. The animal illustrations in the figure represent the category of animals most symbolic of each culture, and the direction sign indicates each culture's approximate geographic position from southwest to northeast.

In the cultures before the 3500 BCE divide, such as Bug-Dniester culture (ca. 6300–5000

**Figure 1** The Development of Nomadic Pastoralist Cultures in the Pontic-Caspian Steppe: The Divide of 3500 BCE



Note: Created by the author from various materials relying, among others, on ANTHONY 2007; MALLORY 1989; RASSAMAKIN 2006. The approximate chronology of each culture and the direction sign (N) show the approximate geographical layout of each culture. The livestock illustrations in the figure show typical livestock (horses, cattle, and sheep) in each culture. The Sredny Stog culture, characterised by horse breeding, was the starting point of the further development of the steppes. After the divide around 3500 BCE, sheep breeding and nomadic pastoralism have developed in a wide range of steppes and laid the foundation for the establishment of Yamnaya culture (highlighted).

BCE), hunter-gatherers practiced parttime cultivation of cereal, beans, and legumes, as well as livestock rearing, in addition to hunting and gathering. Although the tendency toward sedentarization seems to have increased, the culture was semi-sedentary, and a mobile lifestyle was maintained. In contrast, from 3500 BCE onward, a series of full-fledged pastoral economic cultures arising from the Yamnaya, Maykop, Usatovo, and Afanashevo cultures were aligned. The nodal point among them is Sredny Stog culture (ca. 4400–3400 BCE), which was based in relatively small areas such as river margins, with the spread of the culture as a whole also covering a relatively small area. It was characterized by the domestication of horses and horseback riding. By the end of Sredny Stog culture, around 3500 BCE, there was a major economic transformation as innovations emerged in successive clusters and were applied to life on the steppes.

Wool sheep and wheeled wagons greatly increased mobility,<sup>7)</sup> and the *Secondary Products Revolution* provided continuous access to processed milk products. These innovations allowed single families to rear large herds of livestock in the vast steppe areas. The result was a highly commercial nomadic pastoralist culture that raised large flocks of sheep and shipped them to the densely populated areas of distant Mesopotamia. If Shirov’s model of the steppes economy is correct, then Sredny Stog II culture may have been the origin of the nomadic economies of the subsequent steppe economies, leading to the formation of Proto-Indo-European cultures such as the Yamnaya culture.<sup>8)</sup>

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7) According to Anthony (2007:461), the pastoral economy expanded with the development of wagons (wheeled carts) around 3300 BCE. Antecedently, Yamnaya pastoralists’ range of movement was 50 km per year, but the combination of wagons that could carry large loads of goods and riding, which facilitated swift movement, quickly led to significant development of the steppes. As the speakers of Indo-European languages moved, they sowed the seeds of each of the various languages.

8) According to the Steppe hypothesis, the expansion of the Yamnaya cultural horizon on the northern part of the Pontic-Caspian steppe was embodied in the construction of Late Proto-Indo-Europeans. Before 4000 BCE (and probably before 3500 BCE), neither wool products nor wheeled carts existed. However, after 3500 BCE, Proto-Indo-Europeans commonly spoke of wheeled vehicles and wool fibers. This suggests that the Proto-Indo-European language was first spoken between 4000 BCE and 3500 BCE (ANTHONY 2007: 59). The full-scale formation of Proto-Indo-Europeans in the first half of the 4<sup>th</sup> millennium BCE, i.e., before the “divide of 3500 BCE” mentioned in this paper, seems to be reasonable. The mass migration of Yamnaya people to central and northern Europe in the Early Bronze Age has also been confirmed in genetic studies conducted by HAAK et al. (2015) and ALLENTOFT et al. (2015), as well as JURA et al. (2018), with slightly different opinions. However, in recent years, there have been criticisms from Klejn, resulting in very interesting discussions (KLEJN et al. 2018).



### 3. Originality of the Nomadic Initiative in the Pontic-Caspian Steppe

#### 3-1 Schumpeter's Typology of Five Innovations

Joseph Schumpeter (1883–1950), in his *The Theory of Economic Development* (originally published in 1912), referred to what are now called innovations as *new combinations*. According to him, production is the combination of various things and forces that are available to us. A change in the product and the method of production involved a change in the combination of these things and forces, and *new combinations* were nothing but changes in the combination of things and forces that economic agents carry out discontinuously. As Schumpeter thought that *new combinations* only appeared discontinuously, the *new combinations* should not be reached by continuous and progressive adaptation from the old combination through smaller steps. According to him, the phenomenon peculiar to development was established as long as it appeared discontinuously. In other words, Schumpeter's idea of economic development was to change the economy from one in which change occurred insofar as it adapted to the external environment to one in which change was created by the economy itself (SCHUMPETER 1983: 57–94).

