BOOK REVIEWS

The Evolution of Racism: Human Differences and the Use and Abuse of Science
By Pat Shipman (1994). New York, NY: Simon and Schuster. 318 p. $23.00. ISBN 0-671-75460-2

Human Biodiversity: Genes, Race, and History
By Jonathan Marks (1995). New York, NY: Aldine Hawthorne. xiii+321 p. $23.95. ISBN 0-202-02033-9.

The Bell Curve: Intelligence and Class Structure in American Life
By Richard J. Herrnstein and Charles Murray (1994). New York, NY: The Free Press. xxvi+845 p. $30.00. ISBN 0-02-914763-9.

Race, Evolution, and Behavior: A Life History Perspective
By J. Philippe Rushton (1995). New Brunswick, NJ: Transaction Publishers. xviii+334 p. $34.95. ISBN 1-56000-146-1.

Anthropology is the study of human diversity, its history, and its origins. For most of the past two centuries, the study of human diversity has often involved cataloging of this variation into a small number of largely geographic groups called races. While modern biological anthropologists see more value in the study of the genetics of human diversity and the evolutionary history of our species, the nature and significance of human races is a controversial issue of tremendous political importance. It is also a topic which biological anthropologists are particularly qualified to address. In response to the recent publication of a series of books on race that have received wide publicity and very mixed reception from the public and the scientific community, we solicited essay reviews for the four books listed on the left, from two biological anthropologists, Dr. Henry Harpending and Dr. George Armelagos.

—The Editor

Human Biological Diversity

These four books are about biological diversity in our species. Shipman's *Evolution of Racism* is an excellent history of how human evolution has been treated by scientists and others with political agenda. Murray and Herrnstein's *The Bell Curve* describes correlations between IQ test scores and other attributes of individuals. The strong associations between IQ and economic success, family stability, and other aspects of people's lives put to shame popular social science treatments of these issues. Rushton's *Race, Evolution, and Behavior,* which is about race differences in IQ and cranial capacity, is an attempt to understand these differences in terms of a theory of life-history evolution. The result is not very satisfying to me, but Rushton's provocative attempt to bring the methods of science to the data deserves serious attention and respect. Finally, Marks' *Human Biodiversity* is an articulate, witty hodge-podge of information and opinion about human differences and the history of scientific concern with them. I enjoyed reading the book, but I have little sense of what it was about or why the author wrote it. Whatever else fills its pages, there is little or nothing in it about human biodiversity.

The Evolution of Racism is the best written book of the lot. It is as absorbing as a novel, full of strange and wonderful characters. One of the least interesting is Charles Darwin himself, the main subject of the first part of the book. His important insight, that species are fluid, caused a ruckus among European intellectuals when it was published. The conventional view of the story is that this was a revolution in science and our understanding of the world. A more cynical view is that European intellectuals, mesmerized by Aristotle, would have been surprised to learn that milk comes from a cow. Farmers must have known all about it for millenia. Thomas Huxley was the most interesting character in the play, someone with whom one would really like to have a chat. Darwin, on the other hand, must have been every bit as dull in person as his prose suggests that he was.

The struggle between Virchow and Haeckel in Germany over evolution, education, and race is less familiar to many of us. Virchow emerges as a sort of Boas of physical anthropology who resorted to massive data collection to show that Germans were not all, or even predominantly, blonde and blue-eyed Aryans. Haeckel was the opposite, a theoretician who created a whole doctrine of racial purity that he understood to proceed from evolutionary principles. In retrospect, it is clear that they both would have better reputations today if they had stuck to science. Indeed, the central lesson from Shipman's book is that anyone who deduces political or moral consequences from science is sure to look like a fool several decades later. This sad parade continues to the present; Spencer, Haeckel, Virchow, Muller, Dobzhansky, Washburn, Montagu.

