
Human Behavior and Evolution Society

Volume IV, No. II

September, 1995
Editor: Elizabeth M. Hill

The View From The President's Window

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Impressions from the Santa Barbara Meeting

For me, meetings have two functions. The standard one is to acquire new information from presentations and conversations. But the real reason I go is inspiration, which seems to come not from individual presentations but from some overall effect. Maybe it's the gradual comprehension of the number and variety of sharp minds working toward synthesis, with competitiveness and cooperativeness flavoring the effort. I suspect everyone knows what I mean. I came home from this meeting with both information and inspiration, but the inspiration is much the more important.

I am only going to talk about one huge positive thing from the meeting, and this is that I began to realize, as the days went on and the talks kept telling me new things, that a remarkable number of people actually are trying one way or another to create a new synthesis -- a new big picture of the human species that will replace nearly everything we have thought across history. We need that new mythology -- in Doris Lessing's sense (*African Laughter*) that myth does not mean an absence of truth but a concentration of truths. We need to replace the old fuzzy notions about how humans evolved (menopause, concealment of ovulation, altriciality, paternal care, and all the rest) such that all of the features of the species fit with one another in functional terms, yielding a coherent picture and eventually showing us the nature of the whole human puzzle. As the talks demonstrated, this synthesis is coming from two sources: knowledge of the past from archaeology, paleontology, and geology; and comparative study of living humans (and other organisms) that not only help with patterns of phylogeny (and vice versa) but provide understanding of the cumulative effects of the process of evolution. To people who have insisted across the years that, in the end, humans cannot be understood as products of evolution, I say, "Stay tuned."

I also had some less positive thoughts that may be worth mentioning. First, I heard a number of presentations that took the form of an outline of topics, sometimes very sophisticated and detailed, projected on the screen,

and then simply talked through. Some such presentations seemed to me to lack data, evidence, argument, hypothesis generation or testing, or any other relationship to science (reminding me of Sulloway's comment about folks who think science is a topic rather than a method). These expositions seemed to me the kind of "take it on faith" presentations that some lecturers unfortunately perpetrate on undergraduates (and some preachers on congregations). I think it would be positive for everyone if a powerful effort were made to detect such presentations in the abstract stage, and also if everyone were worried that his or her presentation might be so judged and as a result worked especially hard to make sure it isn't true. I am not complaining here about arguments and explanations and logic, but about parades of unsupported assertions. I believe that because our topic is humans we should make special efforts to keep the meetings and the publications scientific -- meaning that we ought always to be forming hypotheses and testing them, and that everyone should view even his or her own favorite hypothesis as something to attack, and to falsify if it can be done.

I was also bothered by what I saw as a tendency to treat underlying mechanisms of behavior (psychological mechanisms, mental modules, or whatever) as entities that simply appear full-blown (hence are likely to be thought of as "genetic" or invariable -- even as "instincts" in the jargon of a half century ago). In other words, I want to repeat the admonition that you don't understand human behavior well enough if you don't know anything about its development. Mental modules -- whatever they may be -- may take slightly (or greatly) different forms if developmental stimuli vary. I am probably evangelistic in my advocacy of studies of development as the wave of the future in behavioral biology (actually, in biology as a whole), and as the way to understand a good part of the reasons too many psychiatrists, lawyers, police, and jailers can make good livings, and child abuse, spousal abuse, and street living are so prominent -- let alone war and its associated atrocities. For example, I suggested (in Betzig et al, *Human Reproduction*) that children are not abused because they are step children *per se* (because their step parents are somehow acting in relation to the absence of genetic relationship) but because some particu-

lar stimuli or stimulus sequences are not fulfilled between *themselves and their step (or real) parents, or because* some asymmetry in their social relationships with their two different parents, leading to a (simulation of some historically repeated) conflict of interest, has not been identified and sidestepped. This is part of what biologists, at least, call development, and with knowledge it's changeable. As a person with four adopted grandchildren whose ancestors came from the several different ends of the earth, I know that humans can be fooled, in evolutionary (developmental) terms, and that the consequences can be wonderful.

There is also a message here for such as the Supreme Court. In my opinion it is pernicious to use the term "biological" (e.g., as applied to parents) as if it meant (only) "physiological" or "genetic" or some such thing, and as a result(!) is somehow sacred. "Biological" just as appropriately includes "social." "Genetic parents" is clearly the term being sought, and it puts the legal and moral questions in a better focus. As with fathers' knowledge of their children, children's knowledge of their parents is entirely circumstantial, and the relevant circumstances are the sequences of social interactions that we would describe as the development of (this aspect of) social behavior. The questions raised are obviously not trivial. Thus, we evolutionary biologists also often oppose "biological" to "cultural." What on earth can we mean? Is learned behavior not biological?

