

## 4 What's in a genome? Indigenous encounters

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By rendering obsolete the theoretical opposition of nature and culture, the study of the human genome has given rise to fresh networks among anthropologists and other scholars. These developments, in turn, invite a refashioning of anthropology. While anthropology has often been divided on the issue of genomic research (Marks 2001, Lock 2005), with the conflation of nature and culture in the wake of assisted-reproduction technologies (Strathern 1990), molecular genetics (Rabinow 1996), and the conceptual, technical, and institutional developments associated with the recent Human Genome Project, a fresh network of associations has been emerging among anthropologists studying the human genome. These developments invite interesting and pressing questions: How do analyses and conclusions about genomic variation and history generated through laboratory work relate to local notions of subjectivity, belonging, and relatedness? What kind of relations between researchers and the people providing ethnographic and genetic information (formerly “informants” or “sample donors”) should one opt for?

Comparative research on the human genome has a complex history. In the early 1990s, the Human Genome Diversity Project (HGDP) was organized to explore human differences and history by sampling fragments of the genome from a number of populations across the globe. An early critic of the HGDP was Donna Haraway. While she remained “sympathetic to the desire to produce a human species database that draws from as large a concept of humanity as possible,” she suggested that the project’s notions of difference, representation, and agency got “its well-meaning organizers into well-deserved trouble” (Haraway 1996: 353). To Haraway (1996: 353), the main problem was the absence of any formative role or partnership for the indigenous communities: “The people to be sampled . . . were not regarded as partners in knowledge production who might have ends and meanings of their own in such an undertaking.” During the more recent El Dorado scandal, the anthropological community was forced to take direct measures to avoid similar troubles in the future.

Here I use the term “genomic anthropology” to denote a hybrid field that increasingly involves anthropologists in the fusion of the “social” and the “biological” in the wake of genomic studies. Unfortunately, “biology” has colonized and narrowed the broad Greek notion of *bios*. Crawford’s (2007: 79) characterization of “anthropological genetics” (in contrast to “human genetics”) in terms of “its emphasis on smaller, reproductively isolated, non-Western populations” similarly seems too narrow and archaic, given the variety of roles that anthropologists are playing in genomic fields. Extending arguments originally developed by critical ethnography and feminist studies with respect to ethnography (see Lassiter 2005), I suggest that it is important to explore the implications of collaborative genomic research in which subjects become consultants and even co-researchers. Such an approach has its own problems, but it may allow for responsible practice and sensitivity to local concepts and relations, both of which are central for postcolonial anthropology.

Research in the Arctic – the northern rim of eastern Siberia, Alaska, the Canadian North, and Greenland – illuminates the possibility and the complexity of exploring the genomic trajectories of the past in a collaborative fashion while also drawing on other approaches, including archaeology, linguistics, and ethnography (Bellwood 2001, Jones 2003, Stern and Stevenson 2006). My discussion is partly framed by anthropological research among the Inuit, especially the Inuit Genetic History Project (IGHP) that I organized with Agnar Helgason (see Helgason *et al.* 2006). In a collaborative approach that conflates nature with culture and expert with lay knowledge, a central challenge for genomic anthropology is to engage with the intellectual theories of the people encountered in the field.

Until recently, the prehistory of the Inuit (a brief chapter in the long and complex history of the species) has been an underexplored area in research on human genetics and variation. Thanks to advances and collaboration in several fields, the charting of this history is now a realistic goal. Although on their own genes may not determine who we are or what happens to us, historical information on what Oyama (2000: 161) refers to as “developmental state” is necessarily embodied in the genome: “Developmental state is a kind of temporal slice through the life cycle. It carries the evidence of past gene transcriptions, mechanical influences inside and outside the organism, results of past activities, nutrition or the lack of it, and so on.” The study of Inuit history can be significantly advanced through genomic analyses complementing and qualifying analyses of material remains, myth, and languages. While it is useful to explore the extent to which changes in genome, culture, and language go together, “the possibility of any 1:1:1 correlation between a gene pool, a culture, and a language, each changing only by internal variation of inherited source materials, can be dismissed right from the start” (Bellwood 2001: 201).

