# Anthropology

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CHAPTER 2

# The Ethics of Genetic Ancestry Testing

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## Introduction

Genetic ancestry testing has grown in popularity among the general public, in part due to the increased availability and affordability of ancestry tests offered by direct-to-consumer (DTC) genetic companies. Curious about their ancestral past, consumers may submit a saliva or buccal swab sample, from which DNA is extracted and examined for particular genetic markers used to infer ancestral origins.

This chapter describes several types of genetic ancestry tests, the history of major genetic ancestry research projects, and companies that offer these tests, and further discusses the limitations and ethical considerations that arise from such tests. The scope and the interrelations of genetic ancestry research and consumer interest necessitate an evaluation of the ethics of this testing, including the basics

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and limitations of the technology, understanding of its results and implications, as well as how ancient and present-day populations contribute to growing databases that house ancestry information for many populations. We recognize that genetic ancestry tests are conducted in other animal and plant species, but in this chapter, we focus on human ancestry testing, although some of the ethical considerations discussed are applicable to testing on other species. We focus as well on the USA and regulations therein, principally because it has been the largest market for DTC genetic testing and the home to the largest genetic research projects historically. Regardless, laboratories in other countries and collaborative efforts with peoples in other regions are robustly growing.

## Background on Ancestry Tests

Genealogy is the study of family histories and tracing ancestral lineages, traditionally done by tracing through historical documentation and uncovering family stories. Genetic genealogy is a newer tool that examines these questions of family history and lineage in tandem with genetic testing, where the introduction of such testing may provide additional clues, and has been used in both research and recreational (such as DTC) settings. Genetic ancestry tests may reveal relationships between close biological relatives or may suggest more distant population affiliations. Additional tools, such as the use of social media to draw connections, are made available through some companies as well as coordinated by the genetic genealogy community. Several companies host DNA surnames projects where consumers are able to trace their last names with the Y-chromosomal DNA pattern inherited by male relatives in their families (Pomery 2009). DTC testing companies have stimulated consumers' interest in genetic ancestry through the marketing of these tests directly to the general public.

In addition to using genetic ancestry tests to learn more about human biological relationships, researchers use these tests to control for the ancestral contributions to one's genome in studies of disease susceptibility across human populations (Burgner et al. 2006; Manolio et al. 2008). By separating out the ancestral component, researchers seek to hone in on the genetic variants that are associated with diseases or other phenotypes.

While genetic ancestry testing has become popular in scientific practice and in recreational settings, scholars have noted the ethical implications of the concept of genetic ancestry testing, including the interpretation of results, and have raised concerns about the general lack of standards and uniformity across DTC companies (Lee et al. 2009). Some researchers are dedicated to identifying additional genetic markers to increase the precision and specificity of these tests (Nassir et al. 2009), whereas others are examining consumer attitudes and knowledge about genetic ancestry testing (Bloss et al. 2011; Wagner et al. 2012).

## Estimating ancestry through genetic tests

Genetic ancestry testing relies on both biological examination and subsequent statistical analyses to make inferences about a person's past. Individuals who are interested in researching their family history through genealogical information, surname searches, or ancestral histories may turn to genetic ancestry testing for additional clues (Royal et al. 2010). The broad designation of genetic ancestry testing encompasses a variety of tests in the laboratory setting and the consumer marketplace. These tests include analyses of mitochondrial DNA (mtDNA), Y-chromosomal DNA, and autosomal (non–sex chromosome) DNA. Each type of test has its strengths and limitations: they may glean information from a single ancestral line (mtDNA and Y chromosome) or uncover broader information regarding multiple potential ancestral backgrounds (autosomal DNA).

Examinations of single ancestral lineages are conducted with mtDNA or Y-chromosome DNA by tracing haplotypes, which are large blocks of DNA that are passed from one generation to the next. Because mtDNA and Y-chromosome DNA are not subject to recombination, large sections of DNA are largely unchanged from one generation to the next. Scientists are able to track the genetic variations of haplotypes to reconstruct population histories of human populations. For a scientific study, haplotypes are organized into haplogroups to determine the degree of similarity from one haplotype to the next. Generally, haplogroups are associated with geographical regions. For example, mtDNA haplogroup L is found most frequently in people of African descent and thus is thought to have originated in Africa. Similarly, Y chromosomes are sex-linked male chromosomes that are inherited in a paternal fashion. The Y chromosome has a non-recombining section (NRY) that contains genetic variants across populations, but it does not change much from a biological father to son, allowing scientists to trace paternal lineages. Females do not have Y chromosomes, but they may learn about their paternal lineage through the genetic testing of biologically close male relatives.

Autosomal DNA analysis can be used in concert with mtDNA or Y-chromosome testing, and it involves the use of Ancestry Informative Markers (AIMs) and bioinformatic tools to estimate biogeographical ancestry. AIMs are a collection of genetic markers with significant allelic frequency variation across populations (such as 30–50%). Researchers use probabilities based on the frequency of AIMs to infer the genetic ancestry of individuals or groups. AIMs are typically used to estimate ancestry because they are common in the human genome, representing 90% of human variation, and are generally quicker and easier to genotype and analyze than other types of polymorphisms. Most AIMs are single nucleotide polymorphisms (SNPs), which are allelic variants that occur on the level of one nucleotide change (A, T, C, or G) and must be present in at least 1% of a given population in order to be useful for analyses of differences. AIMs are used in aggregate, and they have involved as few as 34 (Shriver et al. 2003) to several

thousand markers across the genome that are correlated with continental origins as well as race/ethnicity categories (Yang et al. 2005).

Genetic recombination, a process that shuffles genetic contributions from each parent, takes place at every generation. Each chromosomal segment containing genetic variants such as AIMs originates from one of the parents and is passed down from one generation to the next; thus, each segment is tied to larger population ancestral histories. Geneticists are able to analyze the genetic variation across chromosomal segments to estimate the geographic origin of one's ancestors. For example, one chromosomal segment containing AIMs at high frequencies in one population would indicate a shared ancestor from another population in the same geographic region, and thus it is an indicator of shared or similar ancestral background. Some chromosomal segments might be derived from populations with common ancestors originating in Africa, whereas other segments might be traced to populations in Europe or Asia. Genetic ancestry tests use and make predictions about a person's ancestry based on comparisons of their genetic variation with other present-day populations. Researchers use these tests to theorize about human migration patterns, as well as to examine how human populations have changed over time and how they differ at the molecular level.

## Variation in genomic databases

Multiple databases containing data derived from AIMs are useful for capturing the variation for analysis to make ancestry estimates. Genetic ancestry testing companies rely on these databases to infer ancestral origins for their consumer base. Current databases are limited by the composition of individuals and populations sampled in a given geographic area. The individuals who are sampled do not necessarily reflect the entire genetic diversity within a geographic area, as they may actually possess rare alleles that are not found in the rest of the population or may lack common alleles. This limitation is a particular concern because lack of representation of genetic diversity within the databases may lead to inaccurate conclusions. A consumer who sends their sample to two different companies that utilize separate proprietary databases, with reference samples representing different global populations, may receive differing or conflicting ancestry estimates based on the AIMs used by each company and the reference populations within their separate databases (Kutz 2010).

## Statistical methods and ancestry inferences

Inferences that are made about ancestry from a DNA sample are based on probability estimates and thus are not determinative. A common computational tool called *structure* is used to infer ancestral contributions to a person's genome under the assumption that individuals in a study group represent mixtures from different genetic populations (Rosenberg et al. 2002). *Structure* requires distinct reference

populations, usually from distinct continental populations, to anchor the analyses of the study group. The AIMs represented in the study group are then compared to the reference populations, and the program estimates ancestral contributions coupled with a measurement of the likelihood that an individual's ancestry is derived from the different ancestral groups. In some populations, such as Native American tribes, there is a lack of specificity to distinguish the differences between tribes or geographic regions because there is typically a paucity of data representing tribes to anchor the results. Furthermore, the analysis of reference samples across databases, such as the level of accuracy and completeness at which they are sequenced, can influence the results and interpretation.

Statistical methods carry an amount of uncertainty, often not clearly conveyed to consumers, which may lead to incorrect assumptions about one's ancestral past. Rather, results may appear in the form of percentages of ancestral composition or DNA portraits complete with maps and pictorial descriptions based on the proprietary and public databases referenced for the given sample (Scott 2012). Definitive results beyond close biological relatives and recent ancestry are quite rare, as expansion of reference samples can alter the analysis and probability of the results for a tested sample. Genetic variants occur within multiple populations around the world and can occur more frequently with a range of other variants, providing clues to a population connection. Certainty would only emerge for ancestral testing from an allelic variant unique to a particular population, and while genetic variants occur in different proportions in different populations, unique variants are more likely a result of limits of databases and sampling practices than of the population. This point also holds true in research, where the tested samples and the inferences from them depend on the laboratory and public databases of information.

## Continental ancestry and race

Ancestry tests use statistical estimates that infer the likelihood of a person having ancestors originating from a certain geographical region, based on the genetic profiles of people who live there today. Biogeographical ancestry combines estimates of genetic ancestry, based on AIMs, with continental ancestries that are tied to geographical locations around the world. *Continental ancestry* typically refers to geographic origins represented by five major parental populations, originating from Africa, Europe, Asia, the Americas, or Oceania. A geographic origin is then inferred starting from the recent common ancestor based on the genetic differentiation seen in present-day populations that are considered Indigenous to these geographic areas (Nassir et al. 2009; Royal et al. 2010). Inferences are made about a person's presumed ancestral past based on certain DNA markers that are found at higher frequencies in one population compared to other populations. Researchers may use statistical estimates of data derived from multiple AIMs to infer deep ancestral relationships. Certain population groups who are relatively

homogeneous might harbor DNA markers that are found at higher frequencies compared to other populations. Some of these populations are classified as reference populations and are then used as comparison groups to determine degrees of similarities and differences with other populations. Ancestry estimates for a person's genome may be presented as multiple proportions of ancestral contributions, adding up to 100%, a reflection of contributions of different ancestral pasts based on the reference populations. For example, a person's genome may be composed of estimated proportions of ancestry from three continental regions, such as 60% African, 35% European, and 5% Native American, but may not necessarily provide precise locations or affiliation with any particular group.

