Thurtle, Phillip. _The Emergence of Genetic Rationality_ (2008)
Part IV "The Poetics of Wandering"

The philosophy of Nature needs a language that can take up Nature in its least human aspect, and which thereby would be close to poetry.

—Maurice Merleau-Ponty
DAVID STARR JORDAN SUPPOSED THAT GIVEN THE
right resources, the correct training, and the proper selective environment, individuals with reserve force would rise to lead the nation. Jordan even gives a brief mention at the end of the first volume of his autobiography of some of the accomplished Stanford graduates between 1892 and 1899. The most highly accomplished students earned a mention in the body of the book as well. Foremost of these was the “best known of all graduates,” Herbert C. Hoover. Jordan’s self-perceived success at graduating men of accomplishment reminds us of the larger paradox at the heart of selectionist thinking: how does one select for that which goes beyond one’s vision? In other words, how does one select for qualities and capacities that will arise in the future? This question speaks directly to what has been called the problem of innovation. One is not really innovating if one already knows what one wants to build. According to the mathematician John Holland, innovation is not a straightforward application of deduction but a process that “seems to involve a controlled invocation of emergence.”

As we saw in Part One, Jordan’s answer was to use intra-institutional competition, or corporate inheritance, as a basis for selection. If sufficiently complex, an institution could select for traits that may not have been consciously
characterized but whose expression would help the institution as a whole. This implied, however, a more complex relationship between the environment and the individual than that for which the recapitulationist model accounted. Intra-institutional agency suggested that the environment helped define the relationship between the agent and his actions. At the very least, it implied that the institution provided the conditions that brought the competing individuals together in the first place.

Institutions were just one mechanism that late nineteenth-century thinkers appealed to as they addressed the problem of innovation. The figure of the “wanderer” often did this work as well. Directed action already knows what it wants to acquire; wandering, however, is a form of pragmatic exploration that has no ultimate direction. Wandering provided a period in an agent’s life in which he or she identified and pursued unforeseen opportunities. The agent could then develop these opportunities in new ways.

With its emphasis on mobility, wandering also stressed the affective and perceptual modes of being in the world. Wanderers blended perception, affect, and activity in a situated dialogue with an environment more about half-articulated tendencies and dispositions than ultimate ends. For this reason, wandering often occurred for literary subjects after an aporia or impasse. A subject would come to the limits of his or her capabilities in a specific environment and then wandered to acquire new goods or information. This established the possibility for a different relationship with the environment. Like many other tropes in the panoramic mode, wandering permeated many types of discourses. Consequently, panoramic mode thinkers used the trope of wandering to understand novelty in many different situations. Wandering subjects in literature encountered new situations; wandering subjects in political economy acquired new goods and resources; and wandering subjects in evolutionary theory acquired new traits. In the terms of information processing developed in these pages, wandering allowed subjects to process information about themselves and the world.

Let me explain. The world presents itself in distinct ways when one is wandering. First, one is more aware of one’s environment if one is not rushing to get to someplace else. Second, wandering inhibits the accumulation of possessions. It is difficult to wander carrying a large number of goods. The philosopher Vilém Flusser recognizes these points in his collected essays on modern migrants. “It is true that the settled possesses and the wanderer experiences,” writes Flusser. Because of this, settled people “rush between the private and the political, the
wandering of nomads is open-ended."4 Wanderers tend to highlight forms of information predicated upon communication and experience; settlers tend to highlight forms of information based on the possession of goods. This then highlights the importance of concentrating on the infrastructure settled folk use to accumulate and distribute information. When one is settled, one needs to rely on the social infrastructures to encounter new experiences. In a sense, settled folk need for their information to wander, even if they do not. If individuals primarily receive information in the form of goods, then the development of that third space in natural history, the space I have been calling “the space of flows,” becomes important as a tool for processing information as well as distributing resources.

As we saw with Spencer Baird, specimen collecting, and our investigation of fish markets, natural history relies on both modes of information processing: information gathered by the experience of wandering and information accumulated as goods in a private collection or a natural history museum. Large collections were possible in the first place precisely because they were able to be stored in a repository, whereas wandering allowed collectors to gather new specimens. The history of natural history can be analyzed by investigating how researchers have exploited the relationships among these three ways of processing information: the collecting of specimens, the circulation of specimens in information, and the arrangement and analysis of specimens.

Wandering was a unique way of inhabiting the world that upheld a specific mode of interacting with the world and a specific type of agency. First of all, wandering required a moving subject. This reinforced, to a small degree, the more pervasive conception of the dynamic individual in the panoramic mode. It also privileged a conception of time as a function of movement or change. For the wandering subject, time was always perceived as a function of changes in space. The important implication of this is that one could affect time-based processes (like evolution or memory) through changes in location.

