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Introduction

Hello, and welcome to the October 2009 issue of DNA Tribes® Digest. This month, we will look at individual populations near the Hindu Kush mountain range, where migrating Indo-European speaking peoples came in contact with the older Indus Valley Civilization.

This issue features the first of several articles to explore genetic relationships in parts of the world with complex histories using an analysis of basic genetic contributions, complementing DNA Tribes®' more locally specific inter-region genetic analysis in this part of the world¹. The current issue's more basic analysis will allow us to identify large scale patterns of gene flow in Eurasia behind more local relationships between regions. This is particularly important near Central Asia, which has a long and complex population history that genetic data are just beginning to illuminate.

This article will also expand on the relationship between the Indo-European (IE) speaking populations of Europe and in Asia. The history of the Asian IE cultures remains a less explored subject of European history. However, genetic data indicate that the modern day similarities between European IE languages such as English and Asian IE languages such as Persian are not merely coincidental, but instead reflect expansions of European populations into Asia, producing new societies combining European and Asian cultures.

Best regards and I hope to speak with you soon,
Lucas Martin
DNA Tribes

¹ Available in the December 2008 Digest issue at <http://dnatribes.com/dnatribes-digest-2008-12-26.pdf>

Refuge of Sages and Outlaws: Basic Genetic Contributions near the Hindu Kush

Background: Home of the tallest points on Earth, the Himalayas are a massive chain of mountain ranges formed when the Indian Subcontinent collided with the Eurasian landmass circa 50 million years ago. The Himalayas are divided into several local ranges, and the westernmost of these ranges is the Hindu Kush in present day Pakistan and Afghanistan. From earliest antiquity², the rugged lands of the Hindu Kush have been known as a refuge for both holy sages and fierce warriors.

It was through these mountain passes that roaming peoples who called themselves *Arya* (“Nobles”³) and spoke European-like languages are thought to have entered the Indian Subcontinent. The origins of these Indo-Aryan cultures are unknown, but they are thought to have emerged from early Indo-Iranian cultures: either the nomadic Andronovo culture of the Eurasian steppe or else the agricultural BMAC⁴ culture along the Oxus River (see **Figure 1**).

