

# 21A.303J / STS.060J

## Anthropology of Biology

### Spring 2022

Professor Stefan Helmreich

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#### **Course Description**

If the twentieth century was the century of physics, the twenty-first has become the century of biology. This subject examines the cultural, political, and economic dimensions of biology in the age of genomics, biotechnological enterprise, biodiversity conservation, pharmaceutical bioprospecting, synthetic biology, global pandemic, and more. Although we examine such social concerns as genetic modification and reproductive rights, this is not a class in bioethics, but rather an anthropological inquiry into how the substances and explanations of biology — increasingly cellular, molecular, genetic, viral, and informatic — are changing, and with them broader ideas about the relationship between “nature” and “culture.” Looking at such scientific forms as cell lines, CRISPR, and epidemiological models, and drawing upon primary sources in biology, social studies of the life sciences, and literary and cinematic materials, we rephrase Erwin Schrödinger’s famous 1944 question, “What Is Life?” to ask, in the 2000s, “What Is Life Becoming?”

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## In the Beginning Was the Word?

The Genetic Code and the Book of Life

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LILY E. KAY

And this is the thesis of my study, *Who Wrote the Book of Life? A History of the Genetic Code*: that molecular biologists used “information” as a metaphor (for biological specificity); in fact, it is a metaphor of a metaphor, thus a signifier without a referent and, as such, it became a rich repository for the scientific imaginaries of the genetic code as an information system and a book of life. The information discourse and the scriptural representations of life were inextricably linked. Metaphors, as we will see, are ubiquitous in science, but not all metaphors are created equal. Some, like the information and code metaphors, are exceptionally potent due to the richness of their symbolisms, their synchronic and diachronic linkages, and their scientific and cultural valences. Though remarkably compelling and productive as analogies, “information,” “language,” “code,” “message,” and “text” have been taken as ontologies. And the consequences are far-reaching, for the limits of these analogies also challenge the mastery of the genomic Book of Life, the technological and commercial goals of its “reading” and “editing.”<sup>9</sup>

Kay, Lily E. “In the Beginning Was the Word?: The Genetic Code and the Book of Life.” Chapter 15 in *The Science Studies Reader*. Edited by Mario Biagioli. Routledge, 1999. © Routledge. All rights reserved. This content is excluded from our Creative Commons license. For more information, see <https://ocw.mit.edu/help/faq-fair-use/>.

# REFIGURING LIFE

*Metaphors of Twentieth-Century Biology*

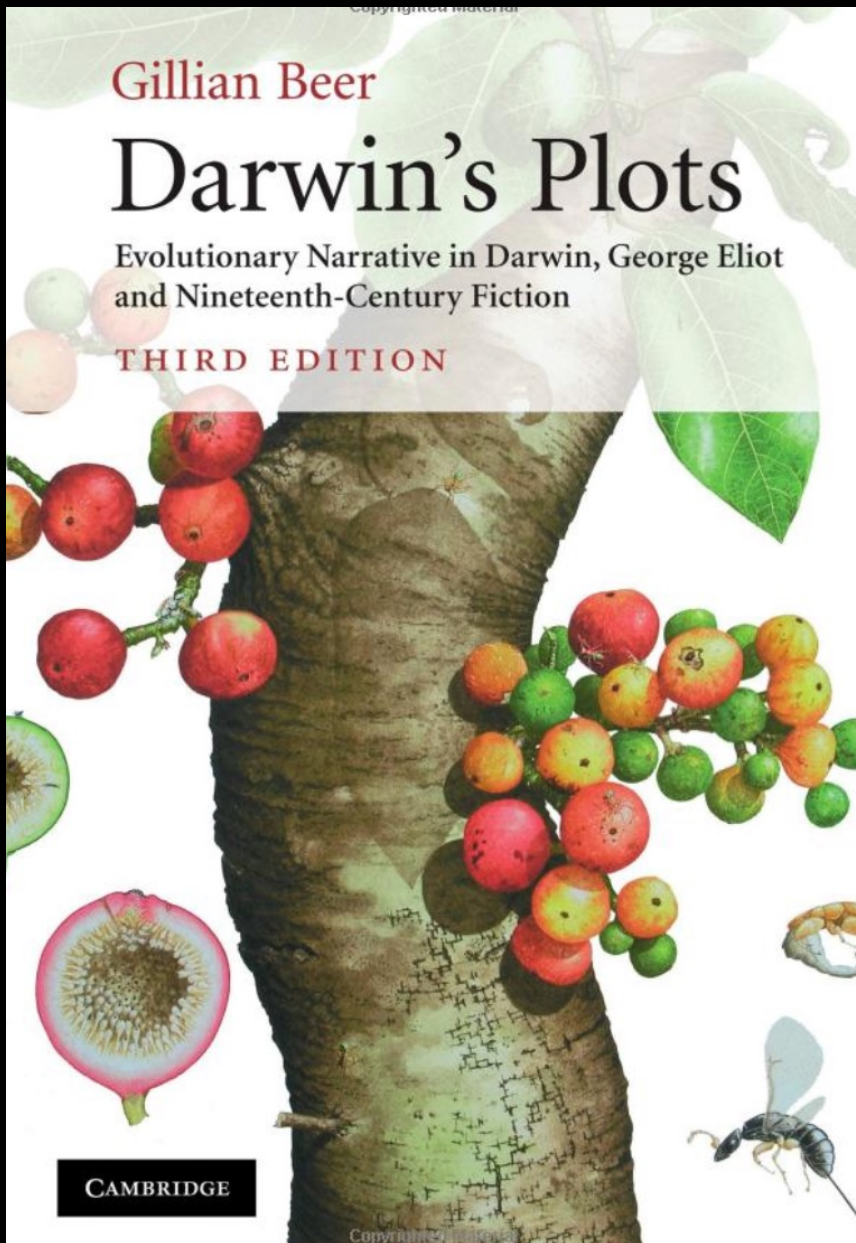
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EVELYN FOX KELLER