Critics of genetic ancestry testing have cautioned against conflating social constructs of race with biogeographical ancestry (Lee et al. 2009; Royal et al. 2010; TallBear 2013). Historically, biological differences have undergirded constructs of race, such as the use of phenotypes (including skin color, hair texture, and eye shape) to differentiate between populations, and have associated those phenotypes with geographic origins. Given this history of racial typology and larger histories, continental origins have become loaded with additional meaning such that the social construction of geography, including the continents named by that discipline, means that receipt of ancestral links to a particular continent correlates to how race and cultural differences have been used to construct that place and its peoples (Beinin 2010). In part, this conflation relies on the use of present-day human populations to make inferences about the past (Bolnick et al. 2007), but those inferences are not themselves separable from the past or the present. In discussions regarding the return of genetic ancestry or medical results, it is important to remember that race (and its constructions) along with ancestry estimates may influence the identity constructs of those receiving the results, even in the face of contrasting information from cultures, communities, and environments.

## Ancestry Estimations of Present-Day Populations

While genetic ancestry testing is the technological backbone for many different companies, the technology began and is consistently advanced in institutional research, within both the academy and the private industry sector. This research then informs the products, but the major projects of genetic ancestry do not exist within a vacuum, and therefore their aims, progress, and problems are useful to review here. Many of these projects emerged from the success of the Human Genome Project, for which a draft genome was completed in 2001, and the projects attempt to address the need for larger and more diverse information about human genomes, including the AIMs of various populations. Subsequently, the more fully developed technology has been used for forensic applications, recreational purposes, and political disputes, and now as a part of new initiatives on precision medicine.

## Large-scale studies of human history

Beginning in the 1990s, scientists began to share and distribute DNA samples that were collected for previous research studies to carry out new studies to explore human genetic variation. From a practical and funding standpoint, this production of a genetic research commons makes sense; however, from various Indigenous and community-based standpoints, this work is viewed as extractive at best and harmful at worst, with little if any benefits accruing to their communities particularly. These pooled samples were often used to examine human genetic variation not only in the present but also through a model of how the present may represent the past, with a smaller grouping of ancient remains contributing to the knowledge of genetic variation in the ancestral past.

To estimate and model how present populations may be related and come from one another in the past, scientists use genetic ancestry testing along with statistics and geography, all of which include particular assumptions. Even as the testing results may impact a whole group or community, an individual is often used as a representative of that group; however, conclusions from a sample can impact more than just an individual, revealing genetic information that may affect the whole group. This potential harm can be especially concerning if the migration and ancestry research is done as secondary research on samples. Relatedly, using present-day peoples and their samples as proxies for ancestral populations has possibilities for models but can also come with harms, but explicit and more embedded within the research. For example, assumptions about the continuity and lack of admixture of populations track to older notions of differentiations in "races" but can be more submerged in the analysis than reporting about the likelihood of inbreeding or stigmatized health conditions within a population, which are more explicit harms. This assumption also has to take into account that genetic development has occurred between the present and the ancestral past, so there is not a perfect correlation even in conserved regions of DNA. Attention to the amount of certainty and uncertainty of these inferences can help mitigate this concern. While the availability and quality of ancestral genetic samples have expanded through obtaining DNA from sources such as coprolites, hair locks, and tooth enamel, the amount of this resource is still remarkably small and ethically complicated by concerns over how these remains are treated and used for purposes that their owner could not and did not consent to, and how they are used to represent present-day peoples. Therefore, inferences from present-day populations into human ancestral past will continue to be made, but they can be made with attention to larger impacts and the limitations of the inferences.

*The Human Genome Diversity Project* In 1991, the Human Genome Diversity Project (HGDP) sought to increase the number and the ethnic and geographical diversity of individuals included in genomic research (Cavalli-Sforza 2005).

In seeking diversity, the researchers identified populations throughout the world who were considered to be Indigenous to a given geographical area, particularly as these individuals were imagined to have less genetic admixture (based on the idea of ancestral and present-day population distinction instead of interaction) due to their isolation. However, many groups who refused to participate had previous experiences in which multiple forms of intellectual property were taken from them, such as knowledge from ceremonies, medicinal plants, art, and stories. The idea that undergirded the HGDP research of purity versus admixture was catalogued by Jenny Reardon as one of its fatal flaws, along with the targeting of communities instead of cultivating partners through engagement and thereby successfully recruiting participants (Reardon 2005). Indigenous peoples who did not perceive benefits, or who felt that the harms (such as social, psychological, political, and epistemological) outweighed any perceived benefit, from this research called for its halting. In the end, the HGDP-CEPH (Centre d'Etude du Polymorphisme Humain, or Human Polymorphism Study Center) database included samples from 51 distinct populations from 1064 individuals, and it is still widely used for a range of secondary research, including human genetic ancestry research. None of the populations that are included are living in the USA despite many of the researchers being based in the USA, in large part due to pushback by tribal communities who joined together to voice their concerns. Communities who are represented in the database have not been engaged in the research process since the inception of the database. In the end, the Indigenous peoples did find a small benefit – building a global coalition to have their voices heard instead of only being viewed as a natural resource from which to extract samples and data.

*National Genographic Project* The National Genographic Project (NGP) emerged to conduct genetic ancestry research on a global scale. This project aimed to draw on the lessons learned from the HGDP by working to build partnerships with target populations, including having Indigenous peoples on their advisory board. The NGP engages with some of their target populations by creating a range of products, such as research papers, news stories, documentary films, and other educational media. In some cases, the NGP has invited advisory board members to coauthor publications (Zhadanov et al. 2010). However, the narratives that are perpetuated in these materials have been critiqued from many sources in how they explicitly state their purpose to be antiracist while re-inscribing racial difference at the molecular level and repeating differentiations between populations (Wald 2006; TallBear 2007). It is worth noting here that *population* often refers to a statistically bounded group, while *people* refers to the social community that may or may not be reflected in a population (Barker 2004).

Furthermore, in an effort to expand their research datasets, to engage a largely first-world public, and to garner additional funding, the NGP has a DTC arm

that offers collection tests to paying consumers much like other DTC companies but with the explicit information that the consumer will be a part of a larger research project. Whether DTC information is used for research, and therefore includes proper consent to such, has been a contentious issue that has moved forward the discussion on tiered and secondary-use consents in general. While other DTC companies do engage in research with their databases, the NGP explicitly notes this work and has created a hybrid research participant/consumer scenario.

*International HapMap Project* The International HapMap Project, begun in 2002, uses a deliberate focus on engagement with partner communities, including consultation. Like many of the projects preceding it, and unlike the business model of DTC companies, the information from the HapMap Project is released to the public as it is available. Overall, the HapMap Project intends the genetic ancestry information to be used in health fields, particularly for the identification of disease genes and pharmaceutical response genes. Four populations began the HapMap, with multiple members of the partner communities contributing to the population information through a robust informed consent process: Yoruban-descent persons in Nigeria; Han Chinese–descent persons in Beijing, China; Japanese-descent persons in Tokyo, Japan; and European-descent persons in Utah, USA (International HapMap Consortium 2003). These four reference populations have helped in producing an understanding of ancestral similarities and distinctions, and now seven additional populations have begun partnerships with HapMap. Like the first four communities, these seven new populations are also seeking benefits of biomedical research, and they have seen good practices involving the initial partners.

*Public genomics projects* Given the popularity of personal genomics, research intersections have emerged that bring together the genomes of people willing to have them publicly presented, such as the Personal Genomes Project and the 1000 Genomes Project. The first project, founded in 2005 and that spanned four countries (USA, Canada, UK, and Austria), sought to present the data from a range of genomes publicly to better support research into health and traits derived from genomic information (Church 2005). The individuals who have submitted their information to this project have been vulnerable to re-identification, emphasizing the importance of protecting the privacy and identities of those who have contributed. The 1000 Genomes Project (2010) sought to use the reduced cost of genomic sequencing to similarly create a large, publicly accessible database of genomic information, and to further share that information through networks of public databases.

## Linking ancient DNA with present-day populations

While research on present-day humans has a vast array of possibilities, including ethical considerations and limitations, work conducted with ancient DNA (aDNA) samples is both more finite and more acute in its ethical considerations. Many aDNA studies help to address the often-problematic conflation of present-day populations with ancestral populations in genetic ancestry testing (Royal et al. 2010), providing evidence of the DNA of peoples found in a given region dated to a particular time. However, these studies are conducted to address questions that not all peoples believe are unaddressed in their epistemologies, such as: where did we come from, and how do we relate to one another? Furthermore, the studies venture into a particularly vexed area of ethics and law, as well as considerations around what kinds of inferences are made and what those say about contemporary populations. For example, the remains that have been used for aDNA studies, while not covered under the Belmont Principles for informed consent, are often disputed between scientists and communities who claim them in order to protect them.

*The Native American Graves Protection and Repatriation Act* In response to historic injustices including looting of gravesites, the USA enacted legislation to repatriate remains of Native Americans to the present-day tribal nation that claims or traces responsibility and lineage to those remains. The Native American Graves Protection and Repatriation Act (NAGPRA) of 1990 also came on the heels of the developing genetic and genomic technologies, and there have been multiple disputes about newly discovered remains as well as illumination of loopholes in the original law, such as inapplicability of the law to remains found on private lands.

The Kennewick Man, also known as the Ancient One, has been one such dispute. Multiple tribes laid claim to protect the remains discovered by the Columbia River in 1996, but efforts from scientists including James Chatters allowed the remains to be examined and experimented on for a short period of time in the midst of the nine-year court battle regarding custodianship of the remains. At the time these examinations were conducted, the remains were being held by the US Army Corps of Engineers, and at that time no genetic evidence was successfully found. A recent publication showed that DNA was extracted from a sliver of bone tissue, a sample that was entirely destroyed in the process, and the resulting information confirmed the assertion of the tribal groups in the area that the Ancient One is Indigenous to the Americas (Rasmussen et al. 2015).