## 4.1 Inuit contexts

The early “zoning” of the earth into regions or cultures underlined Western ideas about cultural differences and the exotic. Thus, the “Arctic” (along with the “Tropics”) often served as a mirror for the temperate “West,” highlighting differences in climate, vegetation, and health. The Arctic, indeed, has been an important site for alterity (Hastrup 2007). The heroic search for the elusive Northwest Passage between the North Atlantic and the Pacific captured the imagination of Europeans for centuries. Occasionally, Inuit travelers and explorers have returned the gaze from a position radically different from those of Europeans in the emerging world system, with its hierarchy of identities, nations, and populations. Capitalizing on the popular imagination, by the end of the nineteenth century anthropologists and explorers collaborated in turning Eskimo culture into a museum piece for the pleasure and curiosity of the Euro-American public. Sometimes the Inuit themselves served as living specimens, one example being the Colonial Exhibit in Copenhagen in 1905.

At the beginning of the twentieth century, after a series of ethnographic expeditions, including those of Boas, Knut Rasmussen, and Vilhjalmur Stefansson, the Inuit became a staple of anthropological discussion. The physical and biological anthropology of the Arctic was also a twentieth-century development. While the first anthropological description of a Greenlandic skull by J.B. Winslow in 1722 generated speculation about Inuit origins and history, systematic physical measurements developed only during the first half of the twentieth century. Followers of the American tradition of Boas and Hrdlička showed “an almost fanatic devotion to measuring skulls” (Scott *et al.* 2000: 347), publishing detailed catalogs with thousands of measurements. With the modern synthetic theory of evolution that took shape in the 1940s, there was a sharp break with past emphases in biological anthropological research, in the Arctic as elsewhere, from physical measurements and race to studies of gene frequencies and populations.

Early debates on Inuit origins, migrations, and history were highly speculative, drawing on limited linguistic, mythological, and archaeological data and unreliable methods of dating. Steensby suggested in 1917 that the “dispute is old, and can still be said to be far from being finally decided” (1917: 41). By then, attempts had been made to establish Inuit origins on no fewer than three continents: Europe, Asia, and North America. The thesis of European origins rested on discoveries in the river basins and caves of northern France of Paleolithic bone implements that called to mind Eskimo artefacts. Writing in 1910, Boas discounted the European and Asian theses, opting for the Hudson Bay area of North America: “The much-discussed theory of the Asiatic origins of the Eskimo must be entirely abandoned. The investigations of the Jessup North Pacific Expedition [1897–1902], which it was my privilege to conduct,

seem to show that the Eskimo must be considered as, comparatively speaking, new arrivals in Alaska, which they reached coming from the east" (Boas 1940: 337).

Although based on the results of an important expedition, Boas's thesis was embarrassingly off the mark. The broad outlines of early human migration in the Arctic have now been fairly firmly established; Damas's (1984) landmark handbook on the Arctic assembles the available evidence. More recently, a systematic synthesis of archaeological, linguistic, and genetic results has emerged (see, for example, Ames and Maschner 1999 and Fortescue 1997 for the Northwest Coast and Greenland, respectively). Doug Jones points out, partly with reference to the Arctic, that during the past decade or two an "emerging synthesis" based on correlations in the distributions of genetic, linguistic, and archaeological variation has gained increasing popularity in the study of prehistory. Thus, "Eskimo-Aleuts and Northern Na Dene are clearly separate from the remainder of New World populations, with distinctive gene frequencies and language families" (Jones 2003: 510). This approach echoes a general trend emphasizing that "increased knowledge and understanding will only come from careful multidisciplinary considerations of many strands of evidence . . . This observation applies to archaeologists, linguists, paleoanthropologists and geneticists alike" (Bellwood 2001: 201).

Early theorizing on human settlement in the North American Arctic often assumed that the Inuit had lived unspoiled from time immemorial in isolated groups in practically the same location. Recently, a different narrative emphasizing the historicity and complexity of Inuit contexts has been gaining force. Throughout much of their history, the Inuit seem to have been dispersed in numerous, flexible, and mobile "*miut*" groups (that is, "the people of," for example, Killirmiut, Nunavummiut). It was only in the wake of the indigenous movements during the 1970s and 1980s that the people we now identify with the monolithic labels "Inuit" and "Eskimo" began to see themselves as a "people" or "nation."