The Evolution of Racism is a pleasure to read and gives a nice perspective on the controversies, inspired by political conviction, that plague studies of the history and diversity of our species today. I am not so convinced (nor, I gather, is Shipman) that ideas and trends in the human sciences have such a great impact on public policy and practice. There were pogroms in central Europe long before Haeckel's Monist movement. It makes no more sense to blame the eugenicists for the holocaust than it does to blame Margaret Mead for the AIDS epidemic.

The Bell Curve and *Race, Evolution, and Behavior* are mostly about IQ tests, what they predict about people, and how IQ is distributed within and between groups. *The Bell Curve* is a classical social science description of the correlation between IQ test scores and many measurable aspects of the lives of people in America, while

Rushton's monograph tries to comprehend data about race differences in IQ scores and in other aspects of morphology and behavior within a framework of different selective regimes in the histories of human races. *The Bell Curve* is a straightforward narrative that describes how an individual's IQ predicts job performance, school performance, likely mode of reproduction, likelihood of being convicted of a crime, and, perhaps even health and longevity. This is as good as social science gets and, perhaps, as good as social science ever will get. It is a treasure chest of applicable knowledge of great potential value for business, commerce, education, and politics. On the other hand, it is not science and it does not point to any new directions or new understandings about the world. It is just high-quality inductive tabulation. Two polar ways of understanding the world are induction and deduction. Induction, generalizing from data to principles, is the foundation of scholarship and most social science. Deduction, the formulation of models and the attempt to falsify them by comparing the prediction of models to what is observed, is the foundation of natural science. Natural science is an esthetically barren way of understanding, but it has led us to bridges that stand up and airplanes that stay in the air. Induction and scholarship, on the other hand, hardly ever lead to new understandings about the world. We can defend the claim that twentieth-century natural science is better than nineteenth-century natural science but there is little basis to claim that twentieth-century art criticism, history, and social science are better than their nineteenth-century counterparts.

Tabulation of data is an important task, and modern computing machinery makes it easy. There are important empirical questions that can be answered only by tabulations. Is surgical procedure *A* better than surgical procedure *B*? Does garlic cure infections? Is an aspirin tablet better or worse than a vitamin C tablet for treating headache? But tabulations by themselves have hardly ever led to scientific understanding of anything.

Imagine, for example, that we were to approach chemistry by social science techniques. We would spend a lot of money measuring anything measurable about substances and materials around us. With modern computers, we would create a huge database; with modern software, we would make any patterns readily apparent. We would discover, for example, a correlation between "conducts electricity" and "shininess." In the jargon we would say that "shininess" is a determinant of conducting electricity. Another group would find that "density" is also a determinant of conducting electricity. Papers would appear discussing whether density is a determinant of shininess or shininess of density. None of this would get us close to the periodic table or anywhere near modern chemistry. Meanwhile policy experts would advocate polishing household machinery to make it shinier, and thus more efficient. Universities would be plagued with workshops on shining up things. All these applications of empirical knowledge would follow from the linguistic sleight of mind equating "determinant" with "cause."

The Bell Curve is the very best of this gray social science kind of knowledge. The authors have taken a huge database about the lives of a large sample of Americans, used modern computers to tabulate the relationship between IQ test score and other characteristics of the subjects, and shown that it is possible to predict a lot about most of these characteristics given the IQ test score. In particular they tabulated information from the National Longitudinal Study of Youth (NLSY), a publicly available set of data on a sample of thousands of Americans that is not unlike my hypothetical database on substances. There are no surprises in the findings of strong statistical relationships between IQ score and race, class, educational attainment, criminality, and even health. There has been a lot of public discussion and debate about the political context and implications of these findings. Although a substantial part of the book is about policy, I will confine myself to aspects of the book that are relevant to evolutionary anthropology.