*Use of ancient DNA to reconstruct history* Two recent and large-impact studies of aDNA and ancestry involve remains found in places that are not protected under US federal regulations – private lands and in an underwater cave in Mexico. The remains of a young child were found on the private lands of the Anzick

family in Montana in 1968 and later were analyzed by Sarah Anzick, the daughter of this family, who trained and worked at the National Institutes of Health on genomic technologies. This analysis demonstrated the Clovis child to have a genetic ancestor in common with 80% of all Native American peoples (Rasmussen et al. 2014), and that the remains were 12 600 years old. While quite literally the child had no direct descendants, this ancestry information has been touted as valuable information gained from the remains, and after such genome sequencing was successful and complete, the Montana tribes who had petitioned for the remains to be returned to the ground were able to hold such a ceremony in June 2014. Importantly, these tribes were not necessarily shown to be connected genetically to the remains but based their claim on ties to place, to land, given the vast majority of Native American samples in databases are from South American peoples, not US tribes, many of whom refused participation in such genetic sampling and databases.

Naia, the "Hoyo Negro" woman, named after the "Black Hole" cave in which her well-preserved and quite complete remains were found near the Yucatan Peninsula in 2007, was dated to be between 12 000 and 13 000 years old, and was also found to be genetically related to present-day Native American populations (Chatters et al. 2014). Given the completeness of her remains and further development in age and facial structure at the time of her death in comparison to the Clovis child remains, Naia provided scientists with another way to think about how morphology and genetics have changed over time (Chatters et al. 2014).

Overall, aDNA has been used to look at the connections between remains and present-day peoples, to give different points along the genetic history of migrations and evolutions that have led to our differences today. However, with all of these remains, there exist concerns around the treatment of the remains, their destruction in processing to obtain genetic information, and their liminal positionality as not quite human and not quite object or resource, bringing forth the question of who owns or who speaks consent for the remains.

## Contradictory results

Results may not only be contradictory to one another across databases, but also be contradictory to the knowledge of a community or a family. Given the limitations and proprietary nature of many genetic databases, samples may be tested against different sets of reference AIMs, and therefore the results can easily be distinct from one another. Statistical estimates of ancestry are based in probabilities with room for error. In 2003, the General Accounting Office report submitted a standard DNA sample to four different DTC testing companies for 10 different tests and found the range of results to be contradictory and inconsistent with one another (Kutz 2010).

Issues may arise when consumers of this information seek personal connections to a community based on estimations of shared ancestry or when findings contradict

one's beliefs about their ancestry. Two well-publicized examples include the media-circulated and produced stories of the ancestry of Oprah Winfrey and of Henry Louis Gates, Jr., both of whom initially were told they had particular South African and European ancestry connections, respectively. Subsequent testing from other companies indicated their origins were more likely West African and included African ancestry, respectively. Currently, there is a push for standard samples to be used to test the accuracy of the companies' and researchers' analyses, but those standards would be incapable of covering the full range of human genetic diversity. These contradictions, though, can lead to confusion around identity, as well as concerns for laboratory practices that utilize these results for other applications and analyses, such as migration studies and pharmacogenomic studies. This last concern points to the concern that ancestry information, or a proxy of race, may be used, but the specific allelic variations in the genome are the best markers for determining not ancestry but the possible effects of drugs or commonly shared genetics.

Even when results are consistent with each other, they may be contradictory to the ancestral beliefs of the individual or community. Many tribes are concerned about use of their DNA samples in human migration studies because the scientific evidence may contradict cultural and deeply held beliefs about tribal origins. Furthermore, studies that suggest that a tribe migrated across the Bering Strait from Asia may have political implications and challenge tribal sovereignty and land rights. Many Indigenous and other knowledge systems, such as those found across and throughout religious texts, include information about the origins and movements of peoples, particularly how they are connected to place and in time. Contradictions between these two sets of knowledge can have harmful implications for the nonscientists, as their knowledge undergirds claims to homelands or territory, and responsibilities to other groups as well. For example, both the Havasupai and the Nuu-chah-nulth peoples donated their DNA samples for biomedical research, but samples were in scientific publications on human migration studies in which the tribes were identified without their permission (Rubin 2004; Wiwchar 2004; Harmon 2010). The scientific results indicated that the tribes originated from Asia and crossed the Bering Strait. These studies contradicted tribal origin stories and beliefs about where their ancestors originated from, causing stigma and psychological harms to their identities and knowledge systems. In both cases, the researchers did not partner with the tribes for richer analysis, such as regarding elaborate clan relational systems that were trivialized by the use of inbreeding coefficients, thus suggesting that the tribes had engaged in taboo-related activities. For both of these peoples who make a claim to homeland in their current and historic geographic locations, such migration studies contradict their knowledge and their concordant responsibilities to that geographic location. As opposed to achieving additional benefits through consultation and partnership, such as culturally informed analysis and additional data to support scientific

analysis, the research caused harms to the community and to many further communities in their stigma against participating in research.

## Recreational and Forensic Uses of DNA Ancestry

Data derived from DNA can reveal information about a person's ancestry, make predictions about a person's phenotype, or influence a person's perception of who they are related to. Recreational use of genetic testing often refers to nonmedical applications of genetic technology for the purposes of learning something "fun" about oneself. Recreational use of genetic tests may include seeking additional information about one's ancestral background to identify close or distant relatives or to reconstruct family trees. Recently, genetic ancestry tests have been used in the forensic setting, either to re-identify a suspect based on genetic markers, or to find close relatives of a suspect based on similarities between a DNA sample and data contained in databases of ancestry companies.

### Satisfying familial curiosity

Many consumers of genetic ancestry tests seek out results to satisfy their curiosity regarding ancestral connections to groups of people and places, and to find potential connections to extended family members. DTC genetic-testing companies, such as 23andMe, Ancestry DNA, and African Ancestry, offer genetic-testing kits to consumers who are interested in learning more about their genetic ancestry by mapping connections through close relatives or distant kinship. Consumers may purchase a kit with which they collect a saliva sample and send it back to the company with payment. These ancestry companies utilize their own proprietary databases of AIMs and reference samples, which may produce different results across companies. Given the resource of their own databases, these companies are also venturing into research by comparing the prevalence of phenotypic traits in relation to one another and connecting participant surveys with data based on their genetic markers.

Following conversations within the American Society of Human Genetics (ASHG), an Ancestry Task Force was formed, and in 2008 they published a set of recommendations to increase the amount of research to improve the accuracy of the testing results, to develop guidelines to facilitate the return of and interpretations of results, and to inform the public of the limitations of ancestry testing, particularly the testing offered by DTC companies, calling for greater accountability of these firms as well (American Society of Human Genetics 2008). In a subsequent 2010 paper, the ASHG Ancestry Task Force further recommended "thoughtful and rigorous use of ancestry estimation" by academic researchers. Their recommendation for a national roundtable to discuss the issues

of concern and work to develop solutions between DTC companies, researchers, consumers, and other key stakeholders has occurred in two iterations to date (Royal et al. 2010).

Furthermore, presentations made to the US Congress have described the interrelations between consumer and researcher attitudes, as well as the lack of standards, and have argued for increased policy and legislation for the protection of individuals and groups (Sarata 2008). This policy briefing and empirical research on consumer motivations have demonstrated variable degrees of knowledge about genetic science and statistics, and argue for increased regulation of the tests and guidelines for standardizing the ways in which results are returned to the consumer.

## Genetic nonrelatedness

*Nonrelatedness* refers to the ethical concern of uncovering through genetic ancestry testing, including maternity and paternity testing, that someone thought to be a biological parent of a given person is not their biological parent. It is commonly noted that nonpaternity, where the person who is believed to be the biological father is not such, likely occurs in up to 10% of the global population. Unexpected discovery of nonmaternity, on the other hand, is much less common and may occur through a form of relatedness, such as a sister, mother, or aunt raising the child born from their sister, daughter, or niece. Nonrelatedness therefore occurs when children are raised by other families entirely, through adoption or mistaken identity for example. As technology has advanced, and the use of *in vitro* fertilization has increased, the possibility of nonmaternity through implantation of a fertilized egg that originated in another woman increases, and newly approved three-parent embryos also alter our social and biological understandings of motherhood (Gallagher 2015). Often, information about nonrelatedness may not trouble the family unit, which has socialized and developed schemas that do not limit kinship to genetics, but it does have the possibility to alter these familial dynamics.

The general concern about genetic ancestry testing of participants and consumers not fully understanding the results and their implications is further complicated by nonrelatedness events that either are revealed by or remain obscured within the data. Particularly with genetic ancestry testing, including SNP analysis and Y-chromosome testing, the deep ancestry that a person and family thought they knew about themselves may differ, as well as the near ancestry of relatedness. This information, once received by a participant or consumer and contrary to the previous understanding of self, may alter their identification and have wider implications for their families and their communities. Given the commonality of nonrelatedness, and the very social and not only biological ways in which we create families and communities, genetic ancestry testing could be vastly complicated by relatively common nonrelatedness events, including issues around

self-identification of samples and family who may correlate genetic markers to a geographic location in Europe while a nonrelated event, of which they do not know and the genetics may not show, could have brought those genetic markers from Asia. Furthermore, given the greater participation of individuals in Europe in research studies and of peoples of European descent in the consumer community, the results might make better predications for some groups of peoples compared to others who do not participate so fully or benefit from the sciences (Bustamante and De La Vega 2011).

Beyond nonrelatedness, there are also potential secondary uses of samples that may impact individuals and their families, such as the recent revelation about 23andMe selling data from their proprietary database (Regalado 2015). The partnership created with Genentech appears to put a value on the consent of participants and to allow a sharing of proprietary information through a partnership in which Genentech paid $60 million for access to Parkinson's patient information – a scenario that appears to entice participants to consent by offering money in exchange for data, rather than a business partnership.

