Fur, Lice, and History

In his contribution to the discussion on the evolution of hairlessness in man, Olson (Letters, 22 July, p. 364) suggests that disease-causing agents transmitted by ectoparasitic vectors may have selectively "wiped out the entire fur-bearing segment of the human population" because "the nonhairy members of the population probably took great pains to rid themselves" of body lice and ticks (the latter, by the way, are not insects) while their "furry cousins probably never could delouse or detick themselves." There are several lines of evidence derived from studies of modern hunter-gatherers and nonhuman primates which, in my opinion, make Olson's imaginative proposal untenable or at least improbable.

There is, first, the matter of grooming. Modern fur-bearing primates, with few exceptions (for example, the spider monkeys), are efficient delousers and detickers. Records for fleas, lice, and ticks on apes and monkeys, regardless of their state of arboreal or terrestrial adaptation, are rare for most species and extremely rare for species that indulge in mutual grooming activities. Fur-bearing primates are no less adept than hairless men in removing ectoparasitic visitors. Presumably this was also true for early, hairy hominids.

Second, man may actually have increased his ectoparasite burden, and the potential for transmission of disease-causing agents, by providing—particularly for lice—a rich array of clothing microhabitats as a substitute for body hair, and by providing—for other arthropod parasites which do not remain on the mammalian host continuously—an elaborate nest (the shelter, cave, or house). Early, presumably hairy, hominids probably harbored one variety of the louse, *Pediculus humanus*, which roamed through the hair forests of all body surfaces. Today man harbors two varieties, one adapted particularly to life on the scalp, the other to the body and to clothing where the eggs are deposited.

Third, all available data suggest that vector-borne epidemic diseases capable of "wiping out" segments of human populations must have been exceedingly rare prior to the development of agriculture and urban ways of life, with consequent increases in human population density and disruption of the natural environment. Hunt-

er-gatherer population units are necessarily small and geographically dispersed; furthermore, these populations function (or have until recently) in relatively stable ecosystems. Vectors and infectious and parasitic agents of disease are also components of such systems. In the stable situation, transmission of autochthonous agents, especially by ectoparasites, is sporadic and focal—the diseases are endemic. New human susceptibles, appearing on the scene infrequently as newborns or migrants, will die sporadically, or survive as relative or absolute immunes. Epidemics undoubtedly occurred among the early hominids, as they do (rarely) among the modern hunter-gatherers and primates in undisturbed settings, but the majority of these epidemics must have been caused by agents transmitted by unspecialized, direct, respiratory and contaminative routes. Only agents of this kind can readily be introduced from outside into a stable ecosystem and a wholly susceptible population. Epidemics caused by vector-borne agents must have been rare, as is true among the modern primates and hunter-gatherers; and within the vector-borne group, epidemics due to transmission by ectoparasites must have been extremely rare.

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Gerontocracy

In *Science* (12 Aug. p. 723) it is reported, as it was too in the daily press, that the Fermi award for 1966 will be shared by three venerable nuclear scientists. It is not to belittle the immense merit of these scientists, but one cannot help being struck by the age of the happy laureates: respectively 87, 87, and 64, average: 79. I feel it is a pity to distribute such important awards to people already covered with honor, respect, and consideration when so many valuable young scientists await in vain any recognition of their efforts. I thought up to now that "gerontocracy" was the privilege of our old European civilizations. This event makes me change somewhat my opinion.

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