Fall 2009 Honors 2013: Evolution and Biology of Morality
John Protevi / Department of French Studies / www.protevi.com/john / protevi@lsu.edu
408 Hodges Hall / 578-6664 /

Notes on Kim Sterelyny and Paul Griffiths, Sex and Death: An Introduction to the Philosophy of Biology (Chicago: University of Chicago Press, 1999). Chapters 1-2.

CHAPTER 1: THEORY REALLY MATTERS:

PHILOSOPHY OF BIOLOGY AND SOCIAL ISSUES

1.1: The Science of Life Itself

S&G want to reclaim the relevance of biology for ethics and social thought. Why do they have to "reclaim" it? Because the reaction against Social Darwinism and eugenics was to adopt the view that biology was irrelevant for ethics.

It's sometimes said that the rich are hard workers and poor are lazy; that is, that character traits are responsible for social position. (Others said it was God's will; there are lots of different stories.) It may also be thought that these character traits have some bodily basis in "bloodlines" or what have you, but it often isn't worked out in a scientific theory.

Social Darwinists thought they could supply just such a scientific theory, by showing that Darwin's evolution by natural selection also applied in society. Successful people (or groups) were those that competed best; social competition was "natural" and its results could only be modified "artificially" by social help institutions like charity hospitals, food giveaways, etc.

The "Social Darwinism" question is complicated because Darwin himself didn't believe in Social Darwinism, which had taken shape as a school of thought before Darwin anyway!

Darwin did say that what he was doing was applying Malthus to nature. Malthus said that population increased geometrically but that food supply only increased arithmetically. Malthusian nature is thus all about individual (intraspecies) competition for scarce resources.

Darwin partially accepted this competition for scare resources idea and defined biological success as number of offspring surviving this filter of "natural selection." But Darwin didn't believe that natural selection involved *only* individual competition and that evolved human nature was thus individual and competitive; he recognized co-operation and social emotions like sympathy as being evolved human traits, because he accepted group selection. For Darwin, human nature was as emotional and social as it was individual, rational, and competitive.

Anyway, the Malthusians thought that the unequal ratio of population growth and food supply growth set a limit to population enforced by starvation and disease as killers. The point that Social Darwinists made is then basically Malthusian: social help institutions for the poor only set us up for a big disaster as population would outstrip food supply. Better to let nature take its course and let poor people die off gradually as they got sick rather than all at once in a horrible starvation / disease catastrophe.

In any event, if you take Malthus's social-economic analysis and apply it to nature and then forget you did the first application, you can then read competition off of nature and claim that individualizing, competitive society is "natural." Remember this structure: 1) project a particular social system onto nature; 2) forget that this is a projection; 3) claim that "nature" legitimates the social system.

Eugenics is a radical reaction to Social Darwinism with a biological determinism presupposition. It's the program of taking charge of human breeding in order to control the problems Social Darwinism diagnoses. Even if we avoid a resource catastrophe, the eugenicists would say, social help institutions let the "inferiors" survive "unnaturally" and thus they will outbreed the superiors and thereby drag human culture down by passing along biologically inherited bad traits (in other words, they take Mike Judge's *Idiocracy* seriously!). So they would say that in addition to eliminating social help, we must take charge of human breeding. This can be oriented to improving the top end (breed the successful ones together) and / or to eliminating the bottom end (stop the unsuccessful ones from breeding).

The problem here is that there is no clear path from what we biologically inherit from our parents to how we "succeed" in society. For one thing, there's a slippage from the biological sense of "success" (number of offspring surviving to reproduction age) to social "success" which has many different definitions. For another, we inherit a lot more than genes from our parents: we inherit a home environment (language, music, toys), nutritional patterns, social position, a network of family and friends, money, school admission ("legacy" admits), etc. And it's really hard to separate the effects of social inheritance from that of biological inheritance. So just changing breeding patterns is not going to get to the causes of reproduction of social inequality (rich vs poor).

1.2 Is there an essential human nature?

Population thinking is anti-essentialist. An essence is a finite list of necessary and sufficient conditions for belonging to a group or "species" as last step down from a "genus." An essentialist species is uniform synchronically and stable diachronically.