First, it is stunning that the strong relationships between IQ test scores and other characteristics of people are well known to most laymen, on the one hand, and to professionals in the field on the other, but they seem to have been an ugly surprise to many intellectuals and journalists in between. One colleague who uses the NLSY data remarked to me that "we have all known that IQ blows all the other variables away." Several decades ago, Arthur Jensen and Richard Herrnstein both published monographs about IQ tests and their correlates, and both were shouted down in print by those who found the political implications of their findings to be incorrect. Many journalists apparently heard the loudest voices, never looked at the evidence, and were taken completely by surpise when the *The Bell Curve* appeared. Two sources that many of us want to respect, Scientific American and The New York Times, have disgraced themselves over the book.

Second, it is a sad commentary on the practice of social science in this country that the importance of IQ scores in the NLSY and other data sources was not described so thoroughly until 1994. The CD Rom with all the data can be had for about ten dollars, and it has been available for years. Many readers of this review could, with little difficulty, duplicate the analyses in *The Bell Curve* on their own desktop computers. The whole topic has been so loaded, because of the association with race, that most researchers have covered their eyes so they would not see it.

Why has orthodox social science avoided IQ? There seem to be several reasons. First, much of the support for social science research, and it is well supported, comes from the National Institutes of Health, where the political context of social science research has high salience. Second, the relationship between IQ and other variables is not comprehended by any extant theory. The relationship between IQ and income, for example, is too much like the relationship between being shiny and conducting electricity. Finally, there is a stance in a lot of social science that social phenomena have to be explained in terms of other social phenomena and structures, whereas IQ is a property of individuals that is mostly genetically transmitted. Truly wretched environments during development may lower IQ scores, but there is almost no solid

evidence of any environmental effects on IQ test scores in the normal range of variation. Methods for estimating the heritability of IQ yield a term that is called "environment," but this term includes measurement error, nonadditive gene effects, and other noise. Direct searches for environmental causes of IQ differences, like exposure to lead, have not turned up anything convincing.

The result is that IQ tests, arguably the most effective and useful nonmedical technology produced by the human sciences, are almost self-consciously ignored in academia. It is as if there were a large federal agency devoted to research on headache, but no one in this agency ever discussed aspirin because its mechanism of action was unknown and aspirin was politically dangerous.

At any rate, it is important to understand what IQ is and how it is measured. To do this, it is easier to think about an analogous problem, how we might go about measuring someone's size. Size, like intelligence, is something that we all understand but that has no explicit definition. Recognizing that the problem of defining size is just semantics, we might decide that by size we mean weight. Or we might define size as stature. However, there is another way of measuring size that is purely inductive, but that has some desirable statistical properties. We take a large number of measurements of a lot of people, then compute the linear combination of measurements that has the greatest variability in our population. We might end of with a formula like the following:

size = 0.20 * height + 0.45 * weight + 0.27 * leg length + 0.15 * arm circumference +...

This is a desirable definition of size because it is the single number that best differentiates people in our sample. But it is important to understand that this definition has no basis other than convenience. With another sample of people, we might construct a similar measure with slightly different coefficients. Given a population in which stature varied a lot, the coeffiecient of height in the equation might be larger.

Intelligence tests are simply batteries of a lot of questions and tasks, precisely like the collection of physical measurements we took to construct our statistic that measures size. Pick a series of apparently random questions: What is the capital of Paraguay? How many digits of pi do you know? What is the difference between effect and affect? Then find the linear combination of responses that has maximum variance, and you have an IQ test. With this in mind, two themes in the literature about IQ testing clearly are not very important. First, do IQ tests really measure intelligence? Does our formula really measure size? These are entirely semantic matters to which there is no sensible answer. These are just numbers that describe attributes or abilities of people. Second, what is *g*? Within the testing community there is an idea that there is a hidden dimension called *g* that IQ tests are measuring. It is as if there were a very real but difficult-to-observe quantity *S* that different statistics related to size reflect. We might say that weight is closely related to *S*, whereas toe length is less so. In the jargon of the discipline, weight is highly S-loaded, while toe length is not.