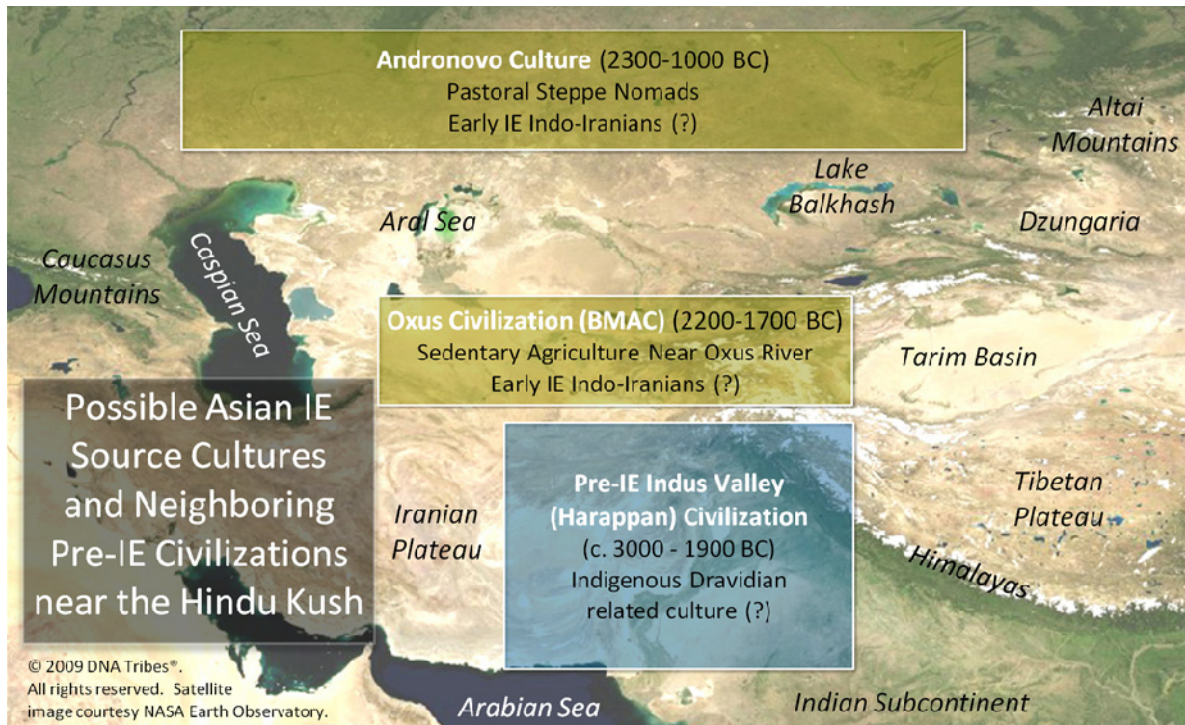


Figure 1: Possible Asian Indo-European (IE) source cultures and the pre-IE Indus Valley Civilization.

² Evidence of hominid presence here dates to the Stone Age Soanian culture associated with *Homo erectus*, during a period when the Acheulean culture was active in Europe. However, these early Eurasian *Homo erectus* populations probably did not leave descendants among modern humans according to current models of human origins (which are disputed by advocates of the alternative multiregional model of human evolution).

³ Despite later uses by Europeans, the ethnonym “Aryan” is specific to cultures of India and Iran. This name describes the Vedic and Iranian peoples and is not known to have been used anywhere in ancient Europe. The word “Aryan” is used to the present day in cultures of India and is also the root of the modern nation name “Iran.”

⁴ BMAC is an abbreviation for Bactria–Margiana Archaeological Complex.

These incoming Indo-Aryans encountered and conquered⁵ the urban Indus Valley civilization in present day Pakistan, which perhaps was related to early Dravidian cultures of India and the Elamite civilization of the Iranian Plateau (see **Figure 1**). This Indo-Aryan conquest of the Indus Valley culture created a new Vedic civilization that synthesized both cultures (see **Figure 2**). This Vedic civilization recorded some of the earliest texts written in any Indo-European language, known as the *Rigveda*. The Rigvedic texts open with a hymn to *Agni* (a fire deity) and are said to have been composed by sages known as *Rishis*⁶.

However, these migrations were not a onetime event. Since the Indo-Aryan invasions, many waves of Indo-European cultures have emerged in the craggy Hindu Kush and nearby northern India, some living in independent societies and some establishing themselves as conquerors. **Figure 2** illustrates just a sampling of these mountain peoples along with neighboring IE cultures of Central Asia. Although they were better known to the ancient Greeks, these Asian IE cultures have been viewed as exotica in modern Western discourse. This is in part because during the medieval period, these Asian IE territories were conquered by the expansion of Mongolic and Turkic cultures and thus separated from the European world.



Figure 2: Later Asian Indo-European (IE) cultures of the Hindu Kush and neighboring IE cultures of Central Asia.

⁵ The Indus Valley Civilization was already in a state of decline at the time of the Indo-Aryan conquest. One possibility is that a period of climate change disrupted lifeways in this part of the world, prompting the decline and abandonment of Indus Valley cities and the invasions of the Indo-Aryans.

⁶ Vedic tradition mentions a group of *rishis* known as the *Saptarshi* (Seven Sages) associated with the Big Dipper constellation and reminiscent of the later Greek tradition of the *Hepta Sophoi* (Seven Sages).

This new IE Vedic culture spread through northern and central India and established a cultural zone known as the Āryāvarta or “Abode of the Nobles.” Over time, Vedic society solidified into a new Hindu civilization rooted in the Āryāvarta of northern India, and the Hindu Kush became known as a land of non-Vedic *Mleccha* (“barbarians”). Among these neighboring *Mleccha* tribes were early IE peoples: some associated with Iranian peoples to the west and some associated with Tocharian peoples to the north. To name just a few, these early IE peoples included the Rishikas⁷, Tusharas, Kambojas, Khasas⁸, and Sakas.