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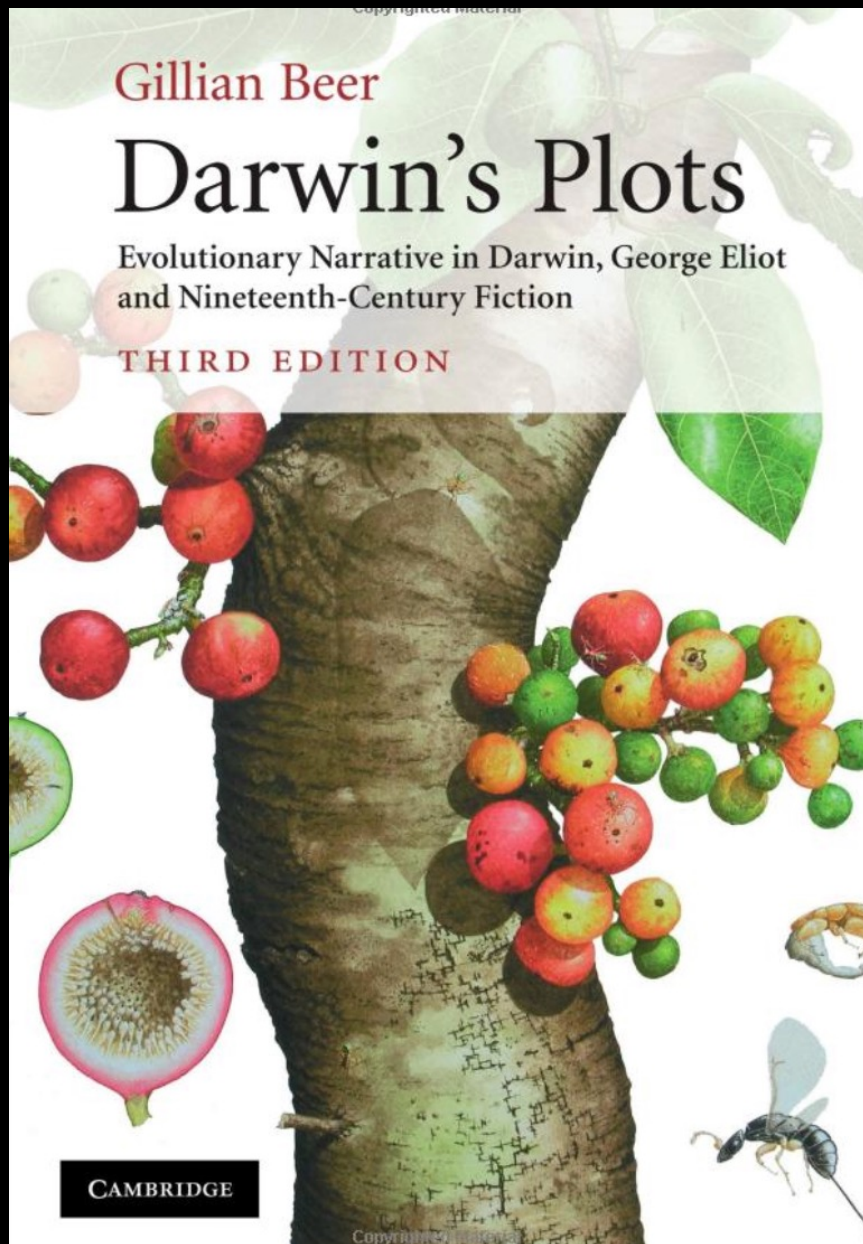
My first lecture was devoted to the biological discourse of gene action. Schroedinger added to this discourse several metaphors, already familiar from nineteenth-century discussions of Maxwell’s Demon: he figured the uncanny order of the body as a product of an intelligence system—such as the army or the state—indeed, a system also quite akin to the systems of “command, control, and communication” that Norbert Wiener and his colleagues were just at that time beginning to develop. Schroedinger invoked neither railway pointsmen, nor intelligent doorkeepers, nor miniature “observant and neat-fingered beings”; yet the devices he

