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Demographic Thinking

In his commentary "The future of human longevity (*Science*'s Compass, 17 Apr., p. 395), John R. Wilmoth aptly captures the spirit of demographic thinking as well as the current demographic consensus. For nearly all demographers, a U.S. life expectancy of 85 in the year 2050 is well within the bounds of uncertainty. Life expectancy is heavily influenced by mortality early in life. Furthermore, life expectancy is a synthetic measure of *current* mortality conditions in a particular year: It is calculated by fixing age-specific death rates at prevailing levels. Hence, it is useful to examine other measures of longevity. Half of the babies born in the United States and other developed countries this year may survive to age 91. Half of the white female babies may live to celebrate their 95th or 100th birthday (depending on whether extrapolations are based on data from the past eight or the past three decades) (*1*). Although these are simply alternative ways of expressing the data summarized by Wilmoth, this perspective may be more illuminating. Demographers argue about details, but most agree that improvements in mortality at older ages will probably lead to very rapid growth in the number of octogenarians, nonagenarians, and centenarians, considerably more rapid than the official forecasts of the Social Security Administration (J. W. Vaupel *et al.*, 8 May, p. 855)(*2*).

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Bird, Dinosaur Link

Ann Gibbons's Research News article "Missing link ties birds, dinosaurs" about the discovery of the unusual Cretaceous bird *Rahonavis* (née *Rahona)* (20 Mar., p. 1851) includes commentary from two scientists who doubt that the forelimbs and hindlimbs belong to a single animal. One of the authors of the original report (20 Mar., p. 1915), Catherine A. Forster, is quoted in response that a source from two different animals cannot be ruled out, although "she contends that the hind limbs are clearly bird legs."

In fact, the study itself shows a stronger test of this hypothesis (Forster *et al.*'s note 22, p. 1919) that was not reflected in the News article. Phylogenetic analyses were run twice, once including the questioned forelimb ma-

terial, which was found "next to or touching the hind portion of the skeleton," and once without it. In both cases the phylogenetic position of *Rahonavis* was the same, clustering with *Unenlagia* plus *Archaeopteryx* and other birds. This shows clearly that the fore and hind limbs belong to the same animal, unless they represent two different kinds of animals with exactly the same evolutionary relationships to other groups (which would amount to nearly the same thing).

Critics of the dinosaurian ancestry of birds are quoted as characterizing *Rahonavis* as "a little dinosaur hindquarter, with a bird's forelimbs," or as "another dinosaur trying to hit it big as a bird." The kinds of analysis that Forster *et al.* carried out indicate that these critics are closer to the mark than they would like to be, because the overwhelming evidence indicates that birds did indeed evolve from dinosaurs (*2*). As evolutionary theory would predict, the most basal birds show a mosaic of retained theropod features and new avian characters.

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Science in Vietnam

I read with interest the recent informative coverage of "Science in Southeast Asia" (Special News Report, 6 Mar., p. 1465). However, I wish that Vietnam had been part of the survey. While Vietnam is poor compared with other Southeast Asian countries, it has great potential. After years of wars and isolation, Vietnam is only gradually becoming reintegrated into the world, but its scientists have been making their presence known internationally for years. Despite enormous difficulties, including severe constraints in funding and inadequate infrastructure for research, Vietnamese universities have managed to produce fine mathematicians, physicists, medical researchers, agricultural experts, and engineers, many of whom are highly respected in their fields. The newly created Vietnam National University is expected to play a critical role in the future development of Vietnamese science.

Vietnamese scientists currently working in industrialized countries, particularly North America and Europe, have made important contributions in computer science, mathematics, aerospace engineering, chemistry, and medical research. They have also participated in space exploration in the astronaut program.

The Vietnamese have a tremendous love of higher education and a tremendous passion for learning. However, they have received sporadic assistance from the industrialized world. In view of Vietnam's current reentry into the international community, it is now perhaps time for Vietnamese science to be given due attention.

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A Good Estrogen

Robert Service's article "New role for estrogens in cancer?" (Research News, 13 Mar., p. 1631) reminds us of the dark side of estrogen metabolites in promoting cancers. However, a major estrogen metabolite, 2-methoxyestradiol ($2ME_2$), represents the bright