Among these later non-Vedic *Mleccha* peoples were Bactrian Greek cultures that were settled under Alexander the Great and developed into an influential urban civilization composed of many cities, later controlling neighboring parts of Transoxiana and India. These Greeks were known in India as *Yonas* or *Yavanas* (from the Greek *Jaones* or “Ionians”) and established an Indo-Greek kingdom in the Hindu Kush. These kingdoms introduced Hellenic traditions to a new Greco-Buddhist culture that influenced the development of Buddhism in Asia.

However, these relatively peaceful and commerce oriented Greek cultures were displaced by the more warlike Kushan, part of the Yuezhi military confederation that invaded from the north (possibly related to IE Tocharian cultures of the Tarim Basin) (illustrated in **Figure 2**). These conquering Kushan rulers continued the local development of Greco-Buddhist culture while also integrating Zoroastrian and Hindu Shaivist traditions. These Kushan rulers oversaw the building of the colossal sandstone Buddha statues in Bamyān (destroyed by Taliban in 2001) and the composition of the oldest known Buddhist manuscripts, the Gandhāran Buddhist Texts. Under the Kushans, Gandhara emerged as a center of Buddhist culture and was known as the “Garden of the North.”⁹

Like their predecessors, the Kushans themselves were deposed by the Hephthalites or White Huns, who established their capital in Bamyān (today a center of Hazara culture). The Hephthalites are thought to be the last major wave of IE speaking nomads to expand in Central Asia, but under their rule Turkic titles (such as *Khagan*, “Great Khan”) were used, suggesting possible contacts with early Turkic cultures. During this period, the Gujjar or Gurjar (sometimes thought to be associated with the White Hun military confederation) settled in parts of northern and western India, including the state of Gujarat that bears their name to the present day.

The lands of the Hindu Kush were also known as the birthplace of Padmasambhava, the Brahmin prince from the Swat Valley of northern Pakistan who established Buddhism in Tibet and Bhutan. More recently, a part of the Hindu Kush in northern Afghanistan was known to Muslims as Kafiristan (“Land of the Unbelievers”) because its inhabitants resisted the introduction of Islam until the nineteenth century. After conversion to Islam and abandonment of their traditional ways, Kafiristan was renamed Nuristan, or “Land of Light.” Another tradition that has resisted assimilation to surrounding cultures to the present

⁷ Although the meaning of the ethnonym “Rishika” is unknown, this is also the Sanskrit term for a female *Rishi*.

⁸ There is a long list of phonetically similar ethnonyms and toponyms associated with IE cultures near these mountain territories, such as: Ghazni, Gochar, Gujjar, [Hindu] Kush, Kashgar, Kashmir, Khasa, Kucha, and Kushan. It is worth noting that phonetically similar names also appear associated with later Turkic cultures, among them: Ghuzz, Göçer, Hazara, Kassar, and perhaps Kazakh and Khazar. As discussed in several previous issues of DNA Tribes® Digest (including <http://dnatribes.com/dnatribes-digest-2009-07-29.pdf>, <http://dnatribes.com/dnatribes-digest-2008-11-28.pdf>, and <http://dnatribes.com/dnatribes-digest-2008-12-26.pdf>), historical and genetic evidence suggest longstanding contacts between Indo-European and Turkic peoples in Central Asia, despite the tendency of historians to describe these as mutually exclusive cultural spheres.

⁹ Gandhara was later reduced to ruins by the Persian-Turkic conqueror Mahmud of Ghazni. However, it is sometimes thought that the city of Kandahar was later named for Gandhara.

day is the IE Dardic-speaking Kalash of northern Pakistan, who maintain unique cultural traditions perhaps in part retained from early customs of the Indo-Iranians.