## Ancestry estimates in health and medicine

Several efforts have aimed to incorporate genetic ancestry estimates into medical studies to promote integrated clinical care. These efforts, called *precision medicine*, may utilize ancestry information to control for ancestry in order to disentangle clinical phenotypes that are more common within a certain population. Precision medicine aims to utilize patients' genomic information to determine the most optimal therapeutic options for each patient. A potential application that integrates genomic information with drug treatments is pharmacogenomics, which tailors drug and dosing prescriptions to individuals with certain genotypes, thus enhancing clinical treatments to individuals.

The use of racial categories in clinical practice has created challenges around the interpretation of genetic ancestry information, both for physicians and for the public. First, racial categories do not overlap neatly with genetic variation. Genetic variants that occur more frequently in a continental population are not proxies for racial categories. Furthermore, given the varying degrees of admixture within a population, physicians may incorrectly conclude a person's continental ancestry, demonstrating a limited utility of the information. Even self-identification has limited utility, as the genetic variants in question could occur in other populations or a patient may have no knowledge of a particular continental ancestry. For example, BiDil, a drug that combines two medications for congestive heart failure in a fixed dosage, was tested in clinical trials but initially did not gain approval from the US Food and Drug Administration (FDA). Subsequently, tests were done in African Americans, and data given to the FDA the second time proved more convincing about efficacy, so it was approved to be marketed to African Americans. The company noted that the African American population is genetically

distinct, thereby leading to differential effectiveness of the drug in that population compared to others. However, those claims were later shown to be scientifically inaccurate.

In 2015, US President Obama announced the Precision Medicine Initiative in his presidential address (White House Office of the Press Secretary 2015). The NIH began a series of workshops that summer, with much of the discussion focused on the promise of delivering tailored treatments using genomics. However, few studies to date have demonstrated a clear pathway forward. Furthermore, only a few genes have been directly connected to specific disease states, such as Huntington's disease, and even fewer genes have been directly connected to better understanding effective drug interactions.

## Forensic applications of ancestry tests

Forensic applications of ancestry tests have been in use for several years and are being applied more frequently. Genetic ancestry testing is emerging in forensic sciences, primarily for re-identification purposes.

*Reconstruction and facial predictions* New research, called *forensic DNA phenotyping*, uses genetic polymorphisms of certain genes to predict a person's appearance, from skin color to facial structures and features, and tries to determine a person's ancestry based on AIMs. However, this approach has raised concerns about the scientific accuracy of the technology and the potential to exacerbate racial profiling among law enforcement, and it may infringe on the privacy of many people who fit certain profiles (Pollack 2015). In China, using the same technology, artists and environmentalists have partnered with researchers to collect trace amounts of DNA from litter on public streets to re-identify or to predict the appearance of the person who disposed of the trash and posted pictorial depictions of the presumed suspect in attempts to publicly shame litterbugs (Cope 2015).

*Familial Identification* In Idaho, police obtained a court order to access Ancestry.com's database of genetic data and names, locations, and birthdays in an attempt to crack a nearly 20-year-old cold case (https://www.genomeweb.com/scan/when-cops-met-ancestrycom). The police identified a suspect based on close DNA matches and information contained in the company's database of social networks. The suspect was eventually cleared in the case. This approach prompted concerns about customer privacy. These secondary uses of ancestry information to identify family members of crime suspects are troubling because, as well as conducting research with their consumers, the forensic possibilities demonstrated by the release of information to police by Ancestry.com have been viewed as a privacy violation and an unintended possibility by many participants, consumers, and their families.

Many of the people who have donated a sample for one purpose (such as learning about their ancestral past or finding close relatives) were not anticipating uses such as access by law enforcement. Such use of database access may limit participation in ancestry and other research, and limit the ability of ancestry companies to increase coverage among certain populations who already have a history of being racially profiled.

## Politics and belonging

Genetic genealogy incorporates genetic ancestry testing information, usually from DTC companies, to augment the stories of families. For example, on Ancestry.com, a consumer can search through historical records and build their family tree with that information, but if there are gaps or if one wishes to know more about additional branches on the tree, then they can send in a cheek swab to AncestryDNA.com and find extended genetic relatives as well. This information, however, is not without larger impacts than the fleshing out of a family tree, as genetic ancestry information may be viewed singularly as "the" information about identity, or as "more accurate" information about identity in the face of conflicting familial histories or documentation. This centralizing of genetic information is being questioned from many angles, including how it is consumptive and extractive of resources from marginalized populations by imperialist populations (Reardon and TallBear 2012; Kolopenuk 2014). Furthermore, the tests may contradict not only known genealogical information but also one another, as the proprietary databases at different companies or with different researchers may lead to distinct results about lineage, such as percentages of admixture or more precise locations on continental ancestry estimates. This information and its conflicts can also inform belonging, not only for self or group identification, but also for citizenship and entitlements. The risks to psychological well-being should be considered along with the assumptions, accuracy, and limitations of any given genetic ancestry testing.

*Native American Tribal Membership* The Freedmen of the Five Civilized Tribes have utilized genetic ancestry testing to attempt to prove their relationship to the tribes, information that those sovereign nations have in general rejected for citizenship applications (Koerner 2005). Other Native American tribes have utilized maternity and paternity testing to disenroll tribal citizens (Taylor 2011) or to limit tribal enrollment eligibility (Eastern Band of Cherokee Indians 2010). These policies use scientific ideas of relatedness through genetic ancestry testing to harm both individuals and communities, privileging particular biological forms of relatedness over social forms, and thereby limiting the possible kinds of family structures. With disenrollment, harms include loss of access to resources and support, denial of identity and psychological harm from such, as well as social stigma.

*National Citizenship* Recently, the US Immigration and Naturalization Service has turned to genetic ancestry testing to prove the stated relationship of a sponsor to an applicant for citizenship (US Department of State Bureau of Consular Affairs 2015). Yet, some nations use this testing not to exclude or to idealize scientific evidence as the penultimate kind, but instead to allow those who have found roots in their country to become citizens and thereby contribute to the responsibilities and share in the rights of such a role. For example, Isaiah Washington successfully applied for citizenship in Sierra Leone after an ancestry test noted the people of that present nation as his most likely African ancestors, and Oprah Winfrey used information from one ancestry test to commit to serving the young women in South Africa, where she was told her ancestors were likely to have come from (Watanabe 2009; 23andMe 2014).

Like so many other stories we tell of our families and our past, the stories of genetic ancestry are not without their constructions and their extensions, such as those seen around political belonging as discussed in this chapter. Genetic genealogy, like that used by Winfrey and Washington, is catching on as a reality television trend, and celebrities do not always consent to the genetic testing, nor are they immune from the desire to shape the narrative that emerges from the testing and research. When research showed actor Ben Affleck's ancestor was a slave owner, he attempted to keep that information out of the PBS show *Finding Your Roots* (PBS 2015). News stories erupted over this effort, and the stories of the multiple slaveholding ancestors were later told, but this effort demonstrates the importance we place on our ancestry within this country, not just regarding the general geographic ancestry but also in regard to the impact of our ancestors' specific actions as a reflection of ourselves, such that this major celebrity felt it important to distance himself from the history and to not engage with larger questions of privilege.

## Conclusion and Emerging Concerns

The technology of genetic ancestry testing continues to develop, and so must attention to and awareness of the ethical issues involved in the technology, the research, and the uses of this testing for a variety of purposes, some of which could not be imagined even at this writing. The most recent progress in human migration research has further shown that continental populations are more likely to be diverse than singular (Raghavan et al. 2015; Skoglund et al. 2015), so continental ancestry would still refer to a wide variety of peoples. These contrasting studies also highlight the concerns about taking such testing as concrete, unequivocal evidence of ancestry, as the findings may differ, or be at odds with each other, and may not represent the whole picture. Concerns around the use of present-day populations as stand-ins for ancient populations should be taken together

with concerns about testing of ancient remains, the ethical concerns of which are made clear in the cases of Kennewick Man, who was recently "proven" to be Native American (Rasmussen et al. 2015); the remains found in the Hoyo Negro cave; and the remains found on the Anzick property – all of which are connected to living populations through claims, analyses, and/or geography.

Furthermore, the coordination of technologies is an emerging issue in the ethical evaluation of ancestry testing, as concerns about identity have largely been tested and theorized in relation to person-to-person interactions. However, recently a computer programmer showed that such information could be used to discriminate on the Internet, limiting sites to those with certain demonstrated percentages of continental ancestry through a program called Genetic Access Control (Lee 2015). Even the "possible uses," which are distinguished from the "flaws," of this program using the database information include ones that essentialize gender, religion, and ethnicity, which, like social ancestry, are fluid constructions with biological components. While here the consent to how the data are stored and shared returns as an important concern, how the data can be requested and required for access brings up new and not fully explored concerns, which hearken to older exclusions seen in anti-miscegenation and Jim Crow laws, as well as the separation of groups that contributed eventually to the Nuremberg Principles.

Even as curiosity leads more individuals each day to seek out their biological ancestry through genetic testing, the limits of that information and the ethical concerns inherent to it and to its further applications should be further understood. For those researchers engaged with the testing, communicating and understanding those limitations as well as contexts of appropriation and resource extraction are important for facilitating and gaining truly informed consent, to create research relationships and not extractive gathering of data from human bodies.

# CHAPTER 3 Witchcraft in Africa

*James H. Smith*

In the vast province of Maniema, in the Eastern Democratic Republic of the Congo, off the long dirt road that extends from the old Arab Swahili slave trading center of Kasongo to the provincial capital of Kindu, one passes by a site of great strategic importance, known only to locals and a small number of foreigners. Residents describe it as an international airport for witches, a major center for the global trade in witchcraft materials and technologies. Like others throughout the region, they understand witchcraft, or uchawi/ulozi, to mean the use of occult means to harm others, and they make distinctions between witchcraft and other forms of magic, such as sacrificing to ancestors for the good of everyone. The residents of this place would be among the first to admit that the village certainly doesn't look like it's home to an international airport, for witchcraft or anything else. But people in Maniema do not assume that the invisibility of the airport, its planes, and its cargo are evidence of their non-reality. As one of my area friends and informants put it, "This airport is crucial to globalization, and what is going on there shows what globalization really is!" In other words, there was a partially concealed secret about power and exchange in the world at large that was made visible through the revelation of the airport's existence. Knowing about the airport would change how myself and others thought about globalization. It may surprise some readers to learn that, in addition to being from Maniema, my friend is also a local professor who has studied for his doctorate in Belgium. He claims direct, interpersonal experience with the village's witches and their international airport.