Keller, Evelyn Fox. “Molecules, Messages, and Memory: Life and the Second Law.” Chapter 2 in *Refiguring Life: Metaphors of Twentieth-Century Biology*. Columbia University Press, 1996. © Columbia University Press. All rights reserved. This content is excluded from our Creative Commons license. For more information, see <https://ocw.mit.edu/help/faq-fair-use/>.



"Darwin's struggle to find a language to think in. ... The key concepts for natural theologians seeking to display God's working in the material world were design and creation. Darwin, on the contrary, was trying to precipitate a theory based on production and mutation" (xviii). As Beer puts it, "He was telling a new story, against the grain of the language available to tell it in" (3) "the title ... *Darwin's Plots*, indicates both the plots that Darwin grew up with and the plots he generated for others" (xxiv).

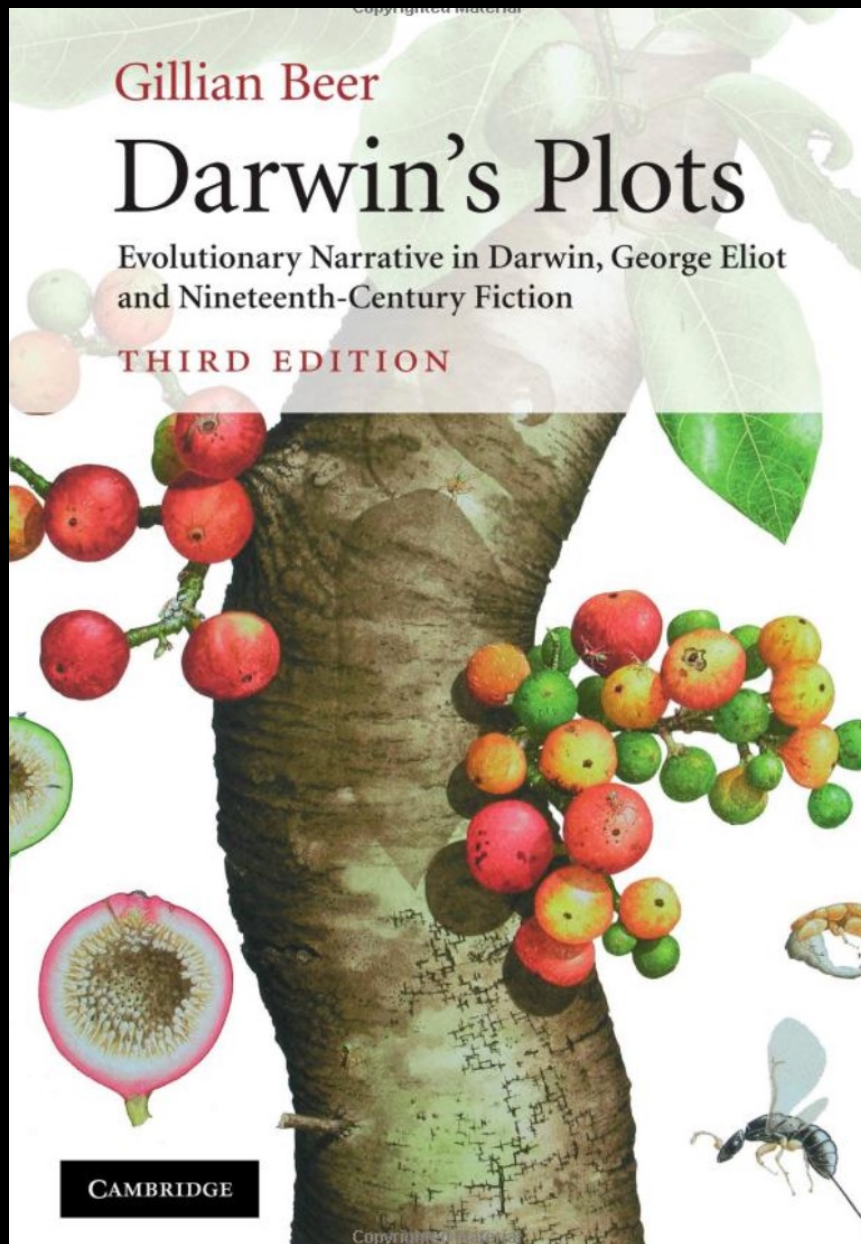
Beer, Gillian. *Darwin's Plots: Evolutionary Narrative in Darwin, George Eliot and Nineteenth-Century Fiction*. 3rd ed. Cambridge University Press, 2009. © Cambridge University Press. All rights reserved. This content is excluded from our Creative Commons license. For more information, see <https://ocw.mit.edu/help/faq-fair-use/>.



