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# Book reviews

**The Emperor's New Clothes: biological theories of race at the new millennium.** Joseph L. Graves Jr. Rutgers University Press, New Brunswick, New Jersey. 2001. Pp. 252. Price $22.40 hardback. ISBN 0-8135-2847-X.

Graves joins a chorus of voices in the human genome project in asserting that biological races do not exist. Ironically, some leaders in the human genome project want racial identifiers on DNA samples from which molecular genetic polymorphisms are to be discovered. The population geneticist, Luigi Cavalli-Sforza, also calls for abandoning the traditional classification of races, but at the same time, his groupings of human 'populations' in *Genes*, Peoples, and *Languages* are close to racial groups as originally conceived. Despite its many detractors, a concept of race keeps returning and finding uses.

Graves' attack on the concept of race is polemical in tone. He is clear on where he stands from the outset: biological races do not exist. Scholars who believe that biologically-based racial differences may exist in behavioural traits he labels as 'racists.' This *ad hominian* name-calling is apt to put those on the other side of debate on the defensive. Graves is not seeking a dialogue but rather intends to discourage the use of racial categorizations.

His book is divided into four sections. The first three sections are historical in their coverage. Chapters 1–3 deal with pre-Darwinian theories of race. Chapters 4–6 give coverage to Darwin's beliefs about race, social Darwinism, and the eugenics movement. The third section, consisting of another three chapters, attributes many harmful social movements to a misapplication of racial ideas. Part 4 is the section of the book most critical to Graves' whole line of argument. In chapters on 'Race and the IQ Fallacy', 'Race and the Disease Fallacy', and Can We Do Without Race?', he updates the book to include modern knowledge about the molecular basis of genetic polymorphisms. The book also contains chapter footnotes and reference sources. The writing style is generally accessible. His historical examples document many of the horrors that have been perpetrated in the name of racial superiority.

Graves' push for abandoning the racial concept partly depends on his using a definition of racial group that is extremely restrictive, requiring that races have '...hereditary features shared by a group of people and not present in other groups' (p. 5). However, the definition from the American Heritage Dictionary, which he offers on the following page, emphasizes race as a genealogical line, a lineage, and offers that races differ '...in the frequency of hereditary traits' (p. 6). Racial groups are like a large extended family; people in them share a common ancestry, are somewhat inbred, and share some physical resemblance because of their common genes. Natural selection has produced marked phenotypic differences between racial groups; but large numbers of neutral genetic markers can be used to identify lines of ancestry.

Graves seems to ignore the trait frequency concept entirely. Dutch caucasians (the tallest in Europe), and Japanese Asians differ in mean height because of their different genetic ancestries. That their height distributions may overlap does not invalidate a racial group concept. Similarly, two racial groups could have the same mean on an hereditary trait, but different variances.

In some places, Graves' effort to debunk race falls wide of the mark. In the chapter on IQ, he attacks the idea that blood group B is a gene associated with intelligence (IQ). Scientists currently looking for quantitative trait loci (QTL) associated with IQ, however, do not propose the ABO blood group system as a likely QTL candidate. Graves' inadequate treatment of Jon Entine's book (p. 32–33) on the athletic superiority of African and African-descended athletes leaves the reader with little understanding of Entine's argument. Graves' reasoning on race and disease is unclear. Against the idea of race, he uses some data that were claimed to show that Australoids (who these are was not clearly defined) have a higher melanoma rate than other dark-skinned people. Graves recognizes, however, that his collection of populations, from Caucasians in India to Asians in Central America to Australoids, do not constitute one ancestral grouping and is not a single race by any stretch. Thus, his critique merely shows that when race varies among dark-skinned peoples, so do melanoma rates, hardly a counter to a concept of race. Race cannot be defined on the basis of one phenotypic characteristic. On the other hand, I accept Graves' implication that one needs to be cautious before using single genes to explain racial differences in complex traits.

In summary, this book is unlikely to convert those who find a racial concept useful, but it may play well to a growing choir denying that race exists. My own guess is that a racial concept, although sometimes in the guise of another name, will remain in use in biology and in other fields because scientists, as well as lay persons, are fascinated by human diversity, some of which is captured by race.

