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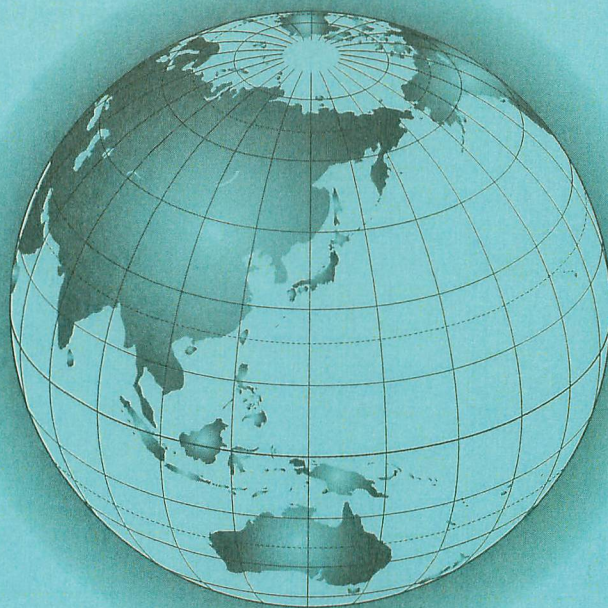
7th ESCA Harvard-Kyoto Roundtable

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with the assistance of HASE Noriko

Research Institute for Humanity and Nature (RIHN)
Kyoto, Japan
2006

Relationship between Genetic and Linguistic Differentiation
of People in Eurasia

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Dispersal hisotory of modern humans has been estimated from comparison of present day populations (e.g., Saitou and others, 1994; Saitou, 1995; Omoto and Saitou, 1997). For example, Saitou (1995) compared 30 human populations mainly distributed on Circum Pacific area and showed that there were six major groups corresponding to Africa, West Eurasia, East Eurasia, Sahul land, North America, and South America (Figure1). Consensus dispersal history emerged from these genetic studies (Figure2). However, this picture is based on simple population differentiation model, or phylogenetic tree model, and does not take into account effect of population admixture. It is desireble to study past populations as well as present day populations for elucidating detailed human movement during modern human evolution.

We have been studying genetic relationship of ancient Chinese populations with present-day populations using ancient DNA (Oota and others, 1999; Wang and others, 2000). We found that population in Linzi, the ancient capital of Qi kingdom, who lived around 2,500 years ago, showed close genetic affinity with modern European populations through comparison of mitochondrial DNA nucleotide sequence data (Figure3). Based on this genetic analysis combined with the radical hypothesis on higher order classification of languages, we propose that substantial part of people who initiated ancient Chinese civilization came from west, and both their genes and languages were different from those in East Eurasia at that time.

Chinese language is quite different from surrounding ones. How such geographical distribution was created? Recently, an astonishing proposal of new language super family including Chinese was suggested; Dene-Caucasian (Ruhlen, 1994). In contrast, most of languages spoken in Eurasia are classified as Eurasiatic. Natural explanation for these two distribution patterns is that Dene-Caucasian represents older migration, while Eurasiatic corresponds to later migration and expansion, resulting patchy, remnant type distribution of Dene-Caucasian.

Although genes were gradually diluted by continuous admixture with surrounding populations as shown by our study (Wang and others, 2000), language expanded and evolved to modern Chinese. Because center of present-day Eurasiatic language distribution is East Eurasia, ancestral Indo-European people could be genetically East Eurasian. However, their genes were diluted after long-term admixture with Dene-Caucasian people who lived in Europe. Therefore, I propose that Indo-European (Eurasiatic) and Chinese (Dene-Caucasian) expanded in Europe and in China, respectively. This can be visually represented by circular symbol of Yin-Yang dynamism, and I named it "Yin-Yang Hypothesis" (Figure4).

We recently started to collect ancient DNA literature and ancient DNA sequences and have been maintaining data base of ancient DNA, AGE (Ancient Genome Encyclopedia; www.ddbj.nig.ac.jp/aDNA/) at DDBJ (DNA Data Bank of Japan) (Figure5). I hope this database will become useful for many researchers.
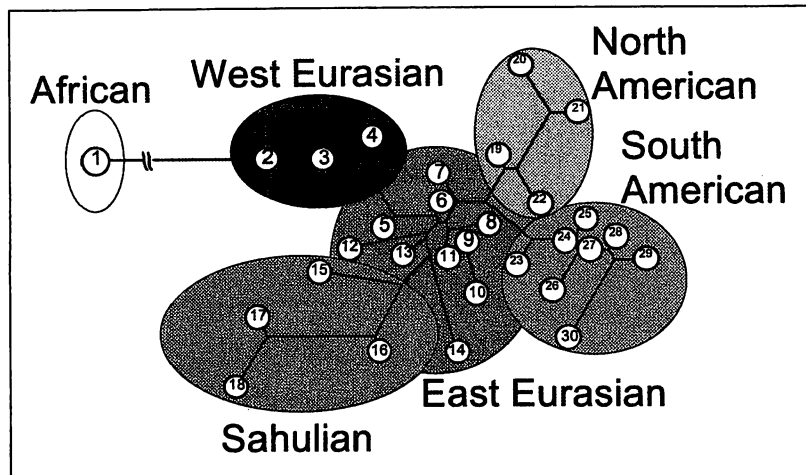
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Figure 1. Genetic affinity of 30 human populations estimated from 12 classic genetic markers (from Saitou 1995).
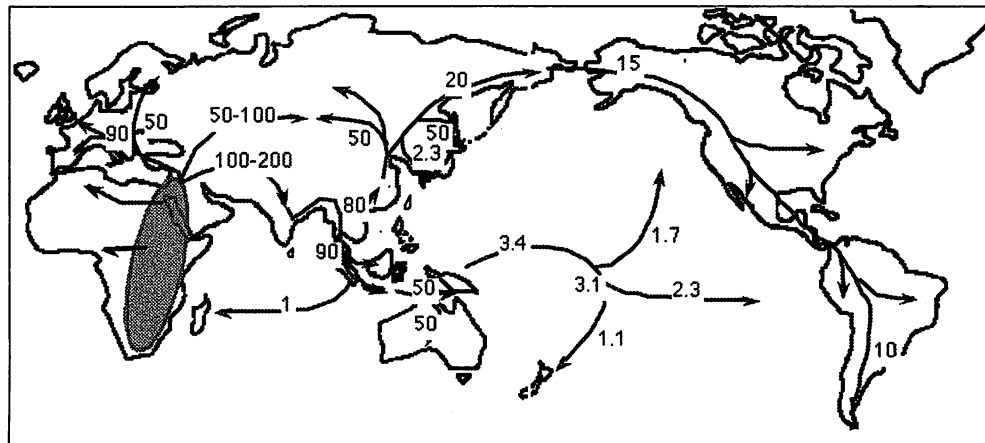