In addition to the Iranian and Indo-Aryan migrations, Muslim populations have also entered and settled these lands. During the expansion of the Umayyad Islamic Caliphate, Muslim *Ghazi* fighters invaded Central Asia and the Hindu Kush by way of Iran, founding Persian speaking settlements that blended with local populations. The migration of Muslim fighters to the Hindu Kush continued as recently as the Soviet-Afghan war in the 1980's, when foreign combatants known as Arab-Afghans¹⁰ entered Afghanistan to oppose the Soviet army.

Today, the largest ethnic group in Afghanistan is the Pashtun, an IE Iranian people known (like the early Indo-Aryans) for their warlike independence and strict tribal code of conduct. Other ethnic groups in Afghanistan include the Iranian speaking Tajiks and the Hazara (Iranian speakers who are thought to be of partly Mongolic or Turkic origins). In Pakistan, both Indo-Aryan speaking cultures (such as Punjabis and Sindhis) and Iranian speaking peoples (such as Pashtun and Baloch) can be found.

Genetic analysis: Basic European, Near Eastern, India, East Asian, American Indian, and Sub-Saharan African genetic contributions were identified for several individual population samples near the Hindu Kush. Results are illustrated in **Figure 3** and summarized in **Table 1**.

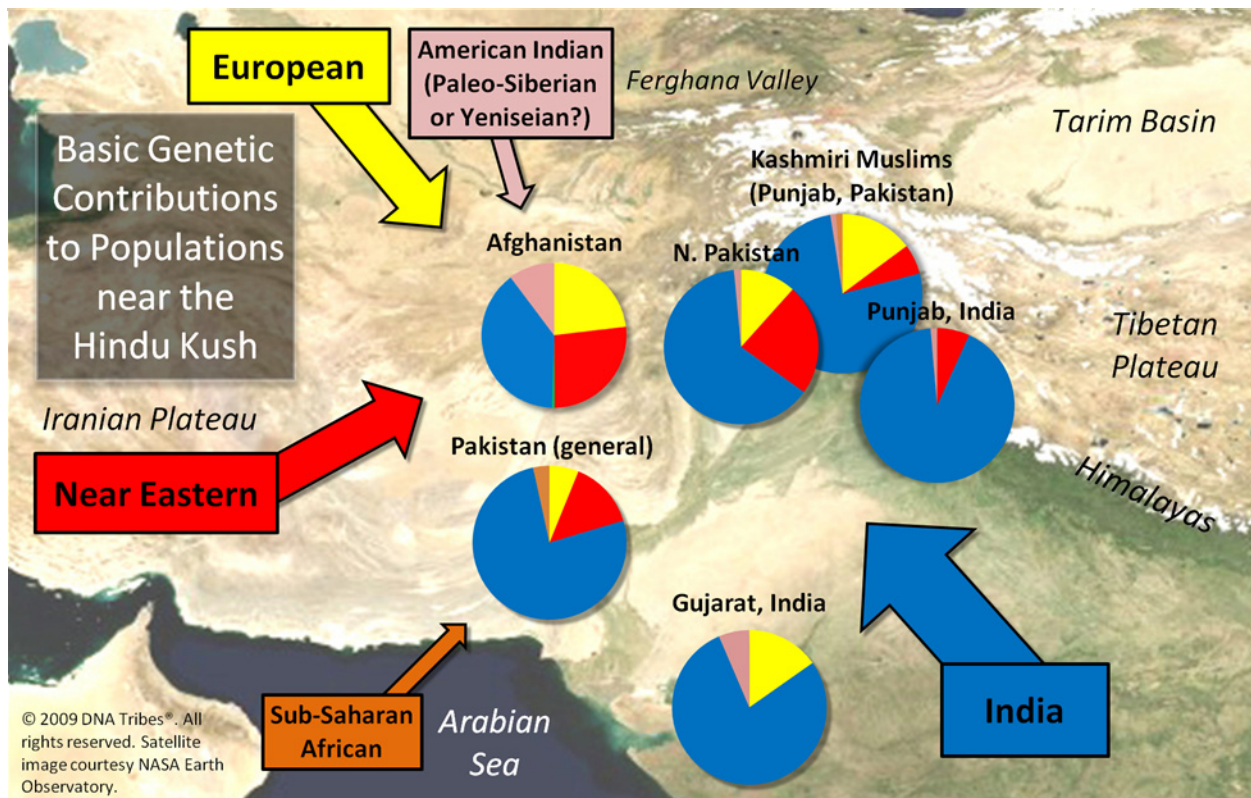


Figure 3: Basic genetic contributions to populations near the Hindu Kush.

¹⁰ Despite the name Arab-Afghan, these Muslim combatants (also known as *Mujahidin* or Jihadists) came from diverse national origins. Although these fighters did include some ethnic Arabs, their identification as Arab also reflects the privileged or elite status of the Arabic language and Arab ethnicity in Islamic society.

Population	India	European	Near Eastern	Amer. Ind.	Sub-Sah. Afr.	East Asian
Afghanistan	39.3%	23.1%	26.8%	10.2%	-	0.6%
Gujarat, India	78.3%	15.2%	-	6.4%	-	-
Kashmiri Muslims	76.6%	14.8%	6.1%	1.1%	1.3%	-
Northern Pakistan	63.6%	11.6%	23.3%	1.5%	-	-
Pakistan (general)	76.2%	6.1%	14.2%	-	3.4%	-
Punjab, India	91.8%	-	6.8%	1.4%	-	-

Table 1: Basic genetic contributions to populations near the Hindu Kush.