According to Schumpeter, *new combinations*, i.e., innovations, can be classified into five categories:

Development in our sense is then defined by the carrying out of new combinations.

This concept covers the following five cases: (1) The introduction of a new good — that is one with which consumers are not yet familiar — or of a new quality of a good. (2) The introduction of a new method of production, that is one not yet tested by experience in the branch of manufacture concerned, which need by no means be founded upon a discovery scientifically new, and can also exist in a new way of handling a commodity commercially. (3) The opening of a new market, that is a market into which the particular branch of manufacture of the country in question has not previously entered, whether or not this market has existed before. (4) The conquest of a new source of supply of raw materials or half-manufactured goods, again irrespective of whether this source already exists or whether it has first to be created. (5) The carrying out of the new organisation of any industry, like the creation of a monopoly position (for example through trustification) or the breaking up of a monopoly position. (SCHUMPETER 1983: 66)

In the context of the argument put forward in this paper, I will discuss the relevant innovations in the following order:

- 1) A new market

**Table 2** Five Innovations Related to Nomadic Pastoralism Around the Divide of 3500 BCE

Categories	Innovations
New market	Urban settlements in lower Mesopotamia
New product	Wool
New production method	Nomadic herding in vast depopulated areas
New resource	Wool sheep
New organization	Autonomous entity composed of humans and animals

Source: Author

- 2) A new product
- 3) A new production method
- 4) A new resource
- 5) A new organization

Around 3500 BCE, Sredny Stog culture ended and Yamnaya culture, i.e., a representative of Late Proto-Indo-European cultures, was formed. In approximately the middle of the 4<sup>th</sup> millennium BCE, a series of major innovations of which Proto-Indo-Europeans made use occurred in clusters.

### **3-2 Five Innovations Made Use of by Proto-Indo-Europeans in the Mid-4<sup>th</sup> Millennium BCE**

- (1) A new market: Urban settlements in lower Mesopotamia

Irrigated agriculture began in the Mesopotamian alluvial plain around 5000 BCE, and its development led to population concentration. In the 3<sup>rd</sup> and 4<sup>th</sup> periods of Ubaid culture (ca. 4500 – 4000 BCE), densely populated settlements of several hundred people were formed throughout the lower Tigris and Euphrates, and population concentration accelerated until about 3500 BCE. The first eight city-states emerged around 3000 BCE, including Ur, Uruk, and Lagash. Due to the emergence of urban settlements in lower Mesopotamia, a new market was created (JACOBSEN and ADAMS 1958; ADAMS 1974; PAULETTE 2013).

The huge cities (for their time) that appeared only 2,000 years after the advent of irrigated agriculture produced an abundance of barley and wheat. However, since the cities had sprung up out of thin air in the middle of a vast desert, there were almost nothing for the procurement of basic commodities and materials except for water and mud. As for the food, clothing, and housing, which were necessities, people could manage with large quantities of cereal (barley and wheat), beans, livestock, and river fish, but for shelter, even if they used plenty of sun-dried mud bricks, they needed large quantities of wood to build structures, furniture, and tools. A large amount of wood was imported from the Lebanese cedar forests that existed at the time. Furthermore, the demand for wool, as well as linen, for clothing grew rapidly. The early Mesopotamian city-states depended on

the import of large quantities of goods from neighboring and distant regions to sustain their huge populations.<sup>9)</sup>

Trade between the Mesopotamian urban civilization in the south and the steppe nomads in the north began around 3700–3500 BCE. At this time, the steppe nomads introduced the wheeled wagon from Mesopotamia via the Maykop culture (in the northern foothills of the Caucasus Mountains). In return, they exported wool, probably in exchange. However, while the trade was not very active, wagons (then driven by oxen) were extremely useful for transportation. Between 2300 BCE and 2000 BCE, from the Akkadian Dynasty to the Third Dynasty of Ur, the demand for raw materials such as metals, jewelry, wood, and leather products, as well as livestock and slaves, increased dramatically in the cities of Mesopotamia. The nomads on the steppes responded, and eventually, by 1500 BCE, the Mitanni (Indo-European-speaking peoples) invaded Anatolia and became the rulers (ANTHONY 2007: 264; 282; 412).<sup>10)</sup>

As urban agglomerations in the Mesopotamian alluvial plain began to grow and large population concentrations spread out, the demand for clothing increased rapidly. The innovation was market-oriented, as evidenced by the rapid growth in demand for wool products.<sup>11)</sup>

## (2) A new product: Wool

In prehistoric West Asia and the Old Continent, flax and wool were the main sources of fiber. The earliest evidence for the use of flax as fiber dates back to the 7<sup>th</sup> millennium BCE (the Pre-Pottery Neolithic Age), and from then until the 3<sup>rd</sup> millennium BCE, it was a major source of fiber in West Asia. However, using flax as fiber is very labor-intensive.

