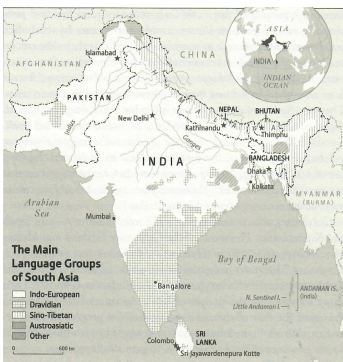
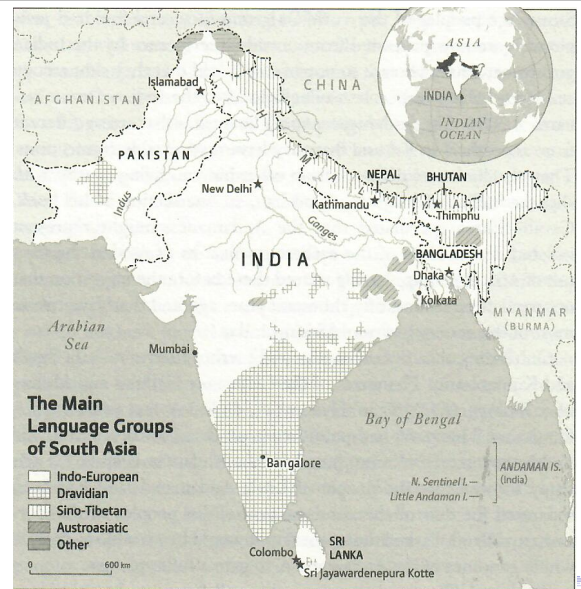


South Asia: the Indian Subcontinent

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Indo-European languages in the North

Dravidian languages in the South

Sino-Tibetan in the mountains.

Austro-Asiatic in small pockets in the east and center.

The Indus Valley Civilization



Bronze-age civilization in NW South Asia

4.3–3.8 kya

After that, the population declined.

Technology of the Indus Valley Civilization



Urban planning

Engineered water supply and drainage

Weights and measures.

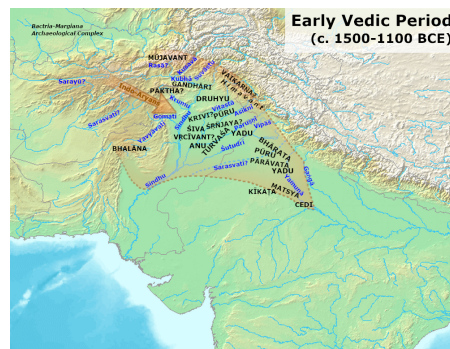
Trade with Afganistan, Arabia, Mesopotamia, Africa.

Writing, which we still can't read.

Large walled cities of baked brick houses

No horses or spoked wheels—a military disadvantage in the Bonze Age.

The Rig Veda



Oldest text of Hinduism: composed 3–4 kya

Describes a warrior god, Indra, who attacks enemies in a horse-drawn chariot and destroys their fortresses.

Places mentioned in Rig Veda are near Indus Valley

His people: the *arya*, or Aryans

Hitler and the Rig Veda

Thought the Aryans came from Germany.

Developed a myth of "Aryan purity," which he used to justify genocide.

Adopted the Indian swastika as a symbol of German nationalism.

This has made the subject one of extreme political sensitivity.

Did the Aryans of the Rig Veda destroy the Indus Valley civilization?

The timing works: IVC ended 3.8 kya. Rig Veda composed 3–4 kya.

Geography works: the place names in the Rig Veda are in the same region as the IVC.

On the other hand, the IVC didn't end suddenly, and there are no obvious signs of destruction in the archaeology.

What can we learn from genetics?

Mitochondrial DNA

Vast majority of mitochondrial haplogroups are unique to South Asia. Maternal lineages have been isolated for a long time.

No sign of Bronze-age invasion in the mitochondrial DNA

Y-chromosome DNA

A large fraction of S Asian Y chromosomes are shared with populations in Europe, Central Asia, and the Middle East.