Sudden disjunctions in the experience of space, such as those provided by industrial transportation and communication technologies, promoted new foldings of space and time. One consequence of this folding was a heightened perception of the passage of time distinct from change in location. In many instances, time replaced movement as the irreducible variable of experience. Perhaps the most remarked upon example of this is how the extension of the railroads made a single standardized time desirable. The coordination of a spa-
ially vast transportation network meant the coordination of one aspect of the
social experience of time. The rise of new recording technologies also challenged
the privileged position of movement for ordering the perception of time and space.
Time could now be manipulated by altering the relationship of the recording to
the playback of information. In the case of the phonograph, for instance, this
would transfer the ordering principle of the embodied experience of time and
space from the movement of the listening or performing subject to the move-
ment of the recording or playback device. For the listener, time would then be
conceived of as a variable independent of his or her change in space. This did
not mean that human experience existed outside of space; rather, it meant that
space was no longer the predominant means for ordering relationships in time.
The material basis of the medium contributed new possibilities for the way that
time and space were folded. Although a more detailed explanation for how
scholars of heredity exploited this new relationship forms the subject matter
for the concluding section of the book, the section that follows demonstrates
how wandering as a biologic, political economic, and affective/phenomenological
dimension helped to destabilize the conception of the dynamic individual.

An important tool for explaining novelty while maintaining the delicate bal-
ance among action, affect, and sensation was poetry. Again, David Starr Jordan
provides an interesting case for how this worked. Although Jordan placed a pre-
mium on an industrious life, he frequently found time to indulge in his own
reverie. Jordan was, in fact, a poet of some note. One presumes that for an edu-
cated man at the time poetry was an acceptable medium to describe the more
sensual and emotional elements of experience. For a panoramic-mode thinker,
plot may have moved the world, but poetry best described the world’s constant
state of flux. For instance, Jordan especially liked to write poems about places
he visited. These loco-descriptive poems supplemented the daily accounting of
his activities by evoking specific scenes. Take the following poem he wrote while
in Mazarlan:

Perchance, dear heart, it may be thou and I,
In some far azure of infinity,
Shall find together an enchanted shore
Where Life and Death and Time shall be no more,
Leaving Love only and Eternity.
For Love shall last, though all else pass away.
Till each occasion Time from Life has wrung
Like outworn garments from the Soul be flung,
And it shall stand, with back no longer bent,
Slave to the lash of its environment!
Then this great earth we know shall shrink at last
To some bare Isla Blanca of the past—
A rock unnoted in the boundless sea
Whose solemn pulse-beats mark Eternity."

This seemingly radical surrendering to the environment, where action was subordinated to sensation and feeling, where the rhythm of the verse evoked the hulling of the waves, and where the repetition and the immensity of the sea invite the reader to contemplate a cosmic time in which human activity meant little, remained useful for Jordan as long as it was safely embedded in the narrative accounts of an active life. As we will see in this section, this model of writing reflected Jordan’s ideas on agency, evolution, and the importance of wandering. Much like wandering, sensation was important for guiding active organisms. Sensation for itself, however, led to the dangers of idleness and sensualism.

It is significant that Jordan used poetry when engaging in reverie. Poetry has always been credited with describing sensation and evoking affect. For Jordan, the poem was a place to dream, see, and feel. As such, it was useful for exploring hopes and fears of what may happen. As Aristotle recognized in his Poetics: “It is, moreover, evident from what has been said, that it is not the function of the poet to relate what has happened, but what may happen—what is possible according to the law of probability or necessity.” Poetry gave Jordan a way to explore or mentally wander in order to identify new descriptive and affective capacities. Gaston Bachelard (in deference to Henri Bergson’s Mind and Matter) called this function of poetry the “poetic image” as opposed to the mechanics of writing a poem. “Because of its novelty and its action,” Bachelard observed in The Poetics of Space, “the poetic image has an entity and a dynamism of its own; it is referable to its direct ontology.” Bachelard’s turn to ontology in this passage is not just a static portrayal of “being” but a dynamic appeal to the role of imagining in becoming. “To the function of reality, wise in experience of the past, as it is defined by traditional psychology, should be added a function of unreality, which is equally as positive... If we cannot imagine we cannot foresee.” In Bachelard’s conception of poetics, imagination and representation exist in a rhythm-
nic relationship that breathes life and significance into a poem: "We are offered a veritable cure of rhythm-analysis through the poem, which interweaves real and unreal, and gives dynamism to language by means of the dual activity of signification and poetry."

Although Bachelard's use of "poetics" has been criticized for its consciousness-centered approach, my eventual broadening of it into a "material poiesis of information" helps me identify how novelty manifested itself as a function of the different ways in which information was processed at different times. Consequently, my adoption of this term is intended to shift the focus of discussion from what constitutes the subject and object of experience to how novelty occurs in complex systems. This shift allows for a "productivist" approach, similar to that recently outlined by Brian Massumi, that can envision how new tendencies come into being as a function of the "wandering" of information as well as the informational subject.

