COMMENTARY

States and their genetic consequences in central Africa

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Archaeogenetics and State Dynamics

Archaeogenetic analyses are usually aimed at elucidating the demographic history of small-scale societies, although frequently over large geographic and temporal scales. There has been significantly less attention paid to the analysis of state-level societies, except sometimes as a political framework within which smaller-scale interactions took place. This is curious, because it is widely recognized that state policies can have important demographic consequences (1–3). This relative lack of interest in the genetic impact of states may be associated with an assumption that historical sources provide sufficient information on such processes. In PNAS, the paper by van Dorp et al. (4) on the genetic effects of state formation in central Africa provides an example of such an analysis, indicating some of the likely consequences of state formation and functioning in the Kuba polity.

Over the past 20 y, the archaeogenetic studies that have concerned themselves with state-level societies have done so through a variety of approaches, ranging from straightforward claims of correspondences between haplogroups and state ethnicities (5), to analysis of the demographic consequences of state collapse and regeneration (6), to analysis of different forms of sociopolitical hierarchy often associated with complex societies (7). The relatively small size and recent historical trajectory of the Kuba state allow van Dorp et al. (4) to take a more global approach, comparing variability in autosomal, Y-chromosomal, and mtDNA genetic features for a sample in individuals identifying as Kuba or non-Kuba, the latter from a variety of stateless societies historically situated beyond the boundaries of the Kuba state. These samples were not gathered within the historical territory of the Kuba state, but rather in Kananga, the modern capital of Kasai Central Province in the Democratic Republic of Congo (DRC). This is understandable, given the logistical challenges of working in the DRC, and corresponds to common practice in archaeogenetic sampling, but it does result in the loss of information on the spatial patterning of genetic variation.

The research focused on levels of genetic diversity within the Kuba population and in comparison with neighboring non-Kuba groups. The results are significant and fascinating: Investigators found that Kuba populations displayed the greatest amount of genetic diversity and are relatively more similar genetically to each of the neighboring ethnicities samples than those different groups are to each other. This suggests a model in which the formation of the Kuba state, dated on the basis of oral histories to the early 17th century (see below), involved the amalgamation of genetically distinct preexisting populations into a broader Kuba identity during the period of state formation and consolidation, as well as some degree of in-migration from neighboring groups during the same period. As van Dorp et al. (4) note, this provides independent evidence for the dynamics of state formation in a case in which previously, the only available source of evidence before the European colonial period had been oral histories. On a broader scale, comparison of these genetic data to samples from other populations in the DRC and beyond provides evidence of a period of admixture in the late first millennium BCE, probably associated with the encounters of ancestral Bantu-speaking populations in the early Iron Age. This period of admixture was followed by the gradual differentiation of populations through the first and early second millennia CE.

Chronologies and the Complexities of State Formation

The van Dorp et al. (4) study attests to the potential of archaeogenetic research in analyzing the dynamics of state formation, particularly (but not exclusively) in cases in which other forms of data are minimally available. Even as we recognize the potential of these techniques, we can take account of some appropriate cautions. For example, the authors accurately note that oral histories may be subject to biases; it is also the case that chronological estimates based on such oral histories are frequently inaccurate (8). At the same time, van Dorp et al. (4) use Vansina's (9) estimate—based on

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Author contributions: S.M. wrote the paper.
The author declares no conflict of interest.

See companion article on page 593.

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Published online December 27, 2018.

oral history data—that the reign of Kuba's "first ruler," Shyaam aMbul aNgoong, began in 1620 CE as support for their own genetically derived estimation that a Kuba admixture event associated with state formation took place at ~1720 CE (95% CI, 1667 to 1891 CE). It seems somewhat risky to make use of oral historical data to buttress a chronology in one part of a paper, while noting the challenges in using oral history as a reliable guide to the past in another. This is particularly the case, given the relatively wide confidence interval of the genetic estimate, which, in chronological terms, could be associated with the disruptions of the slave-trade era in the 18th and 19th centuries as well as with Kuba state formation estimated a century earlier.

This raises a broader issue as well: the question of how we understand state formation and, thus, the social and cultural dynamics that might lead to population consolidation or differentiation. In the van Dorp et al. (4) paper, this seems to be fairly clear-cut: Kuba people were organized in small-scale village societies until the early 17th century when the culture hero Shyaam's arrival led to the unification of these disparate populations into the Kuba state. However, processes of state formation do not often seem to involve such an abrupt change of state between egalitarian village societies and a centralized state, in Africa or elsewhere (10–12). In the Kuba case as well, Vansina's (13) detailed exegesis of the oral corpus makes it clear that Kuba traditions recognized the existence of significant sociopolitical hierarchy well before the ascent of Shyaam as leader of the Kuba state.

These claims of pre-Shyaam political complexity may be the product of later bias, and it certainly is not possible to estimate the time depth of any such political institutions. Again, however, it is somewhat dangerous to use oral historical traditions as a sociopolitical framework for interpreting genetic data when those oral histories admit a variety of different interpretations. It is likely that—as in other parts of the world—processes toward political centralization in Kuba were gradual and extended over significant time periods. It is also likely that the demographic consequences of such centralization were similarly distributed over long time periods, making it difficult to establish a clear-cut beginning to state processes in this part of central Africa. There may, perhaps, be hints of longer-term, larger-scale processes in the genetic analyses in this research; thus, for example, there is a striking termination of admixture events among non-Kuba groups over the period 1400 to 1600 CE [figure 2C in van Dorp et al. (4)], just before the unique Kuba admixture event associated with state formation. It is interesting to speculate about whether this termination might be associated with increased group boundary maintenance during and after that period.

The paper by van Dorp et al. provides a very valuable perspective into processes of state formation in central Africa, a region where other sources of data for examining state dynamics are often limited.

The ethnographic evidence for this part of central Africa is rich and extremely interesting, and this may occasionally lead researchers to pick and choose particularly striking elements of the ethnographic record to associate with particular genetic data. Thus, van Dorp et al. (4) tentatively link the low Y-chromosomal genetic diversity among the non-Kuba Lele population to the Lele practice of polygamy, in contrast to the famously monogamous Kuba (9). This may be the case; however, it is notable that the Lele also historically practiced nonfraternal "village-wife" polyandry and seem to have been unique in the area in doing so (14, 15). This would presumably have increased Y-chromosomal diversity. At this point, it is probably impossible to estimate the different demographic and genetic consequences of simultaneous polygyny and polyandry, but this does suggest that the explanation of low Y-chromosomal diversity among the Lele may be more complicated than it appears at first glance.

The paper by van Dorp et al. (4) provides a very valuable perspective into processes of state formation in central Africa, a region where other sources of data for examining state dynamics are often limited. We can look forward to the results of more research of this type, as well as further efforts to productively combine archaeogenetic data with linguistic, archaeological, and historical data.

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