## "The Remnant of the Mythical"

"Darwinian theory takes up elements from older orders and particularly from recurrent mythic themes such as transformation and metamorphosis. It retains the idea of *natura naturans*, or the Great Mother, in its figuring of Nature. It rearranges the elements of creation myths, for example substituting the ocean for the garden but retaining the idea of the 'single progenitor' – though now an uncouth progenitor hard to acknowledge as kin. It foregrounds the concept of kin – and aroused many of the same dreads as fairy-tale in its insistence on the obligations of kinship, and the interdependence between beauty and beast"(7).

Beer, Gillian. *Darwin's Plots: Evolutionary Narrative in Darwin, George Eliot and Nineteenth-Century Fiction*. 3rd ed. Cambridge University Press, 2009. © Cambridge University Press. All rights reserved. This content is excluded from our Creative Commons license. For more information, see <https://ocw.mit.edu/help/faq-fair-use/>.

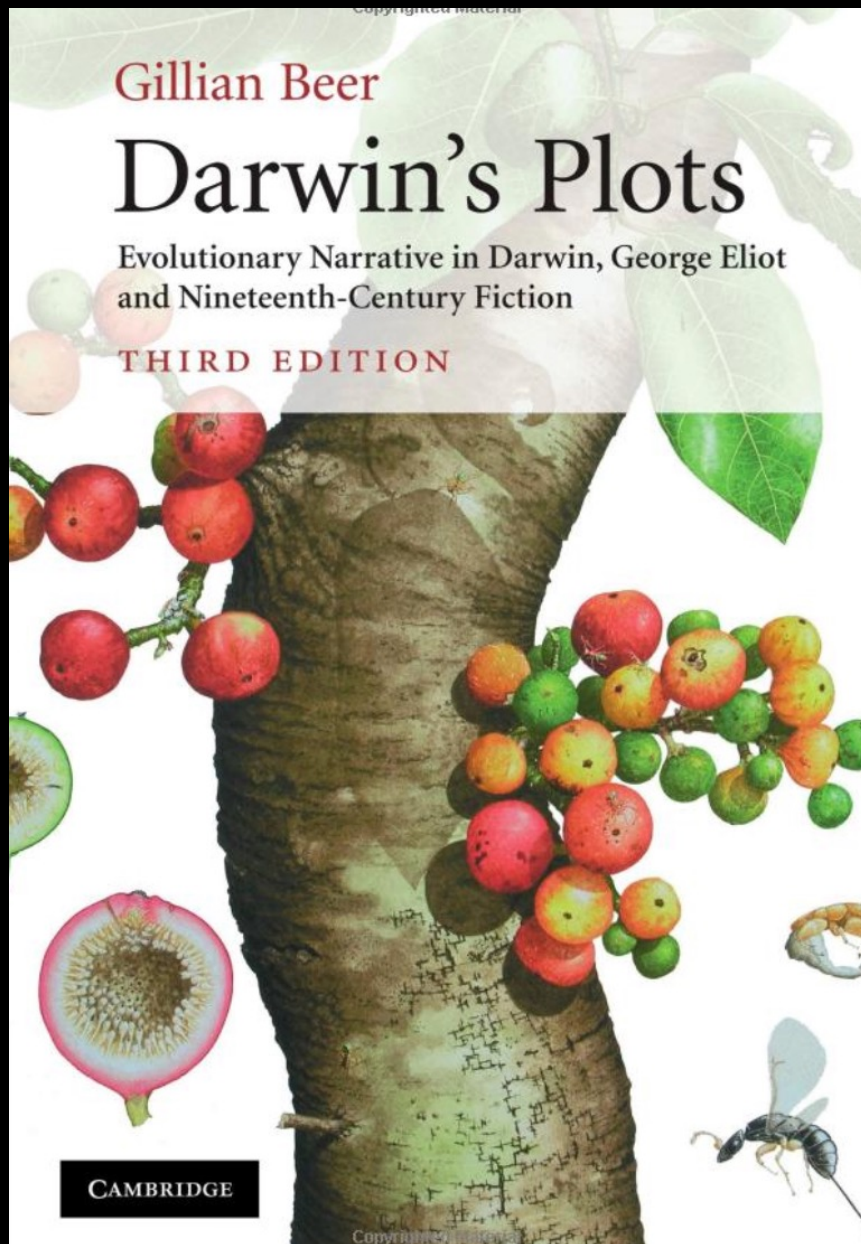


“One of the persistent impulses in interpreting evolutionary theory has been to domesticate it, to colonise it with human meaning, to bring man back to the centre of its intent” (7).

“It is a theory which does not privilege the present, which sees it as a moving instant in an endless process of change. Yet it has persistently been recast to make it seem that all the past has been yearning towards the present moment and is satisfied now” (10).