The prehistory of human settlement of the North American Arctic is highly complex. Maxwell (1980: 161) suggested of his thorough attempt to provide an overview that "the temerity of such an enterprise borders on the ludicrous." Archaeologists speak of a series of populations and prehistoric traditions in the Arctic region of North America. The so-called Palaeo-Eskimos (Old Eskimos) seem to have reached the coast of Alaska from Siberia almost 5,000 years ago, according to radiocarbon dating. They probably represent the ancestors of the people referred to as "Tuniit" in Inuit oral tradition, the people encountered by the Inuit as they arrived in Arctic Canada. Some of their descendants, between 500 BC and AD 1500, developed the Dorset culture, named after the community of Cape Dorset, where their settlements were discovered. The other major population movement into the North American Arctic, that of the

“Neo-Eskimos,” occurred around 1,000 years ago and reached the eastern Arctic by about 1150. The Neo-Eskimos adapted to aquatic resources with a social organization more complex than that of the Palaeo-Eskimos. Their early descendants in the eastern Arctic are often identified as Thule Inuit. Meanwhile, in the ninth century, after the settlement of Iceland, the Norse established colonies in southwest Greenland. With the eastward movement of the Inuit and the westward movement of the Norse, the two groups eventually met, probably in the eleventh and twelfth centuries. Encounters were described in both Icelandic sagas and Inuit narratives. After more than four centuries, the Norse colonies collapsed, apparently partly due to climatic reasons.

The modern Inuit of northern Alaska, Arctic Canada, and Greenland are frequently assumed to be the direct descendants of the Neo-Eskimos. An alternative hypothesis, however, suggests that the modern Inuit have descended in part from Palaeo-Eskimos. This hypothesis gained political momentum during the ethnic revival of the twentieth century, partly because ancient occupancy seemed to strengthen the Inuit case in negotiations of land claims. McGhee (2006: 113) suggests that

archaeologists found themselves in a situation where academic interpretations were given political significance, and again it has become increasingly clear that the version of history advanced by those with a political interest was likely incorrect. Rather than being ancestral Inuit, it seems probable that the Palaeo-Eskimos can be identified with the people known to Inuit tradition as “Tuniit.”

There are grounds for taking ethnopolitical rhetoric with a grain of salt, but McGhee’s assertion that Inuit claims of Palaeo-Eskimo ancestry are “incorrect” may be an overstatement.

## 4.2 The Silk Road of the Arctic

While the Human Genome Diversity Project gave rise to intense anthropological debates about method, politics, and ethics, work continued. None of the fifty-two groups represented by the Centre d’Etude du Polymorphisme Humain (CEPH) panel, with the possible exception of the Siberian Yakut, are located in the Arctic. Genetic studies estimating the age of maternal (mitochondrial DNA [mtDNA]) and paternal (Y chromosome) lineages suggest an initial entry time of ancestral Native Americans of between 20,000 and 15,000 years BP (Schurr 2004: 571). The last significant phase of expansion into the New World included the Eskimo-Aleuts and the Na Dene. The archaeologically inferred mutation rate of the mtDNA control region often used to calibrate divergence into units of time in studies of human mtDNA sequence variation – the somewhat speculative rate of one transition per 20,180 years – was originally established in archaeological research in the

Arctic and was based on the premise that variation observed among a few Eskimo and Na Dene sequences had accumulated over a period of 11,300 years (Forster *et al.* 1996).

The outlines of human migrations into the North American Arctic are rather well established, but their details are still matters of debate. In particular, the relationship between the late traditions of the Dorset people and those of the earliest Neo-Eskimo Thule Inuit has remained unclear. There is still some truth to Maxwell's (1980: 170) statement that "termination of Dorset culture and its relationship to Thule encroachment from the west remains a paramount problem." It seems increasingly likely, however, that the Dorset and the Thule Inuit coexisted for a period and were aware of each other. Mary-Rousselière (1984: 443) suggests that remnant Dorset survivors (Sallirmiut) on Southampton Island and at Foxe Basin were known to the Inuit; the Sallirmiut "were considered to be barbarians, and no one maintained relations with them." Recently documented oral histories from Canadian Inuit describe early encounters between Inuit and Tuniit. These accounts tend to dwell more on the material remains of the Tuniit and their conflicts with Inuit than on what they might physically represent.