The mystical *g* is just as elusive as Plato's essential chair, which was only manifest in the real world as shadows on the wall of the cave. *G* is every bit as misguided as *S*, our Platonic essence of size that is only vaguely reflected in height, weight, and all the rest of the things we measure. Much of the fancy discussion in the IQ literature is about reifying *g*, and it probably is safely ignored.

On the other hand, there are some quite interesting problems and puzzles in all this crass empiricism. Why should IQ be such a fundamental predictor of human performance and behavior? How can one number describe and predict so many abilities and attributes of individuals? Why is it not multidimensional? If we look separately at tests that seem to demand language competence of some sort and at tests that seem to demand algebraic and geometric skills we find that scores are correlated. People who are better at language are also, statistically, better with numbers and figures. Why should this be so? Why are they not negatively related?

It is a basic understanding in evolutionary biology that directional selection should exhaust the additive variance of a trait. Milk production in dairy cows, for example, is not very heritable because of the long history of selection for milk production. In the history of our own species, we know that the brain has expanded rapidly in the last several million years, probably because of natural selection for a bigger brain. Was this also selection for IQ? If so, why is IQ so highly heritable today? The suggestion from the heritability is that IQ has not had much effect on fitness in our phylogeny.

Another puzzle is the apparently high level of variation among groups in average IQ levels. Genetic differences among groups are conventionally described in population genetics by a statistic called F_{st}, the ratio of genic variance between groups to the total genic variance of the trait. For most genetic markers that are neutral or nearly so, the value of this statistic among regional human groups is about ten percent. The equivalent statistic computed from mitochondrial DNA diversity is also ten percent. Even F_{st} estimated from a large suite of measurements of skulls is ten percent. On the other hand, the estimated value of F_{st} for skin color is six times as great, leading to the obvious deduction that skin color has been subject to local selection pressure. IQ differences among groups are probably more variable than the ten percent characteristic of neutral markers, but perhaps less variable than the sixty percent characteristic of skin color. If this means that there is a selective history determining group differences in IQ, what could it have been?

Rushton's *Race, Evolution, and Behavior*, which is a description of group differences in IQ and in other morphological and social traits, also attempts to understand them in terms of the different evolutionary histories of groups. His thesis is that as modern humans moved out of Africa into colder climates there were selection pressures that favored a whole constellation of traits, including higher intelligence.

There is a poorly understood heuristic concept in ecology that relates the life histories of organisms to their environments. The idea is that organisms have first to maintain them-

selves, then to reproduce in order to propagate their genetic material. Organisms that allocate more resources to maintenance are called *K-strategists*; those that allocate relatively more to reproduction are *r-strategists*. The terms *r* and *K* are from the convention in writing the logistic model of population growth in which *r* is the intrinsic rate of increase of a population in the absence of intraspecific competition and *K* is the "carrying capacity" of the environment. Thus, selection might favor higher *r* in a species that colonizes empty habitats or that suffers high levels of random prereproductive mortality, while selection would favor higher *K* in a species that must compete with conspecifics. Weeds are *r*-strategists, whereas tropical trees are *K*-strategists. Weeds succeed by putting resources into a lot of seeds that colonize transient environments. The organisms themselves are of low quality and don't last long. Tropical trees, on the other hand, succeed by making high-quality durable organisms that overgrow conspecifics and synthesize elaborate chemical defenses against potential predators and against each other. I call this a "heuristic" rather than a model because no one has ever been able to formalize it, make it into an expicit theoretical construct, and use it to predict anything that was not already known. It feels right but it is not a theory, despite a lot of effort directed at trying to make it into a real theory.

Rushton organizes a wide-ranging description of race differences according to his version of the *r* to *K* continuum. Asians, according to his formulation, are the most extreme *K*-strategists of our species, with bigger brains, higher IQ test scores, lower mortality, lower criminality, smaller genitalia, lower levels of sexuality, and more introversion. Africans are at the other extreme, with Europeans intermediate on all these dimensions.

