INTRODUCTION

C. P. SNOW, WHO WAS BOTH a scientist and a novelist, observed in a classic essay from the 1950s that the sciences and the humanities were coming apart at their academic seams and forming "two cultures." He meant this in a specifically anthropological sense—two communities that speak different languages, see the world in different ways, don't understand each other, and regard each other with suspicion. Each thinks itself superior to the other.

This rift is probably irreparable. As the frontiers of knowledge have expanded, it has become hard enough to keep up with the work in one's own ridiculously narrow field of expertise, never mind to read novels, philosophy, or particle physics besides. Scientists lament the lack of science education on the part of the public, but they have ceded to science journalists the responsibility of educating the public. Humanists lecture about the construction of knowledge, but scientists lecture that they are simply recording what is "out there."

This book is about a hybrid field that we can call "molecular anthropology." To a large extent, it epitomizes the insecurities of modern science. On the one hand, technology permits us to study aspects of the human condition in far greater detail than was previously thought possible—that's the meaning here of "molecular." On the

other hand, the scientists themselves have often employed that information to prop up dubious political assertions; or else they have interpreted the information through cultural lenses of various tints, and often with striking naïveté—that's the "anthropology."

Technical sophistication and intellectual naïveté have been the twin hallmarks of human genetics since its origins as a science in the early part of the twentieth century. The way genetics was practiced and preached in the 1920s exploited the cachet of modern science to justify blatant racism and xenophobia.

Times have changed, and technologies have certainly changed. But many of our cultural ideas have remained strikingly unaltered across the generations. We have a strong faith in the power of heredity to shape destiny, in the ability of modern science to arrive at truths about nature, in our identity as a deeply inscribed property, in the constitution of scientific facts to be neither good nor bad (but just authoritative), and in the ability of those scientific facts to speak for themselves.

Each of those propositions is true only to a very limited extent. What is needed in human genetics is a mediation of its fundamentally scientific and humanistic elements.

Anthropology has always been a field of mediation. Classically (in the 1920s), it involved juxtaposing the exotic and the mundane—showing that your way of seeing and interpreting the world is only one of many possible and valid ways, but at the same time showing that what New Guinea tribesmen do is only superficially different from what you do.

In more recent decades, anthropology has assumed the political role of mediator for aboriginal populations (usually the objects of anthropological study, of course) and colonial powers (usually the ones sending the anthropologist out). On the biological end, anthropology emphasizes, on the one hand, the continuity of humans with other primates, but, on the other, the uniqueness of humans among the primates. And in a more general sense, anthropology mediates between professional scholarly knowledge about the world ("science") and popular or cultural wisdom about it ("folk knowledge").

Molecular anthropology necessarily adopts the crucial role of mediator as well. Genetics advertises a classically modern scientific analysis of the human condition, and thus molecular anthropology examines both human populations with respect to one another and our species with respect to other species. At the same time, however, we are forced to ask what meaning to attach to such studies and what value they have. Where human lives, welfare, and rights are concerned, genetics has historically provided excuses for those who wish to make other people's lives miserable, to justify their subjugation, or to curry favor with the wealthy and powerful by scapegoating the poor and voiceless. It is therefore now obliged to endure considerably higher levels of scrutiny than other, more benign and less corruptible, kinds of scientific pronouncements might.

Rather than simply avowing to study our hereditary constitution objectively, dispassionately, and benignly—and being proved wrong time and again—this book is about the way a genetic science of humanity can confront issues. Some of these issues are political, such as animal rights and colonialism; others lie in the domain of folk wisdom, such as ethnocentrism and racism; and still others lie in simply the way science represents itself to the public.

"Molecular anthropology" is a term paradoxically coined by a biochemist in 1962 to designate the study of human evolution by recourse to the differences in the structure of biomolecules. The paradox is that although it sounds like a kind of anthropology, a *molecular* kind of anthropology, it was really the technology of biochemistry merely being applied to classically anthropological questions. And since technology drove this new field, anybody could do "molecular anthropology," regardless of how much anthropology they really knew.

While that may sound harmless enough, consider the opposite case. What would constitute an "anthropological biochemistry" if you didn't need to know any biochemistry to do it?