The archaeological debate on Dorset and Inuit settlements during the period from 800 to 1150 seems to be tilting toward the account from Inuit oral history – that is, the idea of temporary coexistence. Basing his research in an area known as Iqaluktuuq, near Cambridge Bay on Victoria Island, Friesen (2004) presented new excavations and radiocarbon dates. To him, the Iqaluktuuq area is a regional archaeological hot spot, with a fairly complete archaeological sequence for much of the central Arctic. One reason is that the Ekalluk River, along which the key sites are located, served to concentrate the vital warm-season resources of arctic char and caribou. Friesen's results indicate that the Late Dorset lived in relatively close proximity to Thule Inuit for at least a century (2004: 689). Multiple dates from his three Late Dorset sites suggest relatively recent occupation, during the twelfth century (firmly within the period of early Thule Inuit occupation), indicating some kind of contact. Victoria Island was the center of an early archaeological debate involving the possible intermixing of Norse with Inuit and Dorset. Recent archaeological findings indicate that occasional contact occurred between Norse and Dorset in the Canadian eastern Arctic, possibly over several centuries.

While the archaeological and linguistic records resolve some riddles, they cannot tell us whether Dorset-Inuit, Inuit-Norse, or Inuit-Dorset contemporaneity involved exchange of goods, population replacement, or interbreeding. One avenue for resolving the issue is DNA analyses of ancient bones; another is genomic anthropology among living Inuit. Agnar Helgason and I took the latter route, launching the Inuit Genetic History Project, a research project on the genetic history and migrations of Inuit populations in the North American Arctic. We decided to base our project in Greenland and the Kitikmeot region

of Nunavut. The Kitikmeot region seemed a good choice because of both recent reflections on Dorset-Inuit interactions and early debates about the possibility of contact between the Copper Inuit on Victoria Island and the Norse. The Kitikmeot area is quite possibly a genomic as well as an archaeological hot spot, the Silk Road of the Arctic. The project collected buccal swab samples from 299 people of presumed Inuit ancestry in the Kitikmeot region and fourteen locations throughout Greenland. The first publication based on the project (Helgason *et al.* 2006) examines mtDNA control-region sequences from these locations and compares them with previously reported sequences from Greenland Inuit, Chukchi, Siberian Yupiit, and Alaskan Aleut.

Basic results of this work include the following: (1) Greenland and Kitikmeot Inuit are relatively homogeneous genetically when compared with Yupiit, Chukchi, and Aleut populations; (2) significant differences appear among the subgroups of Greenland and between the groups of Kitikmeot, Siberia, and Greenland; and (3) there is no indication in the Kitikmeot data of Inuit-Norse admixture. Given the concern with the Dorset-Inuit riddle, these results are significant in that they seem to suggest “a complicated pattern of regional stratification in the distribution of individual haplotypes that is not easily accounted for by the prevailing hypothesis that all Inuit populations in Canada and Greenland are exclusively descended from Thule ancestors that expanded from Alaska only 800–1000 years ago” (Helgason *et al.* 2006: 132). The alternative scenario suggesting that expanding Inuit groups encountered Dorset populations in Canada and Greenland and interbred with them would, however, account for contemporary patterns of mtDNA variation in Canada and Greenland. This may indicate “a matrilineal contribution to contemporary Inuit populations of the Dorset peoples who inhabited Greenland and the Canadian Arctic prior to the Thule expansion” (Helgason *et al.* 2006: 132). Given this result and Friesen’s recent dating from archaeological sites in the Kitikmeot region, it is likely that the Late Dorset and Thule people not only coexisted for a time but actually interbred. While these are preliminary results and more work is needed, the Inuit Genetic History Project illustrates the usefulness of genomic anthropology in exploring – along with archaeology, linguistics, and folk narratives – the trajectories of the past.

In many contexts ancestry is a highly sensitive matter, with potentially grave consequences for cultural identity, citizenship, and access to important resources. Anthropological research in this domain, therefore, must be particularly sensitive to local context and community concerns.

### 4.3 The IGHP: a brief ethnography

Mindful of the unpleasant history of research on human remains and genetic characteristics among indigenous groups and the marginalization of Inuit during the colonization of the Arctic, Inuit authorities have been anxious to

monitor research in their jurisdiction. Kral and Idlout (2006) have outlined the changing Canadian context in the wake of the creation of the Nunavut Territory in 1999. Before the IGHP could begin, complex protocol procedures had to be followed. Formal applications were sent to Nunavut and Greenland in 2002. The goals of the project, as well as procedures of sampling and consent, were outlined in English, local Inuit languages, and Danish. The “experimental protocol” explained that the researchers’ aim was twofold: “to examine the population history of, and genetic relationships between, Inuit groups” and “to establish whether there was any genetic evidence for early Norse admixture in Inuit groups from Greenland and Victoria Island in Canada . . . The data gathered for this study will . . . be used to explore the genetic history of Inuit populations in Greenland, Canada, and the Arctic, more generally – a task that has barely begun.” The research protocol also had to be screened by the National Bioethics Committee of Iceland.