There are problems with his formulation. Because the model is so vaguely defined in the ecological literature it is not difficult to be convinced that data fit the model. For example, if *r*-strategists put more resources into reproduction and reproductive tissues, then the prediction is that a relatively *r*-strategist variant of our species should have larger testes. Rushton presents some evidence about this, but he presents even more evidence about race differences in penis size. How does penis size reflect *r*- versus *K*-strategy? I don't think it does.

The mechanism driving race differences in reproductive strategy is also not clear in Rushton's formulation. He suggests that the relative *K*-strategy of Europeans and Asians was favored by harsh cold seasonal environments. In the ecological literature, however, harsh environments favor *r*-strategists. Willows in the arctic are strategic weeds compared to teak trees in a tropical forest. There are some suggestions: IQ may have been favored in cold climates because intelligence is required to forage in these environments; cooperation may have been favored by the need for communal hunting of herd mammals; and these changes were achieved at the cost of resources allocated to sexuality and reproduction. But if, for example, Africans allocate more resources to reproduction, why are birthweights lower rather than higher in Africans? Even simpler mechanisms that might have been at work. Large brains and corresponding high intelligence might be disfavored by high environmental temperatures. Brains generate a lot of heat. Or the difference in the load of parasitic and infectious diseases in tropical and cold climates might be the critical environmental pressure.

I could easily pick at Rushton's hypothesis and, much less easily, at his data for many pages. He has given us a lot of diverse material into which we can sink our teeth. It almost certainly fits together into a coherent pattern. I am not at all convinced that he has seen the right pattern, but I don't have anything better to offer. Most important, there are predictions that can be tested—for example, that Eskimos ought to have high scores on IQ tests. Most alternative formulations do not make any predictions. What, for example, does the theory that racism accounts for group IQ test score differences predict about Eskimo IQ?

I believe that Rushton deserves congratulations for bringing together this very important pioneering work and, most of all, for trying to understand it within the framework of natural science. Perhaps there ultimately will be some serious contribution from the traditional smoke-and-mirrors social science treatment of IQ, but for now Rushton's framework is essentially the only game in town.

Marks' *Human Biodiversity* is witty and articulate. I have read it three times and enjoyed it each time, but at the end of the third reading I had no more coherent view of what it was about than I had after the first reading. Readers of this review should be aware of my inability to grasp the theme or purpose of the book, for I may do it an injustice.

But whatever it is about, the book is not about human diversity. There is almost no substantive treatment of human differences. Instead, there is a mixture of fundamental biology, including a coherent account of what those funny words from cladistics mean, and a history of ideas and speculation about human races and differences.

The pervasive political taint of every chapter makes me leery of the substantive parts of the book. Chapter 5, for example, is about the Eugenics movement in the early part of this century. Marks identifies it as "The only major influence scientists have had on social legislation ...." My immediate reaction is to recall that the "Great Society" of Lyndon Johnson's presidency was firmly based on social and educational science. The same sort of people, dedicated to making a better society by manipulating people, were advocates of eugenics in the 1920s and of Great-Society-type social remedies in the 1960s.

Marks contrasts the intellectual styles of Linnaeus and Buffon—classification and narrative description—and traces competition between these approaches to human differences in European intellectual history. For example, Carleton Coon, with his view of ancient separate races, was an heir of Linnaeus; Frank Livingstone, with his view that most human diversity is clinal, can be considered an heir of Buffon. This is all pretty dull stuff.

Are human differences the legacy of ancient subdivisions of humanity that were genetically isolated from each other? Or are the differences the result of clinal variation with some lumpi-

ness superimposed by major episodes of population growth like the Bantu, Han, or European expansions? This is an empirical issue, not an ideological issue, but the reader would never understand that from this book. On page 163, for example, there is the remarkable assertion that anthropological genetics was developed *"in order to* validate racial categories" (emphasis mine).

