nonimmunodeficient), the virus remains confined to the respiratory tract.

It is also recognized that canine adenovirus 1 can cause immune complex disease in which bulky antibody-antigen (adenovirus) complexes form in the walls of small blood vessels (*3*), one obvious clinical manifestation of which is corneal edema ("blue eye"). Such complexes fix complement (a serum protein complex), and if the amounts of antigen (virus) were massive, this could result in a generalized immune-complex-type reaction.

It is not clear from Marshall's article what the antibody status of Jesse was to any of the human adenovirus serotypes, including the virus type used to construct the vector he received. The article indicates that there may have been defects in his bone marrow hemopoetic precursor cells, and it is in these cells that the genetic defect in immune-deficient Arabian foals is manifest (*4*).

The observations of generalized (that is, systemic) tissue tropism of adenoviruses in dogs, chickens, and foals; of the capacity of adenoviruses to form immune complexes that could, if massive enough, trigger disseminated intravascular coagulation; and of the extended pathogenicity of adenoviruses beyond the respiratory tract in immunocompromised animals could perhaps guide further attempts to achieve correction of the many human genetic defects that are candidates for adenovirus gene therapy.

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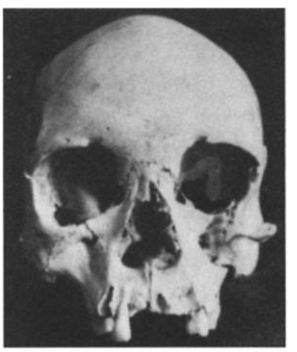
Luzia Is Not Alone

In the News Focus article "Australasian roots proposed for 'Luzia'" by Constance Holden (19 Nov., p. 1467), a discussion of my long-term studies about the morphology of the first Americans includes comments from two North American colleagues to which I wish to respond.

Tom Dillehay, from the University of Kentucky, Lexington, says in the article that the results I obtained from Luzia, which I suppose is the oldest human skeleton found in the Americas (dating from 11,000 to 11,500 million years ago), are "very preliminary," and that the archaeological evidence associated with the African-looking skull "is no different from what you see at sites with nonanomalous skeletons." And Leslie Freeman, from the University of Chicago, refers to "sparse skeletal evidence." Luzia, however, is just one of many South American Paleo-Indian skulls I have been investigating since the end of the 1980s. And all studies preceding and subsequent to the analysis of Luzia have generated the same result: The first South Americans have a marked morphological affinity with present-day Africans and Australians, showing no resemblance to present Asian Mongoloids or American Indians (*1–8*).



Ancient South American skull Luzia, excavated in Brazil.

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My studies with several South and North American collaborators have involved almost 15 specimens dated between 8500 and 11,500 million years ago from places as different as Central Brazil, Colombia, and Tierra del Fuego (Chile). Our

analyses have also included more than 30 putative ancient South American specimens, some of them showing a high degree of fossilization. Different multivariate statistic tools have been used in these studies with complete convergent results.

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We Aren't Worth a Mention?

Floyd E. Bloom's "Endless pathways of discovery" seems remarkably constrained to eliminate discovery of much of human behavior, social organization, and many features of what constitutes being human (Editorial, *Science*'s Compass, 14 Jan., p. 229). The nature that, in Stephen Jay Gould's introductory essay to the series (p. 253), an advancing but very human science seeks to understand seems peculiarly devoid of human beings beyond the molecular or cellular, as the iconographic borders indicate. Bloom says that "the editors retain credit for any errors, omissions, or overemphases," or perhaps discredit for a timeline devoid of Adam Smith, Thomas Malthus, Karl Marx, George Perkins Marsh, Sigmund Freud, Max Weber, Franz Boas, John Maynard Keynes, Noam Chomsky, and Ester Boserup, to name a few.

In Gould's essay, where he tries to disperse the "false dichotomies of the science wars," he observes that "science, as a quintessentially human activity, must reflect a surrounding social context...." It is difficult to understand the social context that encourages pathways of discovery that lead everywhere but to ourselves.

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Economics of Bushmeat

There is growing evidence that commercial hunting of wildlife for sale as food is a more immediate threat to wildlife conservation and species survival than is habitat destruction throughout most of the tropical forested regions of the world, a topic discussed in the Policy Forum "Wildlife harvest in logged tropical forests" by John G. Robinson, Kent H. Redford, and Elizabeth L. Bennett (*Science*'s Compass, 23 April 1999, p. 595) and elsewhere (*1*, *2*). Attempts to reduce or halt overexploitation of wildlife have focused on the supply side of the commercial bushmeat trade. Most interventions emphasize law enforcement to curb hunting and transporting of meat to markets, particularly within the context of commercial logging that greatly facilitates the bushmeat trade (see Robinson, Redford, and Bennett's Policy Forum).

We know little about how consumer demand for bushmeat responds to the price of bushmeat and of its substitutes, or to changes in household income. If the quantity of bushmeat demanded by consumers does not respond to large changes in the price of bushmeat, then present command-and-control measures to constrain the supply of bushmeat, or efforts to increase production of livestock alternatives to bushmeat, at best will have a modest effect on wildlife conservation. If the consumption of game, like the consumption of firewood or charcoal, declines when incomes grow, then economic prosperity could enhance wildlife conservation.

Preliminary evidence from household surveys in Boliva and Honduras suggests that bushmeat consumption follows an inverted U pattern with income, increasing as income rises from a low initial base, but then

Iguanas are common bushmeat fare in Honduras.

declining. Consumption also declines strongly when the price of bushmeat increases and that of bushmeat substitutes falls.

At least three specific lessons for policy-makers and donors could be gleaned from these results. First, economic development might result in enhanced wildlife conservation if household incomes rise fast enough and high enough to shift bushmeat from a necessity to an inferior good. Second, given the high own-price elasticity of demand (the change in demand for an item as the price of that item changes) for bushmeat, any factor that lowers the cost of hunting (for example, new weapons or cheaper market access) will increase hunting effort and thus the impact on wildlife. But any activity that raises the opportunity costs of labour could counterbalance the negative affects of new technologies. Last,

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