In order to seek permission to collect samples in Nunavut and to explain the project in person to scientific staff and community leaders, I visited both the Nunavut Research Institute in Iqaluit and the community of Cambridge Bay. In Cambridge Bay, meetings were organized with the elders of the community (the informal leaders) and the hamlet council. Some people suggested that the Inuit were “overstudied”; “Southern” researchers appeared every year, they said, only to explore an issue others had already studied in detail, and most of them left once they got the data they were after, never to return to the community. Among the critical questions from the elders and the council members were where the samples would be analyzed, what would happen to them once they had been processed, how personal privacy would be secured, how findings would be communicated to the local communities, and what financial motives the researchers might have.

To advance my understanding of local context, I interviewed a few Inuit elders with the aid of a local interpreter and requested collaboration with the Kitikmeot Heritage Society (KHS). The elders expressed interest in exploring relations among Inuit and between Inuit and other people, Tuniit and Qallunaat (whites). The KHS agreed to collaborate and to arrange for sampling. Once Helgason and I were granted the necessary permissions and the local contacts had been established, our collaborators in Cambridge Bay and Greenland collected mouth swabs, which were then shipped to Iceland. In Greenland, the procedures were different. Originally, the Greenlandic Home Rule Government wanted to take responsibility for research negotiations and licensing, but, faced with a growing bureaucratic burden, it relegated licensing to the Danish Polar Research Centre in Copenhagen, which had previously dealt with such tasks.

As I was not present during sampling, I cannot provide detailed information on its context. My impression, however, is that in Cambridge Bay people were

generally enthusiastic about collaborating with the KHS. The KHS would approach the individuals in question, focusing on elderly people whose parents and grandparents had grown up in the region of the Copper Inuit. In Greenland, a physician based in the capital town of Nuuk who was involved in medical research throughout Greenland carried out sampling. The key issue was “health” rather than “heritage,” but here, too, the study seems to have been generally welcomed.

A year after the sampling, Helgason and I visited Cambridge Bay and Nuuk to communicate our tentative findings and to discuss their implications with students, teachers, community leaders, and the local media. In both places, eager discussion of the results reflected the great local interest in exploring the history of the communities and of the Inuit in general. Some of our conclusions, especially those indicating pan-Inuit genetic connections throughout the Arctic and the virtual absence of early European traces in the genome of the inhabitants of the Kitikmeot region, were met with enthusiasm. When the elders of Cambridge Bay were presented with these findings, some of them cheerfully raised their fists into the air with a loud “Yes!” as if their favorite athletic team had won an important victory.

During the return visit to Cambridge Bay, we were told that one of the local concerns informally expressed when I was negotiating for research permission was potential “whiteness.” Had there been a substantial “white” component in the genome, some people hinted, the community might lose its entitlements under Nunavut rules. Important indigenous rights, including health benefits and social services, might be jeopardized by genetic analyses. However, while some indigenous groups may restrict membership and entitlements (for example, revenues from casinos) with reference to genetic results, the chance of being denied Inuit status in Nunavut is negligible because, according to the Land Claims Agreement, beneficiary rights are based on self-identification: To be Inuit, it is essentially sufficient that a person be known to have an Inuk kinsperson. Moreover, to most people in Cambridge Bay, the probability of discovering hidden traces of “whiteness” in their genome seemed remote, if not an absurdity. What if our results had violated their sensibilities? The issue of “whiteness” indicates the importance of “thick” description and forms of collaboration.

The procedures followed by the IGHP are routine for research in Nunavut, Yukon, the Northwest Territories, and indeed much of the Inuit region. In hindsight, however, collaboration with the communities in question right from the beginning and more intensive fieldwork would have been desirable. While I had done research in the Northwest Territories, I had no prior experience of either Nunavut or Greenland. In her review of genetic studies of indigenous populations in northeastern Siberia, Rockhill (1999: 77) calls for an increased awareness of the implications of ethnic identity for procedures of sampling and

for a new method of research “using the ‘participant observation’ method, [to] study the social background, life and family histories, and concept of ethnic identity, thus collecting information that emerges slowly and is not disclosed readily to a stranger.” One responsible and informative way to proceed is to engage in participatory projects with “nonprofessionals.” Both ethnographers and archaeologists have increasingly adopted such an approach in Arctic research.