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9) The ancient Mesopotamian civilization, which emerged on the alluvial plains of the subtropical region, was extremely resource-intensive and devastating. “The most widely accepted archaeological cases of overshoot and collapse were proposed by Jacobsen & Adams (1958; Adams 1981). In ancient southern Mesopotamia, intensive irrigation could produce growing prosperity. The Third Dynasty of Ur (ca. 2100 to 2000 b.c.) expanded the irrigation system and encouraged growth of population and settlement. It established a bureaucracy to collect taxes and tribute. Unfortunately, after a few years of overirrigating, saline groundwaters rose and destroyed the basis of agricultural productivity. The political system lost its resource base and was destabilized. Large irrigation systems that required central management were useless once the state could not maintain them.” (TAINER 2006: 61)

10) The rapid increase in Central Asia copper demand from the early Sintashta culture in 2100–2000 BCE caused major societal changes on the northern steppes. The demand from Mesopotamian cities provoked a boom in metal production on the steppes after 2100 BCE (ANTHONY 2007: 435).

11) At the same time (3300–3200 BCE), the Cycladic voyagers (Grotta-Pelos) developed a culture of multi-oared ships. Nomadic sheep shepherds of the steppe probably met them on the Black Sea coast. In other words, exchanges and mutual influence between the steppe and the sea across the Black Sea emerged presumably after 3500 BCE (ANTHONY 2007: 336).

Compared to processing flax, making wool into fiber requires less time and effort, and wool is also easy to dye. Flax may thus have been more expensive than wool because of the larger time and effort required. For these reasons, wool was more heavily used than flax among urban residents. Evidence for the use of wool is uncertain until the 5<sup>th</sup> millennium BCE,<sup>12)</sup> but woolen textiles certainly existed in Europe after 3300 BCE. The use of wool became important from the 5<sup>th</sup> millennium BCE, but results of analysis of animal bones and other remains at archaeological sites indicate that the use of wool became more prevalent in the 4<sup>th</sup> millennium BCE. In Mesopotamia and western Iran, wool was preferred to linen and was broadly used because of its ease of dyeing (ANTHONY 2007: 60–63).

(3) A new production method: Nomadic herding in vast depopulated areas

To raise a large number of livestock and produce wool as a commodity, it was beneficial to expand into sparsely populated areas, just as with slash-and-burn agriculture. Therefore, Proto-Indo-Europeans, who were half farmers and half pastoralists, actively moved into the steppes and started practicing nomadic pastoralism there. The steppes between the great rivers, which had previously been undeveloped, were suitable for this. In the Early Bronze Age, the people grazed their animals in the uncultivated areas around the steppes, but later, when wagons (wheeled carts) were in regular use, they were able to enter the vast steppes with their daily necessities. Thus, as nomadic pastoralism on the steppes flourished, the commodity economy developed, and the accumulation of wealth on the steppes advanced in the Middle Bronze Age (ANTHONY 2007: 300–339).

A particular set of innovations made nomadic pastoralism workable on the steppes. Basically, these are (1) horseback riding, (2) the spread of wheeled carts, and (3) the development of processed milk and products.

First, horseback riding contributed to enhancing the management of livestock herds. Humans were already riding cattle and onagers in West Asia (DOWNS 1961). The people of the Eurasian Steppe learned the practice in West Asia and applied it to horses. Similarly, animal-drawn carts (driven by oxen and onagers) were being utilized in West Asia, and