But a species defined by population is just a group that breeds together and thus has a common ancestry. There can be lots of variation in a population, lots of traits that some members have but others don’t (or have to a lesser degree). So diversity is foreign to essentialist thinking, but basic

for population thinking. Also, such diversity can accumulate in one direction or another over time, so that a population species can change its traits rather dramatically over time.

When applied to human nature we have to think in population terms, both synchronically (diversity) and diachronically (change). Synchronically, when we take into account "frequency-dependent selection" we see that populations can evolve relatively stable (though constantly shifting within a threshold) sub-populations. The ratio of psychopaths to those with normal social emotions might be an example.

Races then have to be rethought in the shift from essentialism to population thinking. We don't really have closed off populations; there's always some degree of inter-breeding. There's lots of variation within groups (in fact, it's usually said that there's far more difference w/in a group than there is between the means of groups compared to each other). The traits of groups overlap with no clear distinctions. Superficial traits don't really correlate to genetic markers (the population of Finns and Swedes have different gene distributions on average, but they both have white skin).

1.3 Is Genuine Altruism Possible?

This will be one of the major foci of the course, so we can move quickly.

Dawkins et al highlight the problem that gene selectionism would seem to preclude altruism as an adaptation. Yet we seem to see plenty of altruism around us? Is this just an illusion that we can explain away? Or is it real, so that we have to go back and challenge the idea of gene selectionism by that of group selection?

1.4 Are Human Beings Programmed by their Genes?

The question here is biological or genetic determinism. Of course no one is an absolute determinist, such that no environmental influences have any effect whatsoever on the appearance of a genetically determined trait. Rather, most people who emphasize genes talk about normal environments that are just the background for the real action, which is the information carried in the genes. The question obviously gets really complicated when talking about human psychology. Sociobiologists in the 1970s tried to tie specific human behaviors to genes; their descendants are "evolutionary psychologists" who tie psychological mechanisms that tend to produce such behaviors to genes. These mechanisms are "Darwinian algorithms" that are selected for fitness-enhancing effects.

The opposite school is "social constructivism" that says that biology only gives broad constraints. Everyone has a heart and blood and lungs, etc., but past that, it's all culture all the way down.

Sterelyny and Griffiths adopt an "interactionist" viewpoint. The key is that the interaction need not be simply *additive*: an increase or a decrease in one variable (a gene shift or an environmental change) might increase or decrease the outcome. It all depends on the ratios. A

small change in either variable might result in a big change in outcome, depending on the situation. This means the gene / environment relation is often *multifactorial* and *nonlinear*.

1.5 Biology and the Pre-emption of Social Science

Biological theories can constrain social science. If something presents itself and yet conflicts with biological theory (e.g., altruism seems impossible if you assume gene selectionism), then you have to look for ways to explain it away, to show how it's an illusion. Or you have to go back to your biological theory and see whether it doesn't need to be changed (e.g., by admitting group selection).

Biological theories can displace social science. At first, people were happy to divide the labor up and let biology handle the universals and let culture handle the differences. But then the sociobiologists / evolutionary psychologists came along and said we can provide a biological explanation for differences (e.g., between male promiscuity and female coyness).

S&G don't like the division of labor or its attempted overthrow by the EP crowd. Biology and culture can work together rather than be mutually exclusive. Also, we've co-evolved with culture and as cultural. Our biology is to be so open to culture that it becomes second nature. Bio-culturality goes all the way down (neural plasticity is a prime example: we're biological programmed not to have too many set neural pathways at birth; it's our experience that wires us up at the micro-level).

CHAPTER 2: THE RECEIVED VIEW IN EVOLUTION

2.1: The Diversity of Life

VARIATION: If we take human beings as paradigmatic, we go badly astray in thinking about diversity of living beings. Most beings are single-celled organisms. There's no reason for them to evolve further: they are so flexible and move their DNA around so quickly they adapt to all sorts of environments.

Humans are "assemblages of eukaryotic cells": but we also have lots and lots of prokaryotes inside "us." There would be a lot to think about here concerning "individuality."

Design space as library of detailed plans vs virtual space of potentials in interaction with lines of creative actualization yielding metastable fields (eggs / embryos) that are plastic yet guided.

Process structuralists propose constraints on morphogenesis.

Accidents of history also contribute to limitation on possible organic form.