#### 4.4 Research practices: the Arctic and beyond

Collaborative approaches are not new to anthropology; for decades there has been much talk and experimentation on rapport, dialogue, and consultancy, partly drawing on feminist scholarship and critical ethnography. Heath (1997: 68), for instance, suggested the notion of “modest interventions” to refer to “translocal engagements that reveal, perturb, and perhaps transform the constructed boundaries between local, situated knowledges.” However, “collaboration” is being formulated with more force and precision now than it was before. Lassiter (2005) argues that ethnographers are increasingly applying the term to the entire process from research design to the dissemination of results. For him, this has to do with the shifting context of fieldwork and the growth of multi-sited ethnography: “In sum, the “new ethnography” potentially moves collaboration from the taken-for-granted background of ethnography to its foreground” (Lassiter 2005: 72).

Taking the collaborative model seriously may necessitate innovative thinking and radical restructuring of academic institutions and research practices. Clifford (2004) has explored collaborations between academics and Alaskan Natives on heritage projects, pointing out that some lean toward a multivocal model juxtaposing Native and non-Native views while others are more community-based, primarily reflecting Native perspectives. In his discussion of the work of anthropologist Ann Fienup-Riordan, who collaborates closely with the Yup’ik people, Clifford (2004: 12) comments, “It is arguable that her choice to remain unaffiliated with any university or governmental institution has given her the flexibility to pioneer collaborative styles of work, engaging in relations and projects which might have seemed ‘unprofessional’ before they became, under pressure, the norm.” Several ethnographers with firm institutional affiliations have, however, developed equally innovative collaborative styles in Arctic research.

In principle, similar arguments should apply to comparative studies of the human genome and genomic anthropology. Despite all the debates on the HGDP and the lessons they should have provided, a meaningful discussion of the key issues involved – in particular, forms of collaboration – seems strangely absent in recent reflections on the state of the discipline.

While Stone, Lurquin, and Cavalli-Sforza (2007: 233) usefully outline the issues that some critical voices have referred to as “identity politics,” they conclude that a radical distinction between “scientists” and “people themselves” must be maintained: “How individuals or groups choose to use or not use genetic knowledge to construct their own kinship, ethnic or any other social or cultural identity is independent of genetic science.” In light of the history of the “race” concept and its messy co-construction by scientists and the public despite the appearance of scientific “purity,” such a distinction does not make much sense. As Palmié (2007: 207) has argued with reference to the use of DNA testing in “discovering” genomic pasts (in “racecraft,” the making of racial histories), “Genomics, like divination, gives material shape to, and thereby reproduces as social reality . . . ideologies of invisible essences and agencies.”

Collaboration is not a smooth or easy road. Difficulties may stem from disagreements about fundamental premises. Some Native Americans, for instance, suggest that established archaeological narratives about the crossing of the Bering Strait are seriously flawed. Adherence to those narratives may cause havoc in collaborations on genetic history and human migrations. Another potential problem relates to the linking of rights and “race.” In New Zealand, recent government settlements for grievances relating to the history of colonization have made the establishment of ancestry a central concern for the indigenous Maori. Keeping in mind increasingly strained relations between museums and indigenous groups over ancestral property, anthropologists may avoid taking any part in the forensic work involved. At the same time, given the notions of the Maori about genealogical continuity and spiritual links to the ancestors and their interests in determining whether physical remains are indigenous, some anthropologists have been led to believe that they are obliged to offer their services. Cox, Tayles, and Buckley (2006: 869) suggest that the “identification of the race and therefore the ancestry of human physical remains by forensic anthropologists could be seen as ethical responsibility.” This, they argue, is not as straightforward as it may sound; the “racial” identification of individuals necessitates a set of classificatory standards that can be established only through a prolonged study of Maori remains, which is distressing to many Maori.

A further problem may be the technical nature and novelty of genomic research. It may be more difficult to elicit statements from Inuit elders about haplotype clusters and gene frequencies than, for instance, about house remains, linguistic utterances, human migrations, or soul-names. Not only approach and epistemology but also interests and motives may differ between the Inuit and non-Inuit scientists. As a result, research may mean very different things to these two groups.