“Evolutionary theory emphasised extinction and annihilation equally with transformation – and this was one of its most disturbing elements” (12).

“It is extraordinarily difficult to eradicate the language of intention from accounts of evolutionary development. ... An intentionalist language keeps creeping into accounts of evolution” (19).



“the concepts of evolutionary theory have shifted the weight of words in common use: words like development, generation, variety, inheritance, individuals, kinship, transformation” (13)

*Naturalization*: taking social and cultural values (around e.g., sex, inequality) and claiming that they are “natural” — inevitable, given, perhaps harmoniously designed (by a divine being) or rationally explicable (with recourse, for example, to evolutionary narratives). Naturalization — reading cultural ideas into nature and then back out again — has often served as a resource for legitimating social orders.

# U.S. Has Far Higher Covid Death Rate Than Other Wealthy Countries

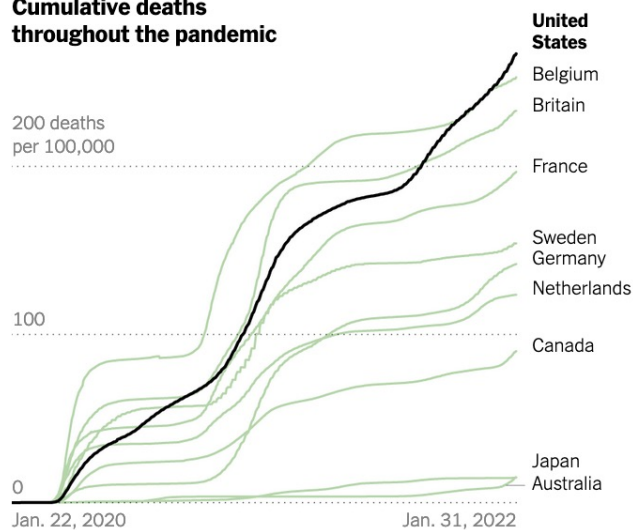
By Benjamin Mueller and Eleanor Lutz Feb. 1, 2022

Two years into the pandemic, the coronavirus is killing Americans at far higher rates than people in other wealthy nations, a sobering distinction to bear as the country charts a course through the next stages of the pandemic.