20–40% of Indian men and 30–50% of E European men have a Y-chromosome type derived from a single male ancestor 4.8–6.8 kya.

This is similar to the situation in Europe, where Neolithic Y chromosomes were replaced by males who invaded during the Bronze Age.

Microarray data on variation w/i the nuclear genome

A cheap method for genotyping nuclear DNA.

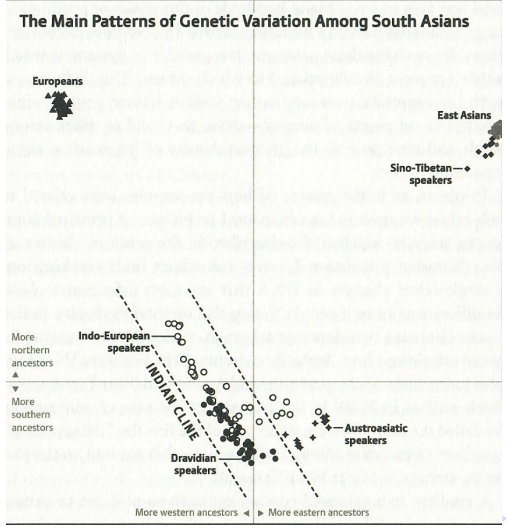
Requires that you identify in advance the nucleotides of interest.

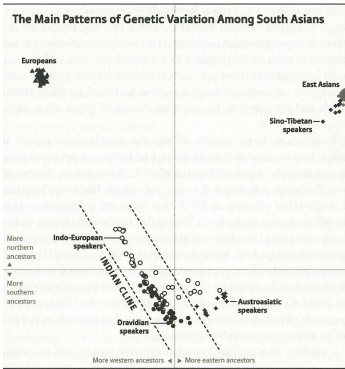
Arrays always focus on nucleotides that are known to vary.

This introduces a bias—cannot use microarray data to estimate population size or level of admixture.

This bias has little effect on principal components plots.

Principal Components map of South Asia





Most S Asian populations lie on a straight line between Dravidian speakers of the S and Europeans.

The pattern of variation is not consistent with any tree, so migration must have been involved.

Reich et al. argue that position on line reflects degree of admixture.

South Asia is a 3-part mixture

1. Foraging populations of the Mesolithic
2. Neolithic farmers from Iran, who arrived perhaps 7 kya
3. Yamnaya, from the steppes of Russia and Ukraine, who interbred with Iranian populations en route to S Asia.

ASI and ANI

Ancestral South Indians (ASI) were a mixture of mesolithic populations (whose DNA was similar to that of Andamanese) and Neolithic Iranians.

Ancestral North Indians (ANI) were a mixture of Yamnaya and Neolithic Iranians.

Modern Indian populations are a mixture of ANI and ASI.

The Andaman Islands



N-to-S chain in eastern Bay of Bengal.

Related to Dravidian speakers.

No admixture with ANI.

Proxy for ASI.

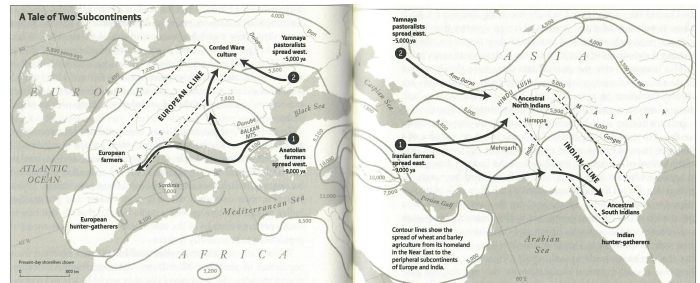
Doesn't assume these people haven't changed; only that those changes were independent of those on the mainland.

Admixture and social class

Groups with higher social class have more ANI admixture.

Irawati Karve suggests that the caste system began when a ruling elite imposed itself upon what had been a tribal society. The tribes became *jati* (groups w/i the Indian caste system), and were organized for labor.

European and Indian clines



In Europe, Yamnaya ancestry declines from NE to SW.

In S Asia, it declines from NW to SE.

The stories of the two subcontinents are very similar.