Interestingly, this broadening of Bachelard's use of the term "poetics" bears similarity to how some complexity theorists have used the term "dynamic model" for understanding patterns of emergent properties. According to John Holland, a dynamic model is useful not because of its representational capacity (as would be the case in a static model) but because of its ability to iterate a few simple rules in order to understand the dynamics of how complex environments emerge and develop. Philosophers and literary critics can also be seen as working out iterations in narratives of a few dynamic properties. Interestingly, this is also the type of process that Jordan had envisioned developing at Stanford University. In his case, the iterations came through the large numbers of students processed as they wandered to new careers. In the terms I used in the introduction to the present study, this type of iteration allowed for an unfolding of possible futures. In other words, it concentrates on "what may be" and not on "what is now."

Although it lacks precedent, casting the history of heredity in this light not only fits much of the literature of the late-nineteenth century (and makes new sense of some of it); it offers a way to think about evolutionary debates as "unfoldings" in the modes of experiencing space and time. This perspective also complements the study of the intellectual inheritance from either the perspective of "natural selection" or the "inheritance of acquired characteristics." Although these debates certainly exist (and have been covered in detail by others), I find them less prevalent in my sources than other less characteristic ways of thinking about
speciation, such as biogeography, analogies with language, and models of development. Understanding the emergence of a genetic rationality involves much more than understanding the influence of specific scientific traditions. It also involves an exploration of what it was possible to think at a specific time. In the panoramic mode, the boundaries of the possible were often limited by the informational capacity of the poetics of wandering.
9 / Wandering and Narrative

In Part Three, I concentrated on the ways that recapitulation stories structured evolutionary discourse and supported the panoramic mode's experience of space and time. In Part Four, I return to many of these stories to explore the insights that turn-of-the-century recapitulation stories offer into the panoramic mode's recognition of variance within narrative frameworks. In order to do this, I will use the trope of "wandering" to reevaluate many of the themes I have covered thus far. Part Five, on hybridization, shows how these transformed themes produced the tools and the conceptual landscape that allowed for the emergence of genetic rationality.

Writing stories orders actions over time. Narrative plots are much more than a sequence of events; they also produce a logic for how we order the events and why one order has greater explanatory power than others. Peter Brooks makes this point in his Reading for the Plot. A study of plot dynamics needs to remain foremost, according to Brooks, not the study of the fixed terrain of an ordered sequence. For Brooks, plot "is not a matter of typology or of fixed structures, but rather a structuring operation peculiar to those messages that are developed through temporal succession, the instrumental logic of a specific mode of understanding." In other words, Brooks is urging us to look not just at the order of
the elements but at the rules or practices that link these orders into a convincing story. It is through an analysis of these “structuring operations” that we find a means for understanding culturally predominant ways of ordering time.

At the end of the nineteenth century, narrative formats were mostly ordered through a well-defined chronological sequence within the framework of a strong authorial voice. As the ability to experience more and more information about the world increased, longer concatenations of local experiences led to prolonged and heavily detailed descriptive sequences, a phenomenon that I have been calling the panoramic mode. Not all details fit well into the sequence, however. The more details these sequences need to order, the more variations from the sequence begin to arise. In much of the naturalism literature, these panoramic moments are treated as extended descriptive passages that act in counterpoint to plotted action. In some works, these passages take the form of a period of wandering: a narrative aporia, where characters lose trust in a current path and wander until they find a new one. Because of this, wandering introduced novel plot elements and worked against the teleological tendencies of narrative production by introducing a device for thinking about time beyond simple predestination.

A scholar of Victorian fiction, Suzanne Keen, notices a similar phenomenon in late Victorian fiction. She calls this form of narrative structure the Victorian novels’ annexes:

In small spaces and a few pages, narrative annexes challenge both cultural and literary norms to form imaginative worlds more variously, in sometimes distracting or dissonant interludes. Yet annexes never stop the plot, but serve the story by modifying the story-world. As an alternative to the techniques of fantasy or multiplied plot lines, Victorian annexes simultaneously anticipate the fragmentation associated with modern fiction.

Keen’s statement emphasizes two major qualities of narratives at this time: a strong plot line and the beginnings of “annexes” or “dissonant interludes” subsumed within the plots.

For the materials investigated below, the concept of wandering is much more appropriate than the concept of the annex because of its spatial connotations and its emphasis on interpreting all experience as organized through the durations of the body. Wandering lose a focus; they have force but cannot channel
it into function nor maintain a continuity of spatial and temporal experience
even though they have temporarily lost the means to integrate this experience
into socially (or literally) productive experience. In the most radical incarnations
of the period, wandering became an end unto itself allowing sensation and
feeling to dominate over finding a new function.