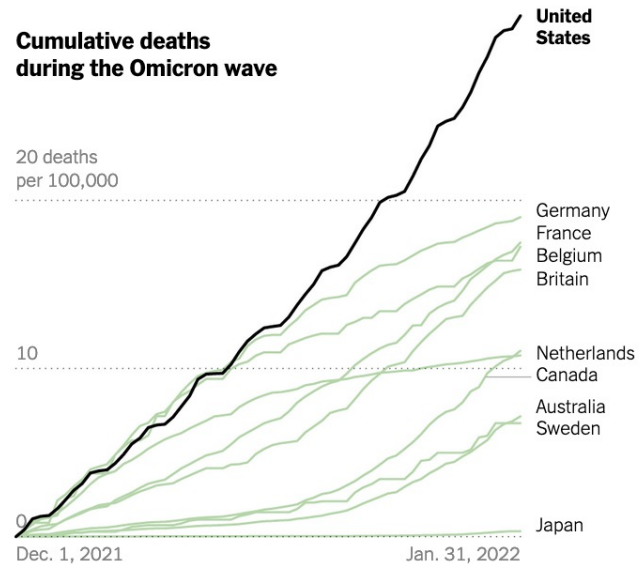
## Cumulative U.S. Covid-19 deaths per capita are highest among other large, high-income countries

Several countries had higher per capita Covid-19 deaths earlier in the pandemic, but the U.S. death toll now exceeds that of peer nations.

Cumulative deaths throughout the pandemic



Cumulative deaths during the Omicron wave



ON  
THE ORIGIN OF SPECIES

BY MEANS OF NATURAL SELECTION,

OR THE

PRESERVATION OF FAVOURED RACES IN THE STRUGGLE  
FOR LIFE.

By CHARLES DARWIN, M.A.,

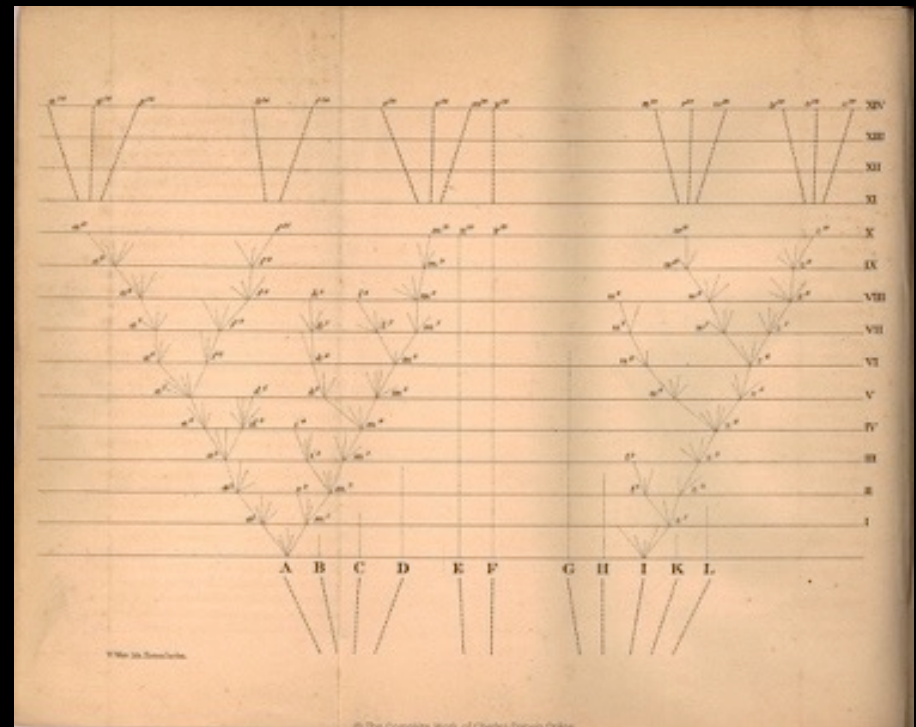
FELLOW OF THE ROYAL, GEOLOGICAL, LINNÆAN, ETC., SOCIETIES;  
AUTHOR OF 'JOURNAL OF RESEARCHES DURING H. M. S. BEAGLE'S VOYAGE  
ROUND THE WORLD.'

LONDON:  
JOHN MURRAY, ALBEMARLE STREET.  
1859.