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The area around this village was once the agricultural breadbasket for all of Maniema, but most young men have left it to search for artisanal mining opportunities elsewhere, rather than trying their luck at farming while accumulating expenses and debts. These days, it is very difficult, if not impossible, for a person to make enough money from farming to get married and raise a family, let alone send children to school (there are many reasons for this, beyond the scope of this chapter). The poverty of the village is part of what makes the global importance and notoriety of the witchcraft airport so striking to people throughout the province. To paraphrase some residents, the town is amongst the poorest places in the world, but it leads the world in witchcraft, the opposite of "development." They say that things started to get out of control some years back when the senior male witches decided to flex their muscles by using their power to shut down agricultural production. People say they did this because witches are the enemies of development – they hate seeing others prosper. But as an outsider, it's hard for me not to interpret this as a story told by youth about the dangers of a town dominated by seniors, one that blames seniors and their control of land at a time when young men are responding to the pull of extractive industries. Their absence often lands them in conflict with their elders, and many certainly feel guilt and anxiety upon returning home.

A couple years back, the invisible airport was the site of a major international trade war following upon a period of mutually beneficial exchange in witchcraft technologies. According to locals, this airport had enabled the world's witches to break free of historical and geographical constraints by trading in different kinds of witchcraft. It soon became an instrument of market liberalization, and a principal site of convergence between European/American witchcraft and African witchcraft. As one man explained it, "You might have only bees, and I may have only snakes, but now we come together in exchange through the airport." According to the stories, foreign witchcraft was borrowed on loan for a period of time by people who also temporarily gave up their particular witchcraft technologies for others to use.

The trade war occurred because American and European witchcraft are more powerful than African witchcraft. The Americans and Europeans did not want to hand over their knowledge to Africans, but instead wanted to absorb the knowledge of their African counterparts, making it part of their own repertoire. Others placed the onus on the Africans who had borrowed the American/European witchcraft: they didn't want to return what they had borrowed, and this had started the war. While there was disagreement about these details, there was general consensus regarding the consequences: one of the European witches set off an occult "bomb" that impacted people in the visible world. Doctors working in local clinics reported having to treat patients with metal embedded in their bodies. Rumors about the event circulated throughout the region, building upon many other stories, particularly those concerning witches flying around in "witch-planes" – invisible vessels that, much to the embarrassment of their witch occupants, sometimes run out of fuel, leaving their often-naked passengers exposed in inopportune places.

As I mentioned above, my friend the professor had a personal experience with the witches of this area, a story that I also heard from others in the region who didn't know him at all. It happened when he was working for the United Nations just after the Second Congolese War (technically 1998–2003 but it still continues). He was in a helicopter with a Member of Parliament from the area, on their way to visit a refugee

camp, when they hit an invisible wall in the sky. The helicopter was immobilized and the pilot had no choice but to land. When they landed, they could find nothing wrong with the helicopter, and were eventually directed to an old man whom everyone knew to be the most powerful witch in the village. The senior proceeded to matter-of-factly tell the professor and the MP that he had brought the helicopter down because the MP had not been in to see his people in the village since having been elected to parliament. The old man wanted the MP to know who was really in charge, and that the rural countryside, his true home, had power even if it was poor. They were rich in other ways, and the MP could not afford to spend his life tacking back and forth between urban centers while ignoring his people and his ancestors. Such behavior was sure to have consequences.

Throughout much of the continent, witchcraft is a critical dimension of social reality, as real as politics and economics, from which it cannot be easily disentangled. And so it stands to reason that most cultural anthropologists who work in Africa have at some point been exposed to such stories, even if their work does not seem to directly concern witchcraft at first. But what is one to make of them? Should they be treated as simple statements of fact, as metaphors, or as something else? Do these stories represent a peculiarly African understanding of the world, or is there something universal about them? If they are universal, why do these particular ideas seem to be more widespread in Africa than in, say, the United States? Is witchcraft a "traditional" form of knowledge, or is it, as the above story suggests, so tied up in contemporary processes such as capitalism that it cannot be separated from them? And perhaps the most difficult question of all: is witchcraft actually "real" and what would the scholarly and social implications of that be?

These are complicated issues, largely beyond the scope of this chapter, but it is impossible to write about witchcraft without taking some stand on them, at least implicitly. For example, in the story of the international airport, I made certain choices regarding how to present the material. First was the choice of this particular case, which I made in part because it brings together the different scales at which discourse about witchcraft resonates in Africa. The story seems to have a point to make about the consequences of trade between unequal parties, and shows that less advantaged traders are vulnerable to violence at the hands of their more powerful counterparts, who try to control opportunities, timing, and reality for their own benefit. Also, the actors involved aren't from the village but from elsewhere, including the United States, so the story implicitly claims that witchcraft is not unique to Africa, while showing that my interlocutors use the concept to evaluate the intentions and actions of powerful foreigners. To offer social context, I provided some background about the economic history of the region and major social tensions, but I tried not to imply that I thought that concerns about trade or agriculture "caused" the belief in witchcraft or an international witchcraft airport. On the question of witchcraft's reality, I equivocated: I imply at one point that the airport exists, rather than saying that people believe it exists. I did this in part because I don't actually know whether it exists in reality and, even if it does not, the belief in the airport is real in effects. Even though I equivocate in this way, I tried to make it clear that these ideas are held by people, and so ultimately depend on consciousness for their reality. I also implied that there was translatability, and also a fair amount of tension, between English-language understandings of witchcraft and local terms, in that I used the term witchcraft and

then offered two Swahili terms in parentheses. Though I signaled them, I decided not to dwell on these differences, but to move on to the story and allow the substances of the material to emerge from there.

Anyone who writes about witchcraft is implicitly making choices about some or all of the above issues, which in this chapter I have grouped under the heading of four key problematics (see below). My choices reflect my own theoretical commitments and driving questions, while also responding to the concerns of people I have spoken with during fieldwork, primarily in Kenya and the Democratic Republic of Congo. As I will explain throughout this chapter, my commitments differ in certain respects from other anthropologists whose work engages with the dynamics and meanings of witchcraft in contemporary life throughout Africa. Moreover, I will also discuss ways in which the frameworks and questions that animate current anthropological debates and investigations of witchcraft both draw upon, yet also substantially differ from, those of earlier anthropologists who were influenced by the historical moments in which they worked and by broader currents of theory that held sway in the discipline at the time.

## A Brief Historical Orientation

Early Africanist anthropology was very concerned with understanding African witchcraft and its relationship to other aspects of African life (see, for example, Evans-Pritchard 1937). The main reason for this was that anthropologists had been engaged in a conversation about rationality and the extent to which there was any significant difference between so-called "modern" and "primitive" modes of reasoning. Since the early days of anthropology, "witchcraft" seemed to stand out as an obvious example of irrational, primitive belief whose existence demanded some kind of explanation (Frazer 1900; Malinowski 1935). The main reasons for this, I suspect, are (i) the specter of the early modern European and American witch hunts in the imaginations of Westerners, for whom witchcraft was and continues to be a sign of backward superstition and (ii) that witchcraft ideas suggested to others a lack of individuation on the part of "believers," because the beliefs implied that the emotions of others could determine one's life course.

"Armchair" evolutionist anthropologists like James Frazer viewed magic and witchcraft as "primitive" forms of scientific reasoning and of grappling with the nature of the cosmos. Subsequent generations of anthropologists – that is, those who did fieldwork – dropped many of the explicitly evolutionist assumptions of the earlier anthropology and instead sought to make sense of witchcraft within local cultural and political contexts. In the structural functionalist anthropology that dominated Africanist anthropology from the 1920s until the 1950s, anthropologists produced rich ethnographies of African witchcraft that dwelled heavily on local terminology while elaborating upon local systems of belief and practice (Beidelman 1963; Evans-Pritchard 1937; Krige 1947; La Fontaine 1963; Marwick 1964; Middleton 1963; Nadel 1935; Wilson 1951). Even then, the teleological assumptions of evolutionism never really went away, because witchcraft was understood to be a belief system and form of practice that was particularly relevant in "traditional societies," especially ones where kinship was believed to be the dominant mode of organizing society (as a side note, Peter Geschiere (1997) refers to witchcraft as the "dark side of kinship" without

suggesting there is anything "traditional" or "pre-modern" about kinship, which Marshall Sahlins calls the "mutuality of belonging.") As late as the early 1970s, Robin Horton distinguished between "closed" societies based on kinship and custom and "open" societies that valued education and new ideas while looking toward the future; according to him, accusations of witchcraft erupted when the dictates of custom, the putative equivalent of law for "closed societies," were abrogated (Horton 1967). And, despite the fact that Evans-Pritchard made much of the fact that witchcraft was no less rational than science (see below), the idea lingered that, because the concept of witchcraft was adapted to these "pre-modern" societies, they would vanish as capitalism and individualism vanquished earlier, traditional modes of being.