What I will show in this book is that when the cutting-edge technology of molecular genetics has been wed to a "folk knowledge" of anthropology, the results have invariably been of exceedingly limited

value. This was true in the 1920s, when geneticists sought to rewrite our understanding of social issues by blaming poverty on the genes of the poor. The stock market crash and Depression had a sobering effect on the geneticists.

It was also true in the 1960s, when genetics became molecular and its practitioners began to make observations of seeming profundity, such as "from the standpoint of hemoglobin, man is just an abnormal gorilla." It seems not to have occurred to the sanguine speaker that the standpoint of hemoglobin might just be a poor one for the problem at hand: from the top of the Empire State Building, Chicago and Los Angeles appear to be in the same place over the horizon. But not from the Golden Gate Bridge.

That's a classic anthropological question—whose standpoint is superior? An anthropological approach would be to inquire what it is that each standpoint allows you to see that the others conceal.

The standpoint of science is widely held to be superior to all rivals. Especially by scientists. But once again, it is useful to acknowledge that there may be more than one scientific standpoint, and that the meaning of any particular scientific pronouncement may not be self-evident. And thus in the 1990s, we routinely heard that we are just 1 or 2% different from chimpanzees genetically, and therefore . . . what?

Should we accord the chimpanzees human rights, as some activists have suggested?

Should we acknowledge and accept as natural the promiscuity and genocidal violence that lurks just underneath the veneer of humanity and occasionally surfaces, as some biologists have implied?

Or should we perhaps all simply go naked and sleep in trees as the chimpanzees do?

None of these suggestions, of course, necessarily follows from the genetic similarity of humans to apes, although the first two have been proposed within the academic community and promoted in the popular media over the past few years. (Mercifully, the third has not.) But all of them *sound* as though they might well proceed from that genetic similarity.

An anthropological or cultural perspective allows us to examine critically some of the assumptions that we often take for granted about genetics itself.

The first topic this book addresses is: What does the genetic similarity of humans to apes mean? What is it based on? Does it have profound implications for understanding our nature?

Here we will see that the universe of genetic similarities is quite different from our preconceptions of what similarities mean. For example, the very structure of DNA compels it to be no more than 75% different, no matter how diverse the species being compared are. Yet the fact that our DNA is more than 25% similar to a dandelion's does not imply that we are over one-quarter dandelion—even if the latter were a sensible statement. This will be a primary illustration of the confrontation between scientific data and folk knowledge, and of the exploitation of the latter by the former. The extent to which our DNA resembles an ape's predicts nothing about our general similarity to apes, much less about any moral or political consequences arising from it.

From there, I go on to examine the genetic differences within the human species and how they have intersected with our attempts to classify people into races. Geneticists have attempted to track the evolutionary history of our species with varying degrees of success, often finding what they expect—identifying races in one generation, denying their existence in another. The perspective of molecular anthropology—a social science of heredity—will shed light on both the science itself and the uses of the science.

Perhaps the most contentious issue in modern biology, rekindled by the furor over Richard Herrnstein and Charles Murray's 1994 book *The Bell Curve,* is behavioral genetics. Here the pattern of human behavioral diversity can be compared to the known patterns of genetic variation, enabling us to look critically at the political claims ostensibly derived from the science.

Two modern social projects hoping to justify their existence by recourse to genetics are the Great Ape Project, which argues for human rights for apes on the grounds of our genetic kinship with them,

and the Human Genome Diversity Project, which has advocated the establishment of a genetic museum of the isolated and endangered peoples of the world. Both of these proposals can be illuminated by bringing together the scientific and humanistic elements that bear upon them.

Finally, I explore more generally the ways in which technical and cultural knowledge intersect in the classic conflict between science and religion. This broadens our scope from a humanistic study of heredity to a culturally informed and socially relevant study of the role of science.

Ultimately, that is what molecular anthropology is all about: the intersection of chemical bodies, human bodies, and bodies of knowledge; and their mutual illumination. Molecular anthropology acts as mediator between reductive genetics and holistic anthropology; between formal knowledge and ideology; between facts of nature and facts produced by authorities; between what science can do and what scientists ought to do; and most fundamentally, between human and animal. All of these terms are, of course, laden with meanings, and none of them can be taken at face value.

That's the fun of it.