Similarly, the idea that biological differences among groups have anything to do with social inequalities among groups is identified throughout as pernicious, dangerous, and wrong. But surely this too is an empirical issue, and any political or moral implications are in the mind of the implicator, not in the answers themselves. Are Europeans greedy? Are Jews natural pugilists? Is love of slaughter the mark of an English gentleman? (These hypotheses come, respectively, from Leonard Jeffries, Jonathan Marks, and Marty Feldman.) These are not very interesting questions, because there is no theory about any of them, to my knowledge, but at least in principle they are amenable to empirical investigation.

I am happy to have Marks or anyone discuss the political implications of one view or the other. I am not so happy with the idea that I have to censor my investigations so that the results align correctly with my politics or those of anyone else. I do not for a moment believe that scientific fashion *causes* political fashion. For example, I can walk into any mall bookshop, ask about IQ, and be handed a book by Stephen Jay Gould, but not a book by Arthur Jensen or Richard Herrnstein. Gould writes what Americans want to hear, while Jensen and Herrnstein's works are not welcome. Even so, there is an intellectual fad that claims that most science is politically motivated and that imputation and analysis of these motivations is a worthy scholarly enterprise. This mostly amounts to calling people racists. The prospect of it all is that we may find the English department at our universities in charge of research policy if they don't find a new fad.

All of these books are well worth reading. For those interested in the history of the study of human diversity, I recommend the Shipman book. Although Marks' book may provide some different perspectives, I frankly don't trust it because of its ideological cant. For example, Shipman's description of the reception of Carleton Coon's *Origin of Races* is fair, evenhanded, and accords with my own knowledge of what happened, whereas Marks' narrative about the same events does not ring quite right to me.

The Bell Curve is dull reading, but the information it presents is centrally important to a lot of people in business, education, and government. Anyone familiar with the literature on testing will recognize what has been well known for decades, supplemented with new tabulations from the NLSY database. Rushton's book, on the other hand, is anything but dull. Some of it is, I think, far-fetched, like some of his genetic similarity theory and some of his account of ecological theory, but it should not be shouted down and dismissed.

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Race, Reason, and Rationale

Race has been a core concept in anthropology since the inception of the discipline. For the last century, anthropologists have grappled with the problem of racial analysis with little success. Now, at a time when race has been abandoned by 50% of biological and 70% of cultural anthropologists,[1] four books have emerged to renew interest in its value and use as a tool for scientific research on human diversity. These books address issues of race and racial classification in different ways, from different perspectives, and with different agendas.

Pat Shipman and Jonathan Marks deal with the history of race and the study of human diversity. Although both authors examine the scientific and political factors in the study of biodiversity, they reach disparate conclusions. J. Philippe Rushton uses a life-history approach in which reproductive adaptive strategies of races are seen as driving evolutionary changes in morphology and behavior. These reproductive differences define races and allow us to rank order them. Richard Hernnstein and Charles Murray's contribution is more narrowly focused on the impact of intelligence quotient on race and class. They see racial and class differences as being deeply imbedded in immutable, genetically determined measures of intelligence. This interpretation has become an important part of the public policy debate that is at the heart of political decisions being made in the United States.

The questions about race and its role in understanding human biodiversity are not trivial. As the philosopher N.W. Pirie[2] noted, the answers to such questions are indispensable:

> Some people think that the philosophy a scientist accepts is not of very much importance; his job is to observe the phenomena. This is a gross oversimplification and it involves the subsidiary hypothesis that all scientists are fully equipped with serendipity. A sensible philosophy controlled by a relevant set of concepts saves so much research time that it can nearly act as a substitute for genius.... A scientist can have no more valuable skill than the ability to see whether the problem he is investigating exists and whether the concepts he is using are applicable (p. 280).

Pat Shipman begins her discussion of the evolution of race and racism by recounting Darwin's contribution to evolutionary theory. She neglects any discussion of contributions from the previous century, during which race gained scientific and political prominence. Shipman does not extensively discuss the definition, history, development, or evolution of race or, for