Some collaborative genome projects may be abandoned at the design stage as a result of a lack of mutual understanding of goals and procedures.

Researchers may be locked in biopolitical battles that originated elsewhere, making collaborative research practically impossible. Other projects may have trouble with communication breakdowns in midcourse or at the writing stage. With the growth of indigenous movements, increasing demands for the return of ancestral bones and the repatriation of artefacts, resistance to domination and exploitation, and the quest for freedom to construct heritage and cultural identity, studies of ancestry (genomic and otherwise) are likely to be more responsive and collaborative than those in the past, exploring forms of organizing and governance suitable for different themes and contexts. One useful source of models is recent theorizing on scientific and technological development emphasizing “mode-2” forms of knowledge production (Nowotny, Scott, and Gibbon 2001) that involve heterogeneous teams geared to specific contexts and issues, in contrast to the “mode-1” forms of investigator-initiated and discipline-based approaches.

Among the questions that must be addressed in collaborative research are the following: How is a community defined, and how can researchers deal with differences in perspectives and interests? To what extent should the agents of collaboration be the pan-Inuit “community” of the Arctic, the democratic bodies of Nunavut and Greenland, individual towns and villages, social groups within them, or single individuals? What kinds of decisions should be made at different levels? How should decisions be made regarding licensing and the distribution of income generated from collaboration? Finally, keeping in mind how sensitive the issue of genetic origins and identities is, how should projects deal with the potential clash, in both research design and interpretation of results, between the perspectives of researchers and the ethnopolitics of the people providing genetic material and information?

Forms of collaboration will depend on context, researchers, and the kind of research in question. For instance, projects may differ in that some try to document human genome diversity while others seek to trace origins and migrations of particular clusters of genetic traits. The global genome, however, is riddled with major divisions and inequalities. Thus, the notion of “health biotechnology” is usually raised in association with research-intensive Euro-American universities, not in connection with poor people in developing countries. Much genomic research has assumed a rigid dividing line between the Global South (and the High North) and the Global North or the “West.” Despite the recent blurring of the directions on the compass represented by these terms, the dividing line has remained rather simple: “We” deserve personal autonomy while the “natives” need to be protected by specific research agreements and instruments. In the Global North, the principle of informed consent has invariably been applied, while genome research among marginal groups in the Global South, for instance, in the work of the HGDP, introduced the concept of “group consent” (see Reardon 2005). Both principles

have their rationales. The former was derived from the Nuremberg Code of 1947 and its focus on voluntary consent in biological research on human subjects, while the latter was an attempt to respond to accusations leveled at human genetic research in the Global South of failure to respect the will and dignity of the subjects. It is difficult to see why there should be such an enormous difference between Global North and South. Group consent, besides being problematic in that it naturalizes “ethnic” units and boundaries, also seems to paternalistically undermine individual rights that are taken for granted in genomic and medical research in most Euro-American contexts. Individual consent, however, has also come under fire in recent bioethics debates, indicating a communitarian turn. Knoppers and Chadwick (2005) suggest that a new “participatory approach” has emerged as a result of the growing influence of social science on ethics and the reinterpretation of the concept of “expertise” in genetic ethics.

It is important to rethink Orientalist structures of research, with their dualisms and hierarchies. It may be essential to relax or destabilize some of the ethnocentric assumptions of the grand narratives of Western biology and bioethics. Deliberately juxtaposing particular aspects of her ethnography from a Papua New Guinean context and headline news in Europe and North America about biomedical innovations and public responses to them, Bamford (2007: 176) concludes that the issues that have “recently confronted European and North American audiences concerning the dislodging of long-standing conceptual frameworks” have “little in common with Kamea perceptions of the world.” For Bamford (2007: 79), Kamea notions of life itself offer a theoretical glimpse into the biosocial realities of the contemporary world: “In a world where embryos can be ‘put on ice’ and the dead can be forced to procreate, Kamea furnish us with a new perspective upon which to reflect upon what is essential about persons, reproduction, and crossgenerational relationships.” Inuit contexts, as we will see in the following chapter, are equally informative.