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**The Hierarchical Genome and Differentiation Waves — Novel Unification of Development, Genetics and Evolution (2 vols).** Richard Gordon. Imperial College Press, London. 1999. Pp. 1835. Price £108.00, hardback ISBN 981022268 8.

I am not a developmental biologist, nor am I physicist or a mathematician. Yet as a molecular biologist, I managed to not

only read both volumes of this 'magnus opus' by Professor Richard Gordon but to actually enjoy the rich tapestry of historic anecdotes and multidisciplinary tangents this book provides. The writing style used is that of a doctoral thesis, which may lack elegance but works well as means of communicating the complicated matrix of ideas presented in this book. Richard Gordon is a complex man with diverse and sometimes controversial views; and his writing gives one the impression of strolling through such a mind, complete with almost unimaginably dense and thorough references for each point along the way. This journey will take the reader through the theoretical world of 'morphogenic waves' and 'cell state splitters', a world championed by the lowly axolotyl and a world where we are challenged to consider a spherical cow. For those who choose to take up the challenge of reading this considerable work, a long and sometimes surprising journey lies ahead.

The book opens with a historical overview of the discipline of embryology, as a means of introducing the terminology required to navigate this book. To this end, Gordon does an admirable job and whether you accept or even understand his final hypothesis regarding cell-state splitters, nuclear tensegrity and the physics behind morphological changes in the embryo, these first few chapters are worth buying the book alone. There is even a helpful glossary of terms, many of which seem to have been relegated to embryology at sometime in the murky past before molecular biology and its associated terminology began to proliferate. We are also reminded in the first chapters that DNA and the genes encoded in it do not an organism make. To the contrary, temporal and spatial (physical) information also play a major role in the determination of cell lineages and morphogenic changes in the embryo. More importantly, we are reminded of the importance of hypothesis-driven science and model building versus dogmatic scientific enquiry as personified by vitalism at the turn of the century.

Having equipped his readers with a thorough introduction to embryology, Gordon then begins to outline his views on development, evolution and finally the hiearchical nature of the genome as it might relate to morphogenic or differentiation waves in embryos. To help him accomplish this goal he continues to use extensive quotes from the literature and, at one point, a flip-style animation of a differentiation wave in the axolotyl embryo. Gordon's use of quotations, rather than the paraphrasing of previous work, does take time to adjust to; it works well in the earlier chapters but becomes more tedious near the end of the book.

Originally, I was interested in this book's treatment of genome evolution and stability, which are introduced to support the idea of differentiation trees. Gordon points out the hierarchical nature of the genome, citing gene duplication and gene clustering as a means of exchanging or creating developmental units (e.g. the *HOX* gene cluster) that control major morphological changes in the embryo (i.e. segmentation). As we move into the post-'Human Draftome' era it seems very timely that this book should be discussing development on a genomic level, much in the same way that molecular biologists have begun to look at genome-wide gene and protein expression in the attempt to understand cellular metabolism. Conceptually differentiation trees, or hierarchical and functional units of the genome, are quite appealing. What may be harder for the reader to accept is whether the cascades of genes encoded in these differentiation trees can be triggered by changes in the physical forces to which the embryo is subjected, balanced ultimately by the cytoskeleton within each cell. To conclude, this book is a long and sometimes convoluted synthesis of evolution, developmental biology and genetics. Yet, whether you accept the ideas presented in this book or not, I prefer to take a more Doaist approach. For it is not whether you finish the book or even accept the ideas presented, simply making the journey of reading it, as I found, may be rewarding enough in itself.

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# Books received

**Human Chromosomes (4th. edn).** Orlando J. Miller and Eeva Therman. Springer-Verlag, New York. 2001. Pp. 501. Price $44.95, paperback. ISBN 0-387-95046.

**Frogs, Flies, and Dandelions, The Making of Species.** Menno Schilthuizen. Oxford University Press, New York. 2001. Pp. 245. Price $20.00, hardback. ISBN 0-19-850393-8.

**Future Perfect: confronting decisions about genetics.** Lori B. Andrews. Columbia University Press, New York. 2001. Pp. 264. Price $19.96, hardback. ISBN 0-231-12162-8.

**Broadening the Genetic Base of Crop Production.** H.D. Cooper, C. Spillane and T. Hodgkin (eds). CABI Publishing, Oxford. 2001. Pp. 452. Price $140.00, hardback. ISBN 0-85199-411-3.