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J. PHILIPPE RUSHTON<sup>1</sup>  
*University of Western Ontario*

Ehrlich's central thesis—that there is not just one human nature but many—seems eminently reasonable on the surface. But Ehrlich sidesteps the most convincing evidence! Although he proposes that “*Genes and environments work together* in creating the mind” (p. 122, emphasis in original), his take home message is the title of one of his chapters, “The dominance of culture.” Ehrlich's attempted rebuttal of the straw man of “genetic determinism” singularly fails to review the very large number of twin and adoption studies showing that people inherit their behavior as well as their appearance. As almost everyone now accepts, especially in the wake of the Human Genome Project, genes plainly *do* contribute significantly to people's temperaments, abilities, and patterns of interest. They even help create the individual differences in empathy, altruism, and aggression (Rushton et al., 1986) Ehrlich preaches so much about. But rather than review these data and tell his readers what, if anything, is wrong with them, he relegates them to a footnote, as when he dismisses Professor Tom Bouchard's famous studies of similarity in identical twins raised apart, arguing that such similarities have been over-estimated (p. 419, n. 92).

Ehrlich becomes especially tiresome when he repeats the mantra that human races do not exist. Following in the footsteps of Jared Diamond (who wrote a blurb for the cover), Ehrlich attempts to dismiss the genetic argument over race and sex differences simply by branding it “racist” and “sexist” (pp. 293–298). I have extensively reviewed Diamond's *Guns, Germs, and Steel* previously in this journal (Rushton, 1999), but because Ehrlich's book commits the same egregious errors and omissions in order to force feed a similar culturally determinist point, I will repeat some of that material here. These scientific data need to be presented again and again until evolutionary biologists like Ehrlich, Diamond, Gould, and others who

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get easy access to the general public begin to tell the public the whole truth. It is incredible that so distinguished a set of scientists are so willing to deny reality.

Consider the following sets of data which I have reviewed most thoroughly in my book *Race, Evolution, and Behavior* (2000, now in its third edition). If race was an invalid concept and genes had little or no predictive power, the findings I summarize would not be so consistently found. For example, although IQ tests were invented by Whites and standardized on mainly White populations, dozens of studies now show that East Asians, whether tested in North America or in Pacific Rim countries, typically average higher than Whites, scoring in the range of 101 to 111. Caucasoid populations in North America and Europe typically average a mean IQ of 100. African populations living south of the Sahara, in North America, in the Caribbean, and in Britain typically have mean IQs of from 70 to 90.

Parallel differences are found on relatively culture-free tests such as speed of decision making. All children can perform the task in less than one second, but children with higher IQ scores perform faster than do those with lower scores. Asian children in Hong Kong and Japan average faster than do European children from Britain and Ireland, who in turn average faster than do African children from South Africa.

Moreover, and despite Ehrlich's attempt at obfuscation, the heritability of intelligence is now well established by numerous independent adoption, twin, and family studies. Particularly noteworthy are the heritabilities of around 80% found in identical twins reared apart (Bouchard, Lykken, McGue, Segal & Tellegen, 1990). Moderate to substantial genetic influence on IQ has also been found in studies of non-Whites, including African Americans and Japanese. Even the most critical of meta-analyses find IQ about 50% heritable (Devlin, Daniels & Roeder, 1997).

Transracial adoption studies provide strong evidence for a genetic contribution to the between-group differences. Studies of Korean and Vietnamese children adopted into White American and White Belgian homes show that, although as babies many had been hospitalized for malnutrition, they grew to excel in academic ability with IQs 10 points or more higher than their adoptive national norms (Frydman & Lynn, 1989). By contrast, Weinberg, Scarr and Waldman (1992) found that at age 17, Black and Mixed-Race children adopted into White middle-class families performed at a lower level than the White siblings with whom they had been raised. Black children averaged a lower mean IQ than did Mixed-Race children and this was true even when the adopting parents misclassified them as being Black or Mixed Race.

Ehrlich fails to mention that IQ scores are related to brain size. A series

of truly remarkable studies during the 1990s 'decade of the brain' using magnetic resonance imaging (MRI), construct three-dimensional models of the brain *in vivo*, and plainly show an overall correlation of greater than 0.30. Over a dozen of these are listed in Rushton (2000; e.g., Flashman et al., 1998; Gur et al., 1999; Tan et al., 1999; Pennington et al., 2000; Wickett, Vernon & Lee, 2000). They corroborate the lower, but still significant correlations ( $r = 0.20$ ) that have been found for over a hundred years using external head size measures.

Racial differences in brain size, another topic omitted entirely by Ehrlich, have been established using four quite different procedures: MRI, autopsies, endocranial volume, and external head measures. The brains of East Asians (Koreans, Chinese, Japanese) and their descendants consistently average larger (about  $17 \text{ cm}^3$ ) than those of Europeans and their descendants, and  $97 \text{ cm}^3$  larger than those of Africans and their descendants. Using MRI, Harvey et al. (1994) found that 41 Africans and West Indians had a smaller average brain volume than did 67 Caucasians. Using brain mass at autopsy, Ho et al. (1980) summarized data for 1,261 individuals and reported a mean brain weight of 1,323 grams for White Americans and 1,223 grams for Black Americans. Beals, Smith and Dodd (1984) analyzed 20,000 skulls from around the world and showed that East Asians, Europeans, and Africans averaged cranial volumes of 1,415, 1,362, and  $1,268 \text{ cm}^3$  respectively. Rushton (1992), calculated cranial capacities from external head measurements in a stratified random sample of 6,325 U.S. Army personnel and found that Asian Americans, European Americans, and African Americans averaged 1,416, 1,380, and  $1,359 \text{ cm}^3$ , respectively.