In the post-colonial period, studies of witchcraft fell by the wayside as anthropology focused instead on seemingly "modern" concerns like political economy, state governance, and rural-urban migration (although the Manchester school of anthropology had been studying these "modern" phenomena since the 1940s). Some expressed a concern that the subject was exoticizing and embarrassing, reflecting the interests and judgments that colonial-era Europeans had about Africa (see, for example, Mbiti 1969). More insidiously and perhaps more to the point, there was an implicit assumption that, now that these nation states were no longer under the grip of colonialism, they would follow a developmental trajectory similar to that which prevailed in the West. Again, as markets took over and people became individualistic, they would lose their belief in witchcraft, which was imagined to rest on a collectivist way of life and world view. But, starting in the 1990s, there was an explosion of witchcraft studies and revitalized analyses of witchcraft that have continued more or less unabated to this day. These studies have tended to argue for the "modernity" of witchcraft – its compatibility with contemporary institutions like capitalism and state governance (Ciekawy 1998, 2001; Ciekawy and Geschiere 1999; Comaroff and Comaroff 1993; Crais 2002; Geschiere 1997; Moore and Sanders 2003); sometimes witchcraft is understood as offering a critique of capitalism, the abuse of power by elites, and the accumulation of wealth without "sweat" (Ferguson 2006). Having been present when some of these conversations were taking place, I can offer that there were two underlying factors shaping this resurgence. First, it became obvious that African witchcraft practices were not fading away, and that both accusations and rumors seemed to be expanding (although we acknowledged at the time that this was impossible to measure). Second, once people accepted the idea of vernacular or alternative modernities, it became possible to think of witchcraft as "modern" and therefore a legitimate object of study for anthropologists, who had by then recast themselves as students of conflict and transformation rather than custom. This fed a renewed interest, and an expansive re-reading of, Evans-Pritchard's analysis of alternative rationalities as they emerge in Azande occult practices (see below).

It is important to realize that the Africanist anthropological literature on witchcraft is vast, being one of the subjects that captured the attention of the discipline's earliest practitioners in Africa, and which has been reckoned with continuously ever since. It is therefore virtually impossible to capture every line of thought or debate in an overview chapter such as this one. Instead, I have opted to organize a discussion of how anthropological thinking about witchcraft in Africa has changed and about the current state of debate in the field, through the lens of five problematics. In my view, these five problematics are not only crucial ones with which contemporary anthropologists

must wrestle in their efforts to theorize and understand witchcraft as an aspect of social existence throughout much of Africa, but they also represent questions that earlier anthropologists grappled with, and through which an analysis of shifts in the focus and theoretical treatment of witchcraft by Africanist anthropology can be discussed. I also include in this list problematics/themes that may inform possible future anthropological querying on the subject – introducing some of my own thinking in progress in the process. The problematics include (i) Definitions, in which I focus on the common use of the English term witchcraft to describe African practices and ideas, (ii) Differences, in which I discuss the divergence in scholarly representations of European and African witchcraft, and point to the relationship between capitalism and witchcraft, and (iii) Decisions, in which I clarify anthropology's implicit take on the reality of witchcraft, and suggest why this is important, and (iv) Dreams, in which I engage Monica Wilson's concept of the socially standardized nightmare, and (v) Directions, in which I discuss the significance of space-time, and propose that anthropologists direct their attention to the temporality of witchcraft.

## Definitions: What's in a name?

The first problematic concerns the English word "witchcraft" itself – what exactly does it refer to, and why use a historically and symbolically loaded English term to describe this phenomenon in the first place? There is a long history of debate about this, going back at least 100 years. Most influentially, in *Oracles, Witchcraft, and Magic*, E. Evans-Pritchard distinguished between witchcraft and sorcery in Azandeland based on his interpretation of Azande concepts: sorcery was a learned practice involving the use of spells, rituals, or medicines with the intent of causing harm (Evans-Pritchard 1937). In contrast, witchcraft was a substance in the body that could fly around at night and harm people regardless of the witch's intentions or conscious knowledge; therefore, for Azande it was possible to be a witch and not realize it. At the root of this distinction was something like the modern Western dichotomy of religion and science: ideas about witchcraft were meaningful beliefs that were integrated into a larger social political order that was also meaningfully constituted, whereas sorcery was instrumental action. Despite its particularity to Azande and the fact that it is clearly rooted in Western assumptions, the distinction was so influential that for many decades people clung to it, as if there was something sacred about these terms (for example, before I went to conduct fieldwork in the Taita Hills, Kenya, an anthropologist who had worked there in the early 1950s admonished me for using the term witchcraft to describe Taita ritual practices: Wataita had sorcery, she told me, not witchcraft). On the other end of the spectrum, colonial-era missionaries and administrative authorities tended to see all African cultural practices as witchcraft, and used the word accordingly; see, for example, the Kenya Witchcraft Act, which implies that many cultural practices, including divination, are witchcraft (Luongo 2011). Ironically, the colonial use of the label witchcraft has probably been more influential than whatever anthropologists have had to say about it. As I mention below, Africans' continued usage of the term, inherited from colonial and post-colonial history, is one of the most obvious and compelling reasons for anthropologists' continued use of the term "witchcraft," in addition to co-existing local ones.

These debates about terminology have continued, dwelling mainly on whether or not it would be better to use African terms because the English term fails to capture local nuances and is overly generic (Crick 1979). Moreover, the English word "witchcraft" is associated with the scapegoating of women, and most African witches are male. Others have argued that the term is demonizing, and that the practices that fall under the heading of witchcraft should be thought of as religion (see, for example, the debate between Ranger 2007 and Ellis and Ter Haar 2009, discussed at length in Geschiere 2013). This is not, in my experience, the position that African themselves take when they define witchcraft as destructive and worldy, in contrast to religion. I have never heard anyone in Africa argue that witchcraft is religion.

For me, the best reason for *not* using the term witchcraft is that it implies mystical or occult activity, which is not actually what defines witchcraft for the people with whom I work. For example, when I did my fieldwork in the Taita Hills, a person tampering with irrigation canals so that the water flowed away from his mother's brother's compound and into his own was said to have engaged in witchcraft when he snuck out at night to divert the water. Similarly, a woman who trampled her neighbor's maize stalks, also at night, was found guilty of witchcraft in a local tribunal – the secretive and destructive nature of her act, which affected close neighbors who were also kin, is what made it witchcraft. She was allegedly drawing collective value in the form of water away from people she was supposed to love, and consuming it herself, privately. So, what made a particular act witchcraft were the intentions and affects that motivated it, its value potential (destructive to others rather than generative), and its invisibility. Witchcraft was destructive action, and magic that actually produced the collective good was generally not considered witchcraft (although Pentecostals argued that, since ancestors were actually demons, all ritual action directed at them was satanic). To be sure, powerful witches could manipulate space and time in profoundly magical ways, but that was not what defined the acts as witchcraft.

On the other hand, it seems to me that the main justification for continuing to use the term is that Africans are aware of it and use this or other European terms to reference specific practices. When they use such terms, they often appropriate parts of the European understanding of witchcraft into their understandings, and work to subtly change African and Europeans understandings alike. For example, the idea that witchcraft is related to Satanism and Satan worship has become more widespread in Africa as the result of Pentecostalism, and its users want that whole history to resonate through their use of the English term.

Perhaps more importantly, in deploying this term, Africans also signal that witchcraft is a global threat not limited to Africa. This reflects the fact that many Africans understand the concepts, practices, and behaviors that epitomize "development" in the West—from individualism to the privatization and expropriation of land—to be forms and/or engines of witchcraft. In Kenya, preachers and pundits regularly opined that World Bank orchestrated structural adjustment programs were part of an international conspiracy of devil worshippers who wanted to create Satan's kingdom on earth by increasing the misery of the poor and cutting the funds for education – the currency of modernization and the "light" that vanquishes darkness. Kenyans were clear about the fact that the international cult of devil worshippers, said to include prominent politicians, international bankers, and celebrities, was a form of witchcraft – though very different from the witchcraft that they were historically accustomed to (see also Ferguson 2006).

## Differences: Witchcraft Concepts as a Force for Good or Evil?

One of the things that distinguishes Africanist scholarship on witchcraft is its focus on what could be considered the more positive dimensions of witchcraft ideas and practices, specifically two: (i) especially in older, structural functionalist ethnography, the emphasis on maintaining social and cosmological order and (ii), in more recent ethnographies, witchcraft as a critical commentary on, and even a practical impediment to, the excesses of post-colonial capitalism and the violence of everyday life; for some, witchcraft can be read as a popular cultural critique not unrelated to other cultural critiques, such as Marxism.

As mentioned above, the specter of early modern European witchcraft and witch hunts continues to haunt the Western imagination as a sign of irrational persecution of the weak or marginalized. For historians, the so-called early modern period is a time when diverse ritual practices and concepts came to be relexified as satanic, and a hegemony of religious thought and centralized state power persecuted women in the name of witchcraft (Ginzburg 2004; MacFarlane 1970; Thomas 1971). For example, in *Caliban and the Witch* (2005), a brilliant recent Marxist-feminist analysis, Silvia Federici shows how the early modern witch hunts constituted a war against women's work that led to the destruction of the household as a center of economic production and the violent dispossession of a future proletariat. She sees the state-centered assault on the household as critical to the development of modern capitalism, as well as the Foucauldian disciplinary state, and argues that there was a thoroughly rational logic at work in what she describes, in Marxian terms, as a process of accumulation by dispossession.

In rather sharp contrast, the anthropology of African witchcraft has tended to focus on what could be called, somewhat argumentatively, more "positive" dimensions of this concept and the practices around it. For the most part, this represents the stance of advocacy that anthropologists have tended to assume with respect to the people with whom they work (to be sure, some have seen in this stance an imperial paternalism, especially given that the defense of local custom, and the idea of absolute difference, was central to colonial indirect governance). During colonialism, anthropologists made a case for the rationality of African concepts and practices that were denounced as backward and even savage by colonial authorities, especially missionaries.

The first, and still one of the very best, arguments for the "rationality" of witchcraft is the British anthropologist E. Evans-Pritchard's *Oracles, Witchcraft, and Magic among the Azande* (the Azande occupy what is now Southern Sudan as well as the Democratic Republic of Congo). Evans-Pritchard famously argued that Azande witchcraft concepts and the practices related to them were rational in two major senses – one epistemological and the other sociological. Epistemologically, Azande ideas about witchcraft were compatible with science, Evans-Pritchard argued, because they did not contradict empirical evidence. Rather, Azande witchcraft ideas went beyond the "how" questions of science and posed "why" questions that science was incapable of answering. Evans-Pritchard gave the example of an Azande man who died because a granary collapsed on his head. The granary was eaten away by termites, so it would seem that termites caused the granary to fall. But Evans-Pritchard's Azande informants insisted that this putative accident was in fact a witchcraft attack, and so called for divination to determine the perpetrator. They made it clear that,

while they understood that the granary had been consumed by termites, this alone could not explain why the structure fell on that particular person's head at that particular time. The accusation of witchcraft implicitly posed the question "why," and responded with a social explanation, which Azande ritual was capable of addressing and resolving.