Discussion: Results in **Table 1** indicated that the largest basic genetic contribution in all studied Hindu Kush populations was from India, peaking at 91.8% in Punjab, India and achieving a minimum of 39.3% in Afghanistan. This is consistent with substantial continuity with indigenous populations of India (possibly including Dravidian related Indus Valley populations predating Indo-Aryan invasions), as well as later contacts among local Indo-Aryan and Iranian peoples.

Results also indicated substantial European contributions in most studied populations: these were highest in Afghanistan (23.1%), and were between 6.1% and 15.2% in all other studied populations except Punjab, India (where no European contribution was identified). This is consistent with gene flow from European populations associated with Indo-European expansions in Asia¹¹.

A third substantial component identified for most surveyed populations was Near Eastern, peaking at 26.8% in Afghanistan and present in all other surveyed populations except Gujarat, India. These Near Eastern contributions might reflect contacts with nearby civilizations of the Near East (such as Elam in the Iranian Plateau to the west). These contacts might have begun before the Indo-Aryan invasions, but also continued by way of contacts among later Asian IE peoples (such as Iranians, who themselves had come in contact with non-IE civilizations) as well as Muslim migration to the Hindu Kush that continues to the present day.

Smaller but substantial American Indian contributions were also identified, particularly for Afghanistan (10.2%) and Gujarat, India (6.4%). The American Indian like genetic characteristics observed here might reflect contacts with Paleo-Siberian or Yeniseian cultures mediated by early Eurasian steppe cultures such as the White Huns¹² (perhaps in periods before the expansion of more characteristically East Asian genetic patterns in Central Asia via Mongolic cultures).

Small Sub-Saharan African contributions were observed in Pakistan (3.4%) and Kashmiri Muslims of Punjab, India (1.3%). These contributions might reflect contacts with Africans mediated by the Arabian Sea, similar to the maritime contacts that in modern times have brought the Sheedi and other African descended communities to southern coastal areas of Pakistan.

¹¹ Possible relationships between Indo-European (IE) speaking cultures and population structure have been speculatively discussed in two past issues of DNA Tribes® Digest, available at <http://dnatribes.com/dnatribes-digest-2009-07-29.pdf> and <http://dnatribes.com/dnatribes-digest-2009-08-29.pdf>.