The key problems encountered by the HGDP are unlikely to wither away or drop out of public consciousness unless comparative anthropological research on the human genome undergoes a paradigm shift. The ruptures and inequalities of the past should not blind us to the possibility of dialogue and collaboration in research, be it in history, archaeology, linguistics, or genomic anthropology. An important avenue for avoiding tension over representation or potential exploitation and abuse is to adopt a collaborative research model, in which subjects become consultants or even co-researchers.

#### 4.5 Conclusions

Although the relations between the local and the global in genomic research are often fraught with tension, competition, and mistrust, there is also plenty of

scope for mutual collaboration. Thus, analytical work carried out by individual laboratories benefits from the mapping of the human genome projects, and likewise, individual laboratories sometimes contribute their own mapping efforts. Such exercises underline the interdependence of individual genome projects, the new networks of associations that have been developing, and the relevance of anthropology. In some ways, the IGHP, co-organized by an anthropologist (Helgason) engaged in a variety of projects on genomics and ancestry at deCODE genetics, is an indirect product of these networks.

In many contexts, genetic discourse has a powerful role to play in informing public consciousness, reshaping existing academic fields and disciplines, and signaling the arrival of new ones. The discourse, however, is complex, and a new paradigm may be imminent. As Lock (2005: S51) suggests, "It is eminently conceivable that a paradigm shift of enormous significance is now under way in basic biology, a shift that could potentially transcend outmoded nature/nurture debates and simplistic discussions of gene-environment interactions." Anthropology cannot resist being affected by and affecting these developments. Not only does the new genetics provide an exciting site for the ethnographic exploration of a whole range of issues, many of which are identified with reference to the Greek term for "life" (biopower, biosociality, biopolitics, biomedicine, biovalue, and so on), but it also opens new and important avenues for studying human variation, history, and evolution.

I have suggested that anthropology must seriously engage with genomic research, resisting both the naturalization of the social and the socialization of the natural. In their attempt to "unwrap" the "sacred bundle" of the four-fields approach in anthropology, Segal and Yanagisako (2005: 11) ask the following rhetorical question of colleagues who argue for holism: "When was the last time that research on hominid evolution or primates was helpful to you in thinking about your ethnographic data?" The point is not to reinforce a rigid monologue along the lines of the traditional four-fields approach but to foster an open-ended, hybrid network of subdisciplines, programs, and research practices suitable for an academe that is increasingly postdisciplinary. Such an approach seems to resonate with a "world anthropology" (Restrepo and Escobar 2005) that attempts to break out of the mould of European and North American contexts.

Introduced by Hans Winkler in 1920, the word "genome" is a portmanteau of "gene" and "chromosome." While the genome concept itself draws attention to neither epigenetic processes beyond the cell or organism nor critical engagements with the larger context of genetic research, it does seem to carry an implicit reference to some kind of structure. Moreover, it resists the reductionism implicit in the alternative labels of "biological" and "genetic," allowing for causality in development either within or outside the genome or at the juncture of the inside and the outside. In sum, genomic anthropology

involves the study of human genomic variation and history; it attends to basic concepts and metaphors, indigenous and otherwise, including population, lineage, race, kinship, and soul-name, and engages with the implications of genomics for biopolitics and the construction of relations and identities. Genomic anthropology is not a prefabricated thing finally revealing itself to the larger world but rather an important avenue for resolving some of the tensions associated with the study of humans, partly through serious engagement and collaboration with the subjects being studied.

It is too early to say on what terms anthropology will relate to the new genetics. I suggest, however, that anthropologists are co-constituting fresh networks among scholars, laboratories, private agencies, and national and multinational agencies (see Heath 1997). One network is the multinational GenBank, an online genetic sequence database comprising all publicly available DNA sequences. Another important development has been the International Human Genome Project. Despite important ethnopolitical stumbling blocks, the project has generated new bodies of anthropological data. Moreover, it has increasingly brought anthropologists into the realm of biomedical research, where their understanding of human differences and history is useful in population-based studies, the interpretation of comparative data, and the construction and use of large-scale genetic databases.

Perhaps academic fields and (sub)disciplines are best seen as imagined communities. Their practitioners do not necessarily meet face-to-face as a collectivity, nor do their trades consist of predetermined essences destined to unfold through the processes of history. Their communities are constructed and maintained through the boundary work of forums and agencies: conferences, journals, websites, departments, and laboratories. The term “genomic anthropology” will gain currency only to the extent that the anthropologists involved in genomic research find it useful and imagine themselves as belonging to the new networks of associations within which their work takes place.