Gould: diversity vs disparity and the conservation of basic body plans (now talked about be evo-devo in terms of conserved Hox genes.)

Species as natural kinds vs illusions via our constrained temporal perceptions.

ADAPTATION: fit of organic traits and environmental problems. Although there are lots of compromises and non-optimality, everyone believes there has been lots of adaptation. The question is how much?

2.2 Evolution and Natural Selection

The widespread acceptance of evolution (change of organic form over time) predates Darwin. What Darwin did was propose natural selection as the mechanism for evolution.

Three principles: 1) phenotypic variation; 2) differential fitness; 3) heritability.

Generation of variation is insensitive to selection pressures. (Otherwise you get Lamarck.) The retention of variation is of course exactly what is meant by selection.

Fitness = number of offspring surviving to reproduction age. Phenotype variation affects fitness and environmental stress (e.g., competition for resources; exposure to predators; disease) is the selective filter, letting those traits with positive fitness effects accumulate. Of course the third requirement is heritability: the fitness-affecting traits that are selected for have to be inherited in order for them to accumulate in succeeding generations.

Note that S&G define heritability (Box 2.2) as measure of resemblance across generations. This neutral definition is different from the usual definition of heritability as the ratio of phenotypic variance due to genetic causes to the total variance in the population. In this way they follow a famous critique of common misunderstandings of heritability conducted by Richard Lewontin: 1) in real environments, it's hard to distinguish the effects of genes from the effects of environment (they interact in multifactorial and nonlinear ways); 2) heritability is a population-level phenomenon, not an individual phenomenon (this is very important: let's say we can establish that trait Z has 50% heritability – that does NOT mean that your individual possession of trait Z is 50% due to genetic reasons! It means that 50% of the variance in the occurence of trait Z in the population is attributable to genes.)

Following the general Lewontin skeptical line, which is later developed in "Developmental Systems Theory," S&G claim that high heritability doesn't entail genetic determinism. Traits just need to be reliably repeated, but this repetition can be due to repetition of an environment reliably producing the trait even when there is no genetic coding for the trait. Suppose we have a trait with high heritability, let's say 90%: on S&G's interpretation, this just means that there's a 90% correlation between parents and children with the same trait: in a given population, 9 out of

10 children of parents with trait X will have trait X and only 1 out of 10 children whose parents don't have X will themselves have X.

But that doesn't mean there's a gene for X. It could be there is no such gene, that is, that the genetic profile of the parents with X is not appreciably different from the genetic profile of parents without trait X. It's just that parents with trait X are correlated with an environment that reliably produces trait X (that is, in the example, with 90% reliability), and parents without trait X are correlated with an environment that produces trait X only 10% of the time. To give the crudest possible example, let's pretend the trait "speak English" has 90% heritability (9 out of 10 children whose parents speak English will speak English too). Fine, but of course there's no gene for "speak English." What produces the heritability is that 90% of the children of English-speaking parents inherit an English linguistic environment (but, *ex hypothesi*, 10% are orphans raised in non-English-speaking environments). Now if you substitute "score above average on the ACT test" for "speak English" you can see some of the social implications here.

2.3: The Received View and Its Challenges

THE UNITS OF SELECTION: 1) sketch of gene selectionism here as challenge to received view focus on organisms, populations, and species. Definitions of replicators, vehicles or interactors, and lineages. 2) hierarchical view: organisms, groups, species are all targets of selection, which can act simultaneously on different levels.

SELECTION AND EVOLUTION: Gould and Lewontin criticism of (extreme) "adaptationism." G and L claim that adaptationists assume most traits have functions that were selected for (rather than being exaptations or just plain accidents of history). Punctuated equilibrium doesn't seem to fit with constant, slow and steady selection. "Just-so stories" are always a threat: "reverse engineering" from what we have now to what "must have been" the pressures that produced it. Sociobiology and EP are also involved in the adaptationist controversy.

EVOLUTION WITHIN BIOLOGY: lock-and-key adaptation / selection vs niche-construction. Evo-devo and current research into evolution and development interaction: what is developmentally possible constrains generation of variation (extreme quick changes won't survive), but capacities for development (robustness and plasticity both) have evolved, like everything else. We also have to remember the process structuralists, who think physical constraints on morphogenesis severely constrain the role that variation and hence natural selection can play in evolution.