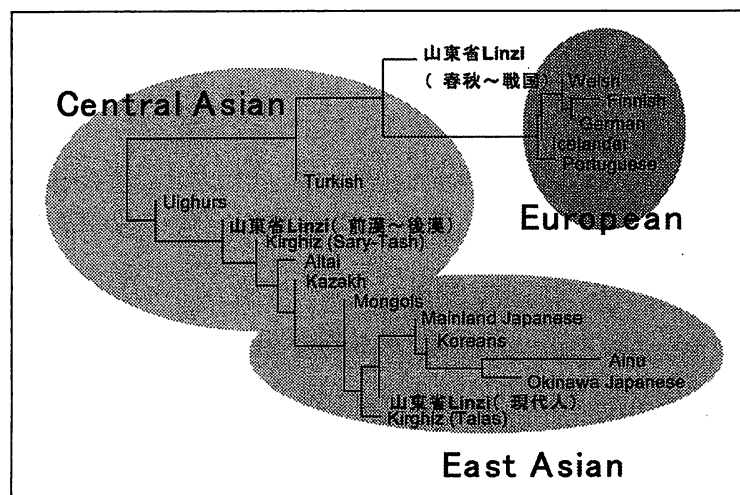**Figure 2.** Dispersal History of Modern Humans Estimated from Genetic Data (from Saitou 1997)

Figure 3. Relationship of three Linzi populations and modern populations (from Wang et al. 2000)
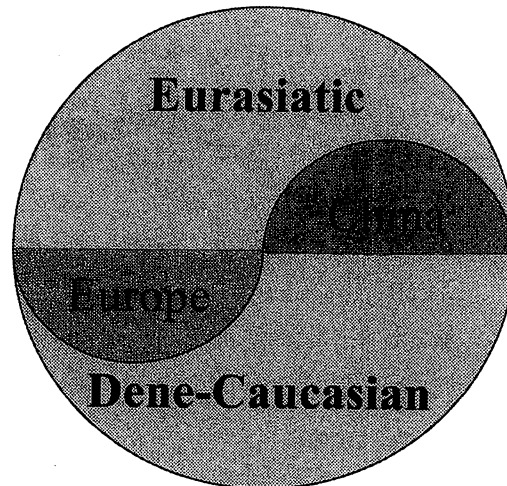
Figure 4. Yin-Yang Hypothesis on Geographical Distribution of Languages in Eurasia
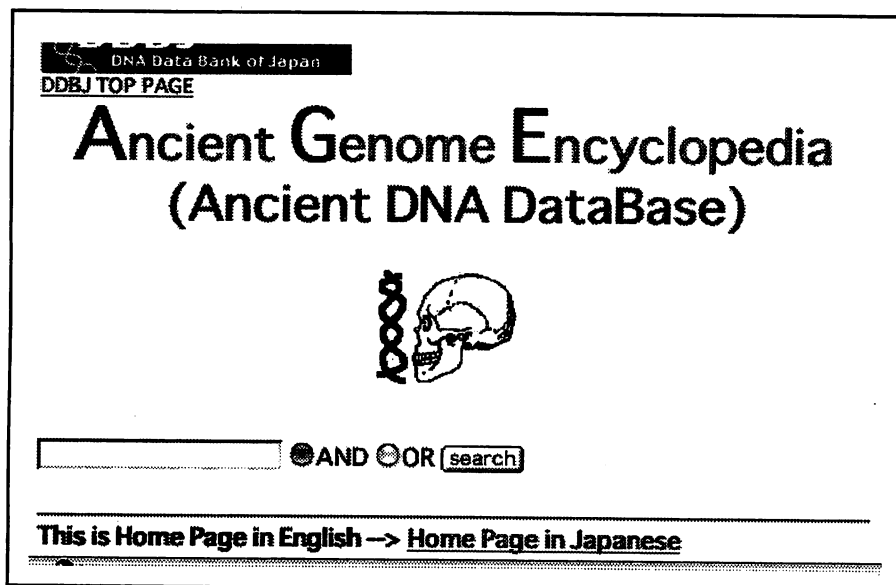

Figure 5. Top Page of AGE (Ancient Genome Encyclopedia)

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