There is currently much hype associated with molecular biologists finding "a gene" influencing the expression of this or that. I don't slight such advances. But if Dobzhansky was right in 1961 (in: Kennedy, J. S., *Insect Polymorphism*, p. 111) that "Heredity is particulate, but development [the organism] is unitary" -- meaning, as he said, that "Everything in the organism is the result of the interactions of all genes, subject to the environment to which they are exposed. What genes determine is not characters, but rather the ways in which the developing organism [not genes, or groups of genes, but the organism!] responds to the environment it encounters" -- then we should expect that virtually every behavior complex enough to be identified separately will have some heritability associated with its variations. Thus, I wasn't surprised when Bill Cade at Brock University found that selecting among conspecific crickets on the basis of how much time they sang during each 24-hour period revealed heritability in even that variation (*Science*, 212:563). That's part of what I meant when I said in *Darwinism and Human Affairs* that, if you can show virtually always that changing the direction of selection changes the direction of change, you can show that selection is the principal guiding force of evolution. Finding a gene that influences any aspect of a phenotype should not surprise us, nor convince us that the phenotype is unusual in that respect or that a satisfactory answer to some real or perceived problem (diabetes, menopause, whatever) has necessarily been found. Genes that influence this or that trait also influence a whole lot of others, and we cannot avoid dealing with that fact if we're going to use the information geneticists

are providing (I used menopause here because I think more needs to be understood about effects of changes in estrogen levels at mid-life before wholesale adoption of estrogen supplements by postmenopausal women).

My point is that environmental variations during development are also major candidates for explaining variations in the underlying mechanisms of behavior, and therefore its expressions. Consistent and complex information comes from environments as continually and as reliably as from genes; environmental information is as biological as genetic information. Once understood, *developmental environments may often be easier and cheaper* to modify without deleterious consequences than genes. We humans have placed enough novelty in our developmental environments to create diverse circumstances that we need to be able to alter and control intelligently, to virtually everyone's advantage, because in modern environments they can lead to what we call pathologies. Why aren't we as excited about this kind of manipulation? Why should an evolutionary approach cause us to act as though genes are all that counts, or that underlying mechanisms of behavior inevitably take a single, unalterable form? It's a provocative question how "deeply" we have to look to discover any such virtually unalterable forms. Because of my long-term intense interest in this question, I discussed in detail what I saw as an extreme (and perhaps best-known case) in all such mechanisms, underlying cricket behavior, in Thomas Sebeok's *Animal Communication* (1968, pp. 201-212). Thus, we know (1) the minimal portions of the CNS necessary to produce a cricket's acoustical repertoire, (2) in which CNS ganglia the pacemakers responsible for pulse and chirp rate respectively are located, (3) which muscles these pacemakers operate, (4) that multiple genes are responsible for species differences in pulse rates and single genes for chirps (pulse groups) versus trills (continuous streams of pulses), (5) in some cases on which chromosomes the genes responsible for the firing rates of the different pacemakers in different CNS ganglia (i.e., for pulse and chirp rate) are located, and (6) that the firing rates responsible for some signal features apparently cannot be altered during either development or adulthood short of physical mutilation of the necessary portions of the CNS.

My overall thought about HBES and the future is that, if we are to fulfill the mission of getting people in general to think evolutionarily with respect to human behavior, we should want to continue getting bigger and better. A society gets bigger if it attracts more people, and better if it attracts better people. Both are accomplished by raising better questions, by better work explained more successfully. I don't think we're trying to cause everyone to become a member of HBES, or to publish evolutionarily-oriented books and papers of the sort we do, but rather to cause people in general to incorporate evolutionary thinking into whatever they do or think. To accomplish that we need to find ways to increase the interest and understanding of people on the fringes of our "field(s)." Could we help this along through some special kind of inexpensive "associate" membership that entitles people only to, say, receive a newsletter that comes every

month or two and reviews findings and ideas in a semi-technical way? Or is that impractical? How can we use the World-Wide Web to assist in this part of our mission?

That's how I was affected by the meeting. I would appreciate hearing from others how they were affected, what they've been thinking, and what they think about what I've said here.