Evans-Pritchard concluded that witchcraft offered a social – rather than a remote and asocial – explanation for misfortune, exceeding Western science without being inimical to it. He went on to argue that, because it comprised a logical system, witchcraft was invulnerable to argumentative attacks from outside the terms of the system (say, through the idioms of education and science). The implication of this logic is that it is entirely possible for a Western-educated African with a background in science to "believe" in witchcraft as an explanation for misfortune. In the same vein, it is consistent for someone to hold that a person has contracted the HIV virus through sexual contact, but that another person has nonetheless made the disease manifest as AIDS.

In addition to this epistemological rationality, Evans-Pritchard argued, witchcraft was also rational in a sociological sense, in that the belief in witchcraft helped to generate the social good as Azande understood it, or as Evans-Pritchard understood Azande to understand it. Another way to put this, using the anthropological language of the time, is that witchcraft was socially functional. This sociological rationality had two major dimensions. The first was that witchcraft accusations tended not to upend the social order, as Azande royalty were immune to accusations from commoners (it is telling that Evans-Pritchard viewed this as evidence of social cohesion rather than the hegemony of one class of Azande over another, as it implies that he saw the integration of the system as an intrinsic good regardless of its historicity, and regardless of how marginalized individuals within the system interpreted it). The second, and I think more persuasive component of this argument, is that the process of witch-finding through divination culminated in the airing of grievances that might otherwise have led to actual social conflict or cleavage. Azande society was cut through with complex interdependencies related to their particular form of social organization (read here as kinship and marriage), which afforded many opportunities to offend and be offended. Witchcraft thus served as a kind of release valve, while also disciplining asocial behavior (e.g., selfish rapacity) in the absence of strong regulating institutions like states.

One of Evans-Pritchard's points seemed to be that the airing of grievances led to actual social interventions, made through the mediation of the oracle, and that this ameliorated conflicts over time. Later anthropological studies, notably those of Max Marwick (1964), made much of this aspect of Evans-Pritchard's argument. Marwick argued that witchcraft accusations were "social strain gauges" that served a function in small-scale societies by fostering cohesion and catalyzing social fragmentation when it was needed – perhaps for ecological reasons. For these thinkers, witchcraft was socially functional in that it further cemented the particular social structure that made life make sense to culture bearers.

Relatively recent work on witchcraft has extended Evans-Pritchard's observation that "witchcraft is a social explanation for misfortune" by broadening our understanding of the social to include capitalism, urbanization, "state-society" interactions, and Africa's engagement with the "international community" broadly conceived. Some of these analyses claim that witchcraft discourse draws upon the cultural values

that are inscribed in kinship based systems of reciprocity to launch an implicit critique of capitalism's abuses and inequalities (Geschiere 1997; Moore and Sanders 2003; Comaroff and Comaroff 1993). Others claim that local discourse about witchcraft simply captures the workings of power and capitalism exceptionally well, articulating truths that normative Western discourse often misses. For example, John and Jean Comaroff (1999) argued that contemporary casino capitalism is itself an occult economy. The inscrutable and magical nature of contemporary capitalism, in which wealth seems to be produced through numbers and labor is rendered invisible, can best be understood and acted upon through recourse to magic. In *The Modernity of Witchcraft* (1997), Peter Geschiere showed how the affects associated with witchcraft – jealousy and greed in particular – were exacerbated by tensions between urban elites and rural villagers. In broadening the scale and definiton of the social, some anthropologists have also pointed to the long history of Africa's engagement with the West, arguing that certain occult ideas originated in the violence and persecution of the slave trade (Austen 1993; Shaw 2002) and consist in an ongoing engagement with accumulation by dispossession. Others have shed more light on the contemporary, showing how the traumatic restructuring brought about by neoliberalism and the decline of authoritarian states generated new waves of witchcraft, as people searched for the enemy within, while gendered and generational conflicts became more extreme (Ashforth 2005; Smith 2008).

In this genre of work, ideas about witchcraft sometimes come to resemble social theory. And while it may seem like a superimposition of Western concepts onto Africa, many African ideas about witchcraft and/or the occult can sometimes read as if they were straight-up Marxist critique rendered in a different idiom (certainly the widespread rumors about zombie laborers working for the rich without their knowledge have that flavor). Take, for example, the rumors that spread about majini spirit familiars in the Taita Hills during the 1990s (Smith 2001). According to these stories, migrant laborers in Mombasa purchased spirit familiars called majini (from the Arabic jinn) from Muslim merchants there. The majini, who live in another dimension with a social hierarchy that resembles that of human society, provided their "owners" with cash and other luxury commodities in exchange for regular blood sacrifice – of chickens, cows, and ultimately people. Majini consumed the blood invisibly, spiritually, causing problems like wasting and sometimes insanity in the consumed victim over a period of time. People in Taita were very concerned about the scourge of majini, in part because they were so accessible: anybody with money could buy them, and so they were a new, liberalized form of witchcraft (not inherited or learned like earlier forms of witchcraft). Whether they were "real" or not, majini indexed all the concerns people had about money and market liberalization in general, such as the dangers of selling land and livestock that actually belonged to larger groups of people, as well as ancestors (see also Shipton 2009).

In sum, anthropology has drawn attention to the imaginative dimensions of African witchcraft ideas and practices, allowing them to be seen as a mode of critical engagement with the world. The differences between Africanist and Europeanist studies of witchcraft reflect the divergent social and historical contexts of these ideas and accusations, while also drawing attention to the collaborative relationship that anthropologists, and Africanist anthropologists in particular, have with their interlocutors. Nonetheless, it can be productive for Africanists to be informed by the insights of studies of European witchcraft, which have focused on the often- sinister implications

and consequences of witchcraft ideas and practices, and how they respond to new historical contingencies. This would include how witchcraft ideas get appropriated by state authorities and put to work for particular projects. (For example, Jane Saffitz (2019) has written about the targeting of "traditional" healers as witches in Tanzania, while James Smith (2011) discusses the criminalization of unemployed urban youth branded as devil worshippers in Nairobi).

All of this raises a question: Does the fact that witchcraft ideas engage critically with social reality imply that they are not real? Does this matter, and what are the implications for ethnographies of witchcraft?

## Decisions: Are Witches Real?

Coming to terms with this question, and recognizing that most social science has implicitly answered it with a "no," is important for understanding both the anthropology of witchcraft, and reactions to it, especially amongst Africans themselves (for an insightful and in-depth discussion of these issues see West 2005, 2007). To put it succinctly, anthropological analysis tends to proceed as if witches do not exist and are not actually bewitching people – or at least that they would not be able to if they indeed tried to do so. In *OWM*, Evans-Pritchard was bald faced about witchcraft's non-reality when he wrote that, "witches, as Azande understand them, clearly cannot exist." To be fair, elsewhere in the text he equivocates, admitting to having seen unexplainable lights that his Azande informants knew to be witchcraft traveling in search of a victim. These days, I know of few anthropologists who are willing to own up to the paternalism necessary to blatantly claim that witchcraft does not exist. But we usually understand popular concerns about witches to be broadly metaphoric, or perhaps metonymic, of other concerns that are personified in alleged witches (which of course does not mean they are not also real).

There is, in short, a major disconnect between anthropological interpretations of African witchcraft and African experiences of them. Much of this is explained by the fact that anthropologists generally narrate stories they hear about witchcraft, so of necessity they are dealing in other peoples' representations of reality. Our interlocutors sometimes confront us on this, insisting that these are not just stories, but things that are actually happening (bringing to mind the famous scene in *Rosemary's Baby:* "This is not a dream! This is really happening!"). Witchcraft is simply real, just like parliamentary politics, family disputes over property borders, soccer games, and car accidents – all of which are often saturated in witchcraft and witchcraft accusations. My friend whose helicopter was brought down certainly "knew" that a witch had accomplished the feat, for he had felt the wall when they hit it and had spoken to the witch afterwards, who admitted to having performed the act. For my friend, this event was meaningful not because of what it represented, but because it showed him that even a powerful politician and a PhD candidate who speaks French better than the French and knows Brussels like the back of his hand could be forced down to the ground and back to the village by a powerful, scorned witch. The witch may be physically weak and hopelessly poor, but that is no matter in the world of witchcraft. Of course, even for him, this communicated other things beyond that fact itself, and so had an indexical dimension that exceeded its reality.

Only a small handful of texts have even posed questions like "What would it mean if witches were in fact real?" Notable among them is Paul Stoller and Cheryl Olkes's book, *In Sorcery's Shadow* (1987), in which Stoller narrates his efforts to master Songhay sorcery and magic, and the ethical and epistemological problems that resulted (see also West 2005). Adam Ashforth, in his ethnography of the ubiquity of witchcraft in post-apartheid South Africa, makes a clear case for owning and clarifying one's stance on the reality of witchcraft (Ashforth 2005). As he puts it, if the international community actually believed in witchcraft, or knew it to be true, then the news (rather than "rumor") that some people are murdering other people through sorcery in South Africa would demand an international intervention. Instead, there are interventions aimed at protecting witches, which means that the international community is on the side of witches (assuming, again, that witches are just witches, and not personifications of fears). In a similar vein, my friends in the DRC are certainly speaking from within the "ontology" of witchcraft when they say that I should do research in the village that hosts the international witchcraft airport so that North American witches will know that a community of international scholars are on to them.