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12) “In sum, various forms of evidence for wool production can be documented a short time after the fifth millennium B.C. [...] Thus we can suggest that the Chalcolithic period must have been a critical point for the development of wool production, although it is possible that wool was used to some extent during earlier stages of animal domestication. At present it is most probable that wool production started to become more intensive after the Chalcolithic period. On the basis of analogies with later periods, Algaze (1993) has suggested that woollen textiles may have been an important export from southern Mesopotamia to the north during the Uruk expansion of the fourth millennium B.C. In light of these arguments, it is worth examining the evidence for developments relating to wool production during the preceding Ubaid period.” (SUDO 2010: 170)

the steppe people applied this practice to horses. In this way, the wheeled wagon, which was originally developed in West Asia, was transmitted to the steppes, where it was combined with horses and used on a large scale by the steppe people, probably Proto-Indo-Europeans (ANTHONY et al. 1991; DUCHESNE 2009). Horseback riding likely started in the Pontic-Caspian steppe before 4200 BCE because it was essential for the management of herds of domesticated horses. The spread of horses outside the Pontic-Caspian steppe probably occurred between 3700 BCE and 3000 BCE. The domestication of horses and the advent of horseback riding significantly impacted nomadic pastoralism because it allowed mounted herders to move quickly with their herds. In terms of pastoral management technology, a notable innovation was the use of horses to manage large herds of gregarious grazers (sheep, cattle, horses, etc.) (ANTHONY 2007: 221-222).

Second, just as riding began in Mesopotamia on oxen and onagers and was subsequently applied to horses on the steppes, wheeled carts were developed in Mesopotamia, then they spread to the steppes and were eventually pulled by horses. Wheeled carts probably spread from Mesopotamia to the steppes via the Late Maykop culture (ANTHONY 2007:63).<sup>13)</sup> It is unclear when wheeled carts first appeared on the steppes. The earliest excavated wheeled carts date to 3100-3000 BCE and probably began to be used about 200 years earlier, before Yamnaya culture began. However, the organization of the nomadic form of pastoralism with wheeled carts took a long time, and such nomadic pastoralism was established in Yamnaya culture (ANTHONY 2007:312).

Third, the development of milk processing gave people the means to preserve easily perishable milk for a relatively long time, which, in turn, facilitated prolonged nomadic pastoralism in the arid steppe regions, without any unnecessary livestock casualties (ITAN et al. 2009; LEONARDI et al. 2012).

#### (4) A new resource: Wool sheep

The wool industry developed on a large scale in Europe in the Bronze Age;<sup>14)</sup> the introduction and presence of wool sheep in Europe presumably happened much earlier. According to Anthony, sheep for wool appeared at the end of Sredny Stog culture. The appearance of long-wool sheep in the Middle East occurred after 3400 BCE. The genetic change that precipitated the shift from the use of sheep for food to their use for wool may

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13) The wheel (without spokes) in Mesopotamia was brought to the steppes through the Maykop culture (ANTHONY 2007: 295).

14) Sabatini and his colleagues state, relying on recent studies that “the introduction of wool and of woollen textile production represented in all likelihood a major innovation in Bronze Age Europe during the 2nd millennium BCE. Wool was clearly becoming increasingly appreciated and widespread in Europe.[...] woollen textiles came into use across continental Europe at the onset of the second millennium BCE [...], and also that a local production emerged at some sites throughout the following centuries” (SABATINI et al. 2019: 4909-4910).

have occurred in Europe, where it is colder, but the breeding of sheep for wool in Europe may have coincided with the same practice in the Middle East. The slaughter of sheep for wool leaves characteristic marks; however, there is no archaeological sign of it before the Late Uruk period (3350 BCE) (ANTHONY 2007: 61-62).<sup>15)</sup>

The widespread use of wheeled wagons on the steppes in 3400-3000 BCE occurred just about the same time that wool sheep began to be deffused on the steppe (ANTHONY 2007: 66). Wheeled wagons were pulled by horses as well as oxen on the steppes, but wagon-pulling likely required well-trained oxen. By ca. 3600-3200 BCE, wool sheep had spread to the middle Danube, Austria, Moravia, and the Aegean coast. The sheep in these areas were kept for wool, and by ca. 3600 BCE, horses, wool sheep, and wool were commonly seen in Eastern Europe. After that, they expanded rapidly in Eastern Europe (ANTHONY 2007: 261-262).

In Usatovo culture (3500-2500 BCE), which formed in the region spanning the Dniester to the lower Danube basin, large numbers of sheep were reared, and spinning and weaving flourished on the plateau in the middle Dnieper and Dniester basin. Weavers on the plateau wove sheep's wool sourced from the steppes. In Usatovo, the horse played a very important role in riding and commodity (ANTHONY 2007:351). Around 3500-3000 BCE, the Don Volga River-Kazakh steppes became colder and drier, but by 3300-3100 BCE, it was common to see wagons with large flocks of wool sheep crossing the steppes, making a creaking noise (ANTHONY 2007: 300).