*The right of Translation is reserved.*

Thus, from the war of nature, from famine and death, the most exalted object which we are capable of conceiving, namely, the production of the higher animals, directly follows. There is grandeur in this view of life, with its several powers, having been originally breathed into a few forms or into one; and that, whilst this planet has gone cycling on according to the fixed law of gravity, from so simple a beginning endless forms most beautiful and most wonderful have been, and are being, evolved.

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THE  
DESCENT OF MAN,

AND

SELECTION IN RELATION TO SEX.

BY CHARLES DARWIN, M.A., F.R.S., &c.

IN TWO VOLUMES,—Vol. I.

WITH ILLUSTRATIONS.

LONDON:  
JOHN MURRAY, ALBEMARLE STREET.

1871.

[The right of Translation is reserved.]

Ann. Rev. Anthropol. 1986. 15:25-66  
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THE CHANGING ROLE OF WOMEN  
IN MODELS OF HUMAN  
EVOLUTION

Linda Marie Fedigan

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Canada

That is why the practice of modeling the life of early humans, although shunned by many anthropologists, is nevertheless a scientific game played with great determination; its reward is the right to propound a view of human nature. Some of these models are widely disseminated, in high school and college textbooks, in popularized scientific writings, in fiction, on film. And in a society which tends to believe that what is natural is good, or at least acceptable, "scientific" statements about the original nature of human society represent applications of data which even those who disapprove of such modeling can ill afford to ignore.

Fedigan, Linda Marie. "The Changing Role of Women in Models of Human Evolution," *Annual Review of Anthropology* 15 (1986): 25-66. © Annual Reviews. All rights reserved. This content is excluded from our Creative Commons license. For more information, see <https://ocw.mit.edu/help/faq-fair-use/>.

In the absence of an understanding of how traits are biologically transmitted to the next generation, Darwin used a concept he called "equal transmission of characters" to explain how women were not left totally behind in the process of human evolution. In this way, Darwin helped to pioneer what I call the "coat-tails" theory of human evolution: traits are selected for in males and women evolve by clinging to the men's coat-tails. This model became, and remains, the predominant image of human evolution, though rarely so candidly stated as by Darwin:

Thus man has ultimately become superior to woman. It is indeed fortunate that the law of equal transmission of characters to both sexes prevails with mammals. Otherwise it is probable that man would have become as superior in mental endowment to woman as the peacock is in ornamental plumage to the peahen (15, p. 874).

*Charles E. Rosenberg*

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## What Is an Epidemic? AIDS in Historical Perspective

Thus, as a social phenomenon, an epidemic has a dramaturgic form. Epidemics start at a moment in time, proceed on a stage limited in space and duration, follow a plot line of increasing and revelatory tension, move to a crisis of individual and collective character, then drift toward closure. In another of its dramaturgic aspects, an epidemic takes on the quality of pageant—mobilizing communities to act out proprietary rituals that incorporate and reaffirm fundamental social values and modes of understanding. It is their public character and dramatic intensity—along with unity of place and time—that make epidemics as well suited to the concerns of moralists as to the research of scholars seeking an understanding of the relationship among ideology, social structure, and the construction of particular selves.

### *Act I. Progressive Revelation*

### *Act II. Managing Randomness*

### *Act III. Negotiating Public Response*

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# Spectacles of Difference: The Racial Scripting of Epidemic Disparities

KEITH WAILOO

ignored COVID-19's reality much longer. Rather than revising Rosenberg's analysis, the following pages develop the dynamics of race and racism as a major subplot of many epidemics. But the vast literature on race and epidemics that has appeared since 1989 goes further than merely adding a new dimension to epidemic dramaturgy. Rather, it suggests that epidemics past and present give rise to distinctive, recurring scripts about bodies and identities, with sweeping racial effects. Where Rosenberg saw an Act II focused on "managing randomness," this scholarship suggests that it is often "race," rather than merely "randomness," that frequently becomes a focal point for crisis management amid the turmoil and calamity.

## Act I. Racial Revelation

## Act II. Staging Bodies and Places

## Act III. Making the Racial Spectacle

## Act IV. Fixing Racial Boundaries

Wailoo, Keith. "[Spectacles of Difference: The Racial Scripting of Epidemic Disparities](#)." *Bulletin of the History of Medicine* 94, no. 4 (2020): 602–25. © Johns Hopkins University Press. All rights reserved. This content is excluded from our Creative Commons license. For more information, see <https://ocw.mit.edu/help/faq-fair-use/>.

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