¹² American Indian like genetic characteristics are observed to a limited degree in populations in and near Siberia. These are most pronounced in Paleo-Siberian speaking cultures (discussed at <http://dnatribes.com/dnatribes-digest-2008-10-25.pdf>) and to a smaller but substantial degree among modern Central Asian Turkic populations of the Altaian genetic region (discussed at <http://dnatribes.com/dnatribes-digest-2008-11-28.pdf>). These genetic similarities appear to reflect a relationship between early Siberian populations and the ancestors of American Indians, and in some cases might also reflect gene flow from the Americas to far eastern Siberia.

New Populations for September 25, 2009

We are pleased to announce the addition of several new populations to our database:

New Native American Populations:

- Awa-Guaja (Brazil) (34)
- Parakana (Brazil) (24)
- Tiriyo (Brazil) (41)
- Urubu-Kaapor (Brazil) (68)
- Waiapi (Brazil) (23)
- Zoe (Brazil) (42)

New Pacific Island Populations:

- Eastern Polynesian (New Zealand and Cook Island Maori) (1,970)
- Western Polynesian (Samoan, Tongan, Niuen) (644)

New European Populations:

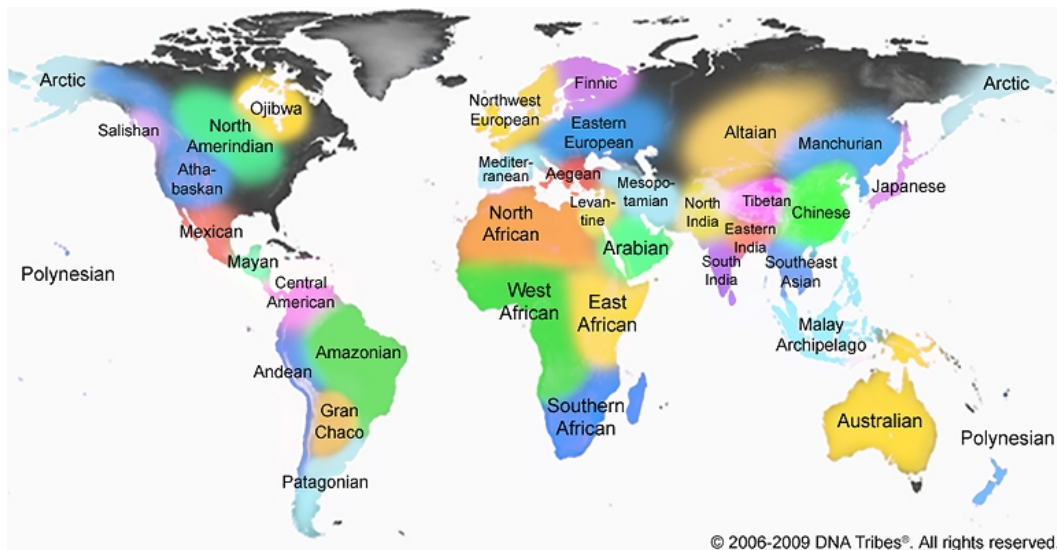
- Sweden (114)

New South Asian Populations:

- Chakma (Bangladesh) (113)
- Marma (Bangladesh) (113)
- Tripura (Bangladesh) (83)
- Veddah (Dambana, Sri Lanka) (36)
- Veddah (Pollebedda, Sri Lanka) (21)
- Veddah (Rathugala, Sri Lanka) (35)

New Global Diaspora Populations:

- Caucasian (New Zealand) (1,886)
- East Asian (Chinese, Vietnamese, and Korean) (New Zealand) (153)



World Regions Update: The inclusion of new reference data have allowed us to update our world region analysis. More information is available at: <http://dnatribes.com/populations.html>.

Updates: Previous DNA Tribes® customers who would like to update their results to include these new populations and our most up to date algorithms can order using the "Update Your Analysis" option through our secure online checkout at <http://dnatribes.com/order.html>.