The discussions about wool sheep that Anthony and others elaborated are highly suggestive. Proto-Indo-Europeans first began to breed wool sheep in large flocks around 4000 BCE. This led to those peoples' self-formation. Moreover, the purpose of raising wool sheep was, from the outset, to sell the product, i.e. to produce them as a commodity. If the purpose of herding was subsistence, the people should have wanted milk, in which case, they would have chosen goats. Regarding Proto-Indo-Europeans' self-formation, the people kept sheep, and then they kept cattle (or goats) in their settlements as food sources, which supplied them with plenty of milk (cf. ANTHONY 2007: 36; 327).

#### (5) A new organization: An autonomous entity composed of humans and animals

The human-animal organization the nomadic pastoralists constructed was unprecedented in the history of human organization in a threefold sense.

First, in nomadic pastoralism, each shepherd family with their herd appeared to be

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15) M.-L. Pipes (PIPES 2014: 16-26) argued for the introduction and presence of "wool-bearing sheep" in Europe in the later Neolithic, stating that "wool production starts to become an important economic product during the mid-4th millennium BCE. [...] sheep intensification documented in some Funnel Beaker faunal assemblages from southeastern Poland dating to 3650-3100 BCE occurred in conjunction with the development of a wool economy." (PIPES et al. 2014: 80)

acting physically separate and isolated from other families, in the grasslands. Owing to the development of horseback riding and wagons, single families apart from agglomerated villages became viable. After ca. 3500 BCE, the population dispersed across the steppes. Large-scale livestock rearing on the steppes (which had previously been an economically worthless endeavor) led to the accumulation of wealth. The people, who, previously, could only live in hardened groups, were now able to live scattered across the steppes. Sparse positioning made it possible for shepherds to raise large numbers of sheep effectively; however, this setup also introduced an element of danger. Seeking more safety, the people purposefully strove to form human-to-human ties with other families, build close alliances, and expand their organization from clans to tribes; mutually acceptable agreements between clans were also a feature of Yamnaya culture. The effective way to do this was, of course, an alliance based on the kinship principle; however, alliances between strangers based on the patron-client relationship were also established simultaneously, albeit secondarily. The secret to the development of Sredny Stog culture in a relatively small area compared to the vast steppes was the formation of mutually understood social norms and mechanisms for living on the steppes; forming a series of strategic social relationships was also an effective practice in the establishment of the Late Proto-Indo-Europeans (ANTHONY 2007: 72-73; 300-339).

Second, while the shepherd and his family were, of course, humans, they were accompanied by several hundred domestic animals (e.g., sheep). Humans have long subsisted by hunting and gathering, which obliged them to live in small groups called bands due to the scarcity of subsistence. When dogs began accompanying humans, they were merely auxiliaries, even if very useful and beneficial for hunting. In settled societies, sedentary farmers often raised livestock. Livestock herding, however, was a secondary means of production, so animals were not indispensable to community continuity. In contrast, in nomadic pastoralism, shepherds were individually and autonomously mobile on the steppes with their herds. If we regard the shepherd with his herd as a single unit, this unit comprised humans and non-human animals, in clear contrast to sedentary societies. Non-human animals were integrated as essential members of the organization made up of shepherds and livestock. Although there were sedentary farmers without herds, there were no nomadic pastoralists without herds.

Since their emergence, humans have organized according to the ties-based principle for almost their entire existence, i.e., about seven million years. The nomadic pastoralists' entities composed of shepherds and flocks were the first organizations to include heterogeneous members (non-human animals, e.g. sheep and dogs) without transforming them into homogeneous members. This is because sheep and dogs will never be human, no matter what happens. In these organizations, it was no longer necessary to devote time and care to animals to taming them and thereby converting outsiders into insiders. On the contrary, in the organization nomadic pastoralists created, non-human beings

were integrated based on their functions: i.e., sheep for the supply of resources and dogs for herd-control assistance. If you are convinced that strangers from other ethnic groups and tribes are livestock, just like sheep, you would derive a mechanism to integrate strangers as outsiders based on their functions. This is the very moment in human history when a new principle (which I call the function-oriented principle), one entirely opposite to the ties-based principle, was generated (NAKAGAWA 2021b).