And yet, witchcraft is unlike other "beliefs," such as the efficacy of rainmaking or the idea of God, in that alleged witches are social actors who occupy specific positions in society, as men or women, rich or poor, rural or urban, young or aged. This means that rumors and accusations regarding them also entail accusations about a social class, or a way of living. My own feeling is that this alone shows the alleged difference between "reality" and "metaphor" to rely on a false dichotomy, because the rumors and accusations have visible social referents. Moreover, everything people do is symbolically constituted and all representations are parts of a larger web of signification through which the world is made meaningful to subjects operating in it. It may be that majini spirits are actually out there in the world, eating the blood of car accident victims and making parents' favorite children insane in exchange for cash gifts. Nonetheless, they also signify. In consuming blood, majini consume everything that Taita associate with blood – including kinship, and the ability to reproduce kin relations through the exchange of livestock and the birthing of children. The fact that majini come from the city means that they also represent the dangers of rural-urban migration, something Wataita depend on in order to survive, especially as they continue to destroy their ecology while being denied permission to expand into neighboring Tsavo National Park. And on and on: they produce illusory value; there is a gendered dimension to the rumors; the places where they attack are also symbolically constituted (roads, schools). Therefore, it is possible to understand something about Taita experiences of and perspectives on the visible world through majini, regardless of whether or not they exist, and there's probably no reason for an anthropologist who wants to understand the former (a perfectly legitimate endeavor) to make any judgments about the latter.

Similar things could be said for the first story I presented, concerning the international airport for witchcraft in Maniema. Regardless of whether or not the airport really exists, the story signifies something about people's experiences and perception. There, the main issues include the conflict between agriculture and mining, the international demand for Congolese mineral value, and the historic power of neglected places that are widely understood to be "behind" in time. For my friend telling the story, there was also the tragedy of living in a society in which illiterate people could

bring down the most developed *evolues*, thus making a mockery of the value of education and urban cosmopolitanism.

To sum up thus far, in stories about witchcraft we are dealing with processes that are at once real and imaginary. They create boundaries, identifying certain people as beyond the pale, and this process can be violent and destructive. But they also look beyond social boundaries, penetrating into the secret workings of power and making sense of the world in innovative ways that can be potentially transformative. These ideas are metaphoric, but they are experienced as real, and concepts and stories about them are translations of real experiences people have. They make sense of the world in terms that cannot be refuted, and which exceed the limits of "Western" knowledge (West 2005, 2007). Whether they are literally true is a more complicated matter, probably impossible to know. While most anthropological discourse has seemed to proceed is if they are not, there is no necessary reason why an analysis cannot be anthropological and still leave open a space for witchcraft to exist. Much of this comes down to writing and the conceptualization that is built into writing, as I pointed out earlier.

None of which necessarily helps us to explain why these ideas, or realities, are particularly prominent in Africa. Here again, an earlier generation of anthropology provides an opening. I want to begin with the concept of the standardized nightmare, before going on to discuss the temporality of witchcraft.

## Dreams: The Socially Standardized Nightmare

The term "standardized nightmare" comes from Monica Wilson, who worked in Tanzania in the 1920 and 1930s, and who referred to witchcraft as the "standardized nightmare of a group" (Wilson 1951). The implication was that all groups have standardized nightmares that reflect their particular collective anxieties at a given moment in time. The nightmare is typically an inversion of group ideology, or the stories people tell themselves about what they are like when they are at their best, or what they potentially could be. According to this concept, witchcraft ideas are prominent in Africa because they reflect how people imagine threats to their society and the kinds of society they think they should be creating through their actions (for example, one in which people share with one another openly and witchcraft is inconceivable). Following Nancy Munn (1990), we can also refer to this in terms of value potential – that certain kinds of action allow for varying amounts of negative or positive value, and witches represent the extreme negative pole of action. In other words, when Africans are talking about witchcraft they are projecting their worst, most apocalyptic, fears about the world, and these fears are usually somehow an inversion of what they imagine the good life to be. So, witches are the negative potential value of a system predicated on kin supporting one another. The close proximity that kinship affords, most iconically in acts of collective eating, means that the relations and attitudes that are supposed to assist can also become vehicles for the sabotage of the whole society. The witch poisons food and people begin to die.

The idea of the standardized nightmare is loosely functionalist, in that these rumors are deemed to have some kind of purpose in relation to the life of the group – they remind people of their core values by providing an oppositional representation, a foil,

against which these anxieties become tangible and real. But they are not functionalist in the "classic" sense of the term: because standardized nightmares change in relation to contingent events, they do not serve to reproduce an unchanging social order, but are honed always to the new and emergent. Finally, because all societies have standardized nightmares (just different ones), it is impossible to judge them as better or worse, real or less real. Another implication of this theory is that the reason witchcraft ideas do not dominate in North American society is that they do not reflect the anxieties that our society generates as negative value potential. A more typically American standardized nightmare is that of the non-white, foreign terrorist, a religiously motivated agent who allegedly hates the United States – perhaps because of its putative freedoms, perhaps because of the hypocrisy of its stated values when compared to its actual foreign policy (see also Comaroff 1997). The terrorist uses the currencies of U.S. hegemony – free trade (the World Trade Center) and control over space-time (airplanes and airports) – to destroy the republic from within and without. In the United States, anxiety about Islamic terrorists, in particular, has always been astronomically out of proportion with the threat they represent in relation to such dangers as automobile accidents. Question: Why don't we ban cars if they're more dangerous than "terrorists"? Answer: because cars are iconic of the American dream of mobile autonomy, regardless of the fact that the pollution they produce may destroy the conditions of possibility for a viable future (the same could be said for steak, which as of now is a socially standardized nightmare for only a relatively small group of people).

One could easily continue in this vein: Haunted houses reflect the disconnect between the exchange value and use value of real estate in U.S. society. Regardless of the money spent and the papers signed, can one ever be said to own an object built and lived in by others and saturated with their memories (which probably explains the demand for new and renovated homes)? Stories of alien invasion, abduction, and experiments on humans reflect an awareness of the history of U.S. empire, projecting this history onto the intentions of extraterrestrial others. They also reflect growing awareness of the dangers of a technologically based society that seems to be becoming less embodied (the extraterrestrials often have big heads, weak limbs, and little or no genitalia, and sometimes seem to be looking for ways to reproduce because they can no longer do so).

Again, to call something a standardized nightmare doesn't mean that it is not real. Terrorists are real, as are child molesters and possibly haunted houses and extraterrestrials, but they are also standardized nightmares reflecting fears about possible attacks to the nation, the family, the sacred innocence of childhood, and the human species.

## Directions: Witches and Temporality

I want to close this chapter by returning to Africanist work on witchcraft and suggesting that anthropologists pay closer attention to the temporalities of witchcraft. Some anthropologists have seized upon the fact that witches manipulate space-time and have built on that insight to consider witchcraft as a mode of spatio-temporal action, thereby avoiding the reduction of witchcraft to specific social referents in the world (kinship or capitalism, for example). This idea was first expanded upon by Nancy Munn in her work on witchcraft in Gawa (Melanesia), in which she argued that

witches produced the negative transformation of value in space-time (Munn 1990). Since then, a number of anthropologists have drawn attention to the importance of social-spatial boundaries in witchcraft accusations. Most notably, Peter Geschiere has argued that witchcraft, whether African or European, tends to emanate from within a group of kin or neighbors who are proximal, and so witchcraft accusations focus on protecting against threats from within (Geschiere 2013; Nyamnjoh 1998, also Austen 1993). While anthropologists have drawn attention to how witchcraft relates to the creation and collapse of social space, it has been less common to focus on time and temporality.

While social boundaries emerge in many discussions about the sources of witchcraft attacks, temporality suffuses the way people in the field sites that I am familiar with talk about the experience and consequences of bewitchment. Throughout the continent, witchcraft is said to tie or close off people's life prospects and futures, making it so events don't proceed in the way they were expected to, thus sabotaging promising futures. In addition, witchcraft is widely understood as having been inherited from the past – historic grudges or the clinging demands of kinship ties to people one may not know, care for, or relate to personally (especially dead kin, who may continue to curse one's life after one is dead). In a contemporary global context in which many people compare their prospects with those that they imagine exist in other places – locations they know about because of media and the Internet – this feeling of being stuck in time is further accentuated (Smith and Ngeti 2014). Moreover, in many places, witchcraft has long been connected to what I have referred to elsewhere as colonial and post-colonial tempo-politics (Smith 2008): African elites and state leaders blame the populace for not being able to develop over time because they are enmired in witchcraft (resentments from the past, harbored over time). Meanwhile, ordinary people argue that elites contribute to a situation in which life is out of sync, or tempo: some things are moving too quickly (heart rate and circulation of blood through the body, or the movement of people back and forth between country and city) and others are moving too slowly (the time at which people are able to marry, or the time that it takes to get from one place to another because of the state of the roads). The lack of control over spatio-temporal process is symptomatic of other people's witchcraft attacks and creates the conditions in which witchcraft can flourish (Smith 2008).

For the alleged witch, the practice of witchcraft offers an escape from temporal blockage by imploding and collapsing ordinary temporal barriers; hence the focus, in so many witchcraft stories, on rapid wealth accumulation and invisible airplanes that travel far faster than actual airplanes. Always, this rapid change happens through the destruction of the means for producing incremental, sustainable progress or development. In some cases, people make a contract to receive wealth quickly (say in the form of diamonds) but only get to enjoy it for a few years, before they die. More commonly, they have to sacrifice favorite loved ones – spouses, children, parents. Very often, they have to give up incrementally generative household resources like livestock and chickens, which realize their value for others slowly, over time.

Efforts to untie oneself from witchcraft, whether through witch hunting or Pentecostal conversion, are thus efforts to remake society and the self, often with a view to how people are imagined to relate to one another in other, more "developed" places. What is useful about this kind of analysis is that it shows witchcraft ideas to emerge directly from the conditions in which Africans find themselves today without

implying that those circumstances have been misunderstood. In this view, witchcraft and counter-witchcraft are not so much local preoccupations as they are practical modes of engagement with the world shaped by a particular experience of being in it.

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