Are these findings attributable simply to race differences in body size? The world database from: (a) autopsies, (b) endocranial volume, (c) head measurements, and (d) head measurements corrected for body size was summarized by Rushton (2000, pp. 126–132, Table 6.6). The results in  $\text{cm}^3$  or equivalents were: East Asians and their descendants = 1,351, 1,415, 1,335, 1,356 (mean = 1,364); Europeans and their descendants = 1,356, 1,362, 1,341, 1,329 (mean = 1,347); and Africans and their descendants = 1,223, 1,268, 1,284, and 1,294 (mean = 1,267). The review found the overall mean for Asians to be  $17 \text{ cm}^3$  more than that for Europeans and  $97 \text{ cm}^3$  more than that for Africans. Within-race differences, due to method of estimation, averaged  $31 \text{ cm}^3$ .

Contrary to Ehrlich's dominance-of-culture theory, these racial differences in brain size and intelligence show up early in life. The National Collaborative Perinatal Project followed more than 35,000 American children from birth to age seven. Rushton (1997) analyzed these data and found that at birth, four months, one year, and seven years, Asian Americans aver-

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aged larger cranial capacities than did Whites, and Whites averaged larger cranial capacities than did Blacks. In all three races, head circumference and IQ correlated  $r = 0.20$  at seven years of age and the Asian American children averaged an IQ of 110, White children an IQ of 102, and Black children an IQ of 90. Moreover, Asian Americans, who averaged the largest craniums, were the shortest in stature and the lightest in weight, whereas Blacks, who averaged the smallest craniums, were the tallest in stature and the heaviest in weight. Once again, the race differences in brain size were not due to body size (see Rushton & Ankney, 1996, for review).

Changes in brain size have cascading effects on other traits, for example running ability. As reviewed in Rushton (2000), East Asians have wider hips than Whites or Blacks which gives them a less efficient stride. The reason why they have wider hips is because they give birth to larger brained babies. During evolution, increasing cranial size meant women had to have a wider pelvis.

Greater brain growth also relates to slower maturation. White babies are born a week later than Black babies, yet they are less mature as measured by bone development. Black babies mature more quickly than White babies, while East Asian babies mature more slowly. Two-day-old African babies placed in a sitting position are often able to keep their heads up and backs straight. White babies often need six to eight weeks to do these things.

A parallel pattern of differences is found on a total of 60 other traits, including sex hormones, twinning rate, sexual behavior, personality and temperament, family stability, and rates of violent crime documented in *Race, Evolution, and Behavior* (2000), as well as an evolutionary explanation based on life history theory and the Recent-Out-of-Africa Model of Human Origins for this consistent pattern. Although Ehrlich (pp. 94–101) describes the accumulating evidence in favor of the “Out-of-Africa” theory of human origins, holding that *Homo sapiens* arose in Africa 200,000 years ago, expanded beyond Africa in an African/non-African split about 100,000 years ago, and then migrated east in a European/East Asian split about 40,000 years ago, he refuses to examine the relation between this evolutionary sequence and the parallel ranking of Africans, Europeans, and East Asians in brain size and other behavioral traits. Nor does he even suggest to his readers that evolutionary selection pressures might have been different in the hot savanna where Africans evolved than in the cold Arctic where East Asians evolved.

How could the group differences in brain size and intelligence have arisen? Does Ehrlich want to argue that natural selection stopped when anatomically modern humans arose in Africa over 100,000 years ago? Or

when some groups entered the winter environments some 60,000 years ago? Wouldn't we expect the evolutionary process to have different effects in different environments? In the wake of the success of *The Bell Curve* (Herrnstein & Murray, 1994), and other recent books about race (Jensen, 1998, Rushton, 2000) that provide race-realist answers to the question of differential group achievement, there has been an intense effort to get the 'race genie' back in the bottle. Its tragic when a scientist with so many accomplishments and so Herculean a reputation as Ehrlich takes it upon himself to assume so Sisyphean a task.

### ENDNOTE

1. Please address correspondence to J. Philippe Rushton, Department of Psychology, Social Science Center, University of Western Ontario, London, Ontario, Canada N6A 5C2.

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DOUGLAS JONES<sup>1</sup>

*University of Utah*

Paul Ehrlich is a respected and prolific professional evolutionary biologist, but he is probably best known to the general public as the author of *The Population Bomb*. This 1968 best-seller presented a wildly alarmist view of the dangers of population growth, arguing that the best the world's people could realistically hope for over the next few decades was some combination of authoritarian controls on reproduction and a massive die-off through famine, war, pollution and epidemic disease. (The worst was extinction.) Whether he is feeling abashed about his earlier career as a herald of demographic apocalypse, or whether he's just gotten mellow with age, Ehrlich has turned down the volume a lot in his latest popular book.

*Human Natures* is several works. It is a well written, profusely foot-noted, fast paced survey of a huge sweep of biological and cultural evolution. It is a humdrum set of reflections on the current state and future prospects of the species. And, scattered through the other two works, it is a mildly tendentious and unpersuasive essay directed against evolutionary psychology and behavior genetics. The biggest and best part of *Human Natures* is a survey of evolution and human history. A huge amount of material is covered here. Ehrlich begins by introducing the basics of evolution, natural selection, and biological diversification. He then takes up human biological evolution, starting with non-human primates, and moving on to the transition to bipedalism, through australopithecines, *Homo erectus*, Neanderthals, and the expansion of modern humans out of Africa. Two more chapters cover evolution, psychology and the brain, and the evolution of language. Biocultural aspects of hunting and gathering, sex