Third, the peculiarity of the Proto-Indo-European organization lies in its three-tiered structure, which was in sharp contrast with other pastoralist tribes having a two-tiered structure. Proto-Indo-Europeans organized themselves into entities having distinctive characteristics (for the time): shepherd → dogs → herd of sheep. In this entity consisting of humans and non-humans, the *mediators*, so to speak, were dogs, which sustained the organization through the use of violence. To perform the function of managing livestock herds using violence, which humans were incapable of doing, shepherds focused on the ability of dogs as “predators of sheep” and recruited the animals from outside human markets as *mediators*. Here, we can see the conception of the function-oriented principle, in which the function is determined first, and then whoever is the most suitable for the job is appointed to fulfill that function (NAKAGAWA 2021a).

Above all, these people were able to see the peculiarity of their own early nomadic organization in contrast to the ties-based principle that had been the basic and single organizational principle up to that time. They devised the function-oriented principle as something else entirely different from the ties-based principle and elaborated their worldview as an ideology, i.e., a system of ideas about society commonly shared with community members. Their belief, the *trifunctional ideology*, is a shared belief about the origins of the world: “The world is made up of three classes, and we, as sovereigns, rule and control the whole of it.” As an ideology, this shared belief was applied to reality.<sup>16)</sup>

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16) Georges Dumézil advocated the “trifunctional ideology” after his exhaustive study of Indo-European mythology, which was a reflection of the function-based principle that they acquired from this unique organization. The belief that they should hold the sovereignty in the construction of organizations became a collective conception of the world, i.e. a conception shared by the tribal people collectively as an ideology. As a result of the acquisition of such a principle of organizational integration, when they left the steppes and came into contact with other tribes and peoples who were settled agricultural people in the vicinity, they might have been quiet and friendly in ordinary times. However, when they saw an opportunity to conquer them and establish a system of rule, they treated the conquered settlers as livestock, so to speak, and organized themselves to become shepherds (that is, they assumed the position of the sovereign), and it was quite natural for them to establish a system of rule.



## Conclusion: Nomadic Pastoralist Attributes Engraved in the Present-day Society

When Proto-Indo-Europeans began to engage in nomadic pastoralism in the 4<sup>th</sup> millennium BCE, they were neither cornered nor forced to flee to the steppes. While practicing parttime cultivation on several sedentary bases, they could make a living, as long as they worked as hunters and gatherers, occasionally going out to the steppes to hunt small animals, catch fish in the river, or gather nuts and fruits in the forest. There was scarcely any need for them to go out and to engage in nomadic herding, which was a painful and dangerous activity on the steppes due to the scarcity of food and water; indeed, the environmental conditions on the steppes were worse than those where they had lived before, such as near rivers. Therefore, they deliberately pursued an “entrepreneurial” activity; they “newly combined” several innovations, took risks, and boldly entered new business areas.

The development of urban settlements in Mesopotamia led to an increase in the urban population and a growing demand for textiles such as clothing and bed linen, etc., and it made sense to raise large numbers of wool sheep to supply the cities with wool to meet this new demand. Raising sheep in large numbers in a vast, sparsely populated area such as the steppes was a highly rational choice of management of their environment. Proto-Indo-European tribes later found their way to the steppes, and by 3200 BCE, nomadic herding of sheep had become a reality. Their decision to raise large numbers of sheep on the steppes was groundbreaking in terms of both technology and management. They raised sheep, not for food, but rather to produce wool as a commodity and sell it to the cities in the south.

In our inquiry regarding the historical origin, it was not only Proto-Indo-Europeans who led a nomadic life in prehistoric times; nomads from various other ethnic groups also carried on nomadic pastoralism, such as the Semitic and Turkic, among others. Unlike the sedentary people engaged in irrigated agriculture in the alluvial plains of Mesopotamia, the nomads were the first in history to live nomadically away from sedentarism, and to that extent, they were detached from nature and had a rational way of thinking (GADGIL and GUHA 1992:25). It was in nomadism that the function-oriented principle had its genesis. Why, then, did Indo-Europeans come to hold hegemony of the world instead of other nomadic peoples?

I can briefly cite the following reasons for the Indo-Europeans’ successful conquest. First, geographically, they were the nearest among the nomads in the Eurasian Steppe to the principal grain cultivation areas; second, they succeeded at horse domestication; third, to accumulate wealth, they engaged in the mass rearing of wool sheep; fourth, they executed the first nomadic invasion and succeeded in establishing their reign over the

surrounding agricultural regions. Among others, it should be pointed out that the human-animal entity the nomadic pastoralists constructed set the basis of the function-oriented principle and then created a foundation for an artificially constructed organization called society.

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