Wandering also had strong economic implications, especially in a vast,
resource-rich environment. Wanderers opened up new spaces and territories for
colonization and the development of capital. The real challenge for thinkers was
to define a form of wandering that brought in new experiences, which could eventually further the telos of the narrative of Western civil development by allowing the wanderer to integrate his journeys into a field of common experience. In political economic terms this definition required the wanderer to settle down and purchase goods (thus productively situating himself in the system of labor and capital exchange). In eugenic terms this definition meant distinguishing the wanderers who recapitulated a period of the human past, thus passing through a necessary transitional phase, from wanderers who could do nothing but wander, thus acting out pathological and eugenically deleterious behavior.

Wandering and Development
The dynamics of wandering fit well into heroic conceptions of evolutionary
agency. Wandering characters allowed narratives to process topographical space
and introduce new material for development while upholding the primacy of the
active subject. Not all wandering was equal, however, and some thinkers
even offered a categorization of the types of wandering and an evaluation of
wandering's worth for civil development. This was true for biologists and fiction
writers alike.

Jack London frequently appealed to the wandering figure as a narrative
device. London was nomadic for much of his youth and his more biographical
novels reflect this. For instance, the second half of The Valley of the Moon chronicles Saxon and Billy's wandering around the San Francisco Bay Area. Unhappy with the way that an industrial society limits them, Saxon and Billy wander until they find better opportunities. Framed by a novel explicitly influenced by recapitulationist thought, their wandering provided London a medium to investigate and then preach about the relationship of civil development to the racial capacities of Northern Europeans in America.
Wandering is, in The Valley of the Moon, an inherited tendency; it is in Saxon’s blood. Her race had used wandering to strike out from harmful situations and acquire new land. Saxon acts true to type when she and Billy decide on setting out on their own pioneering conquest of the San Francisco Bay Area.

Again she identified Billy as one of the Vikings, and pondered for a space on the strange wanderings of the seed from which she sprang. Always had her race been land-hungry, and she took delight in believing she had bred true; for had not she, despite her life passed in a city, found this same land-hunger in her? And was she not going forth to satisfy that hunger, just as her people of old time had done, as her father and mother before her?

Wandering is natural for Saxon and Billy because it is how their presumed races acquired possessions. Although finding property is paramount in the search (thus recapitulating the race’s land hunger), Saxon and Billy use wandering to relive a racial heritage. Eventually their racial heritage will allow them to wander into new opportunities. Wandering for Billy and Saxon is a poetics of the relationship between racial inclinations and environmental opportunities.

For Jack London and David Starr Jordan’s mutual friend and plant hybridizer, Luther Burbank, wandering was a way to acquire the goods and experience necessary for evolutionary development. In a passage that wonderfully conflates locomotion with industrial differentiation, Burbank claims that periods of wandering kept individuals or organisms from becoming either an un-evolved “barnacle” or an un-individuated “cog”:

My belief is that you will find most of the men in the world who have accomplished something have done a considerable amount of roving in their time, and have gathered a large amount of the varieties of moss that are most useful to us all (experience, adjustability, adaptability, facility, acquaintance, breadth of view and vision, and the chance to learn just what it is in the work of the world that is most useful for us to do). I do not insist that all young men and women should up stakes and move, or that those who do so are bound and certain to succeed just because of that. But I do maintain that the law of change, variation, new environments, and new developments of the individual as a result is a definite law of life. . . . if your present surroundings or environment or situation seems to you to hamper and restrain and hobble you, a sharp break with
all that is old and settled and habitual to you may save you from becoming a cog or a barnacle.\footnote{9}

Since old situations constrained the type of information one acquired, one needed to wander to gain a “breath of view and vision.”

Other thinkers concurred with Burbank’s privileging of physical movement. In a passage analyzing “the conditions under which the adolescent muscles best develop,” G. Stanley Hall compares the mechanized routines of modern adolescents with the more organic forms of physical activity in the “nomadic age” of civil development. “Changes in modern motor life have been so vast and sudden as to present some of the most comprehensive and all-conditioning dangers that threaten civilized races.”\footnote{6} It is instructive to see that Hall not only romanticizes pre-industrial society; he offers it as a corrective for the ills of modern society. Nomadism, for Hall, compares favorably with modern life because nomads incorporate healthy physical exercise with the development of motor skills. Nomadism was not just a reaction to industrial development; it was a distinctive stage in the history of mankind that denoted certain attributes: “For unnumbered generations primitive man in the nomad age wandered, made perhaps annual migrations, and bore heavy burdens, while we ride relatively unencumbered.”\footnote{7}

Nomadism particularly informed Hall’s emphasis on the development of adolescence, for he viewed this stage of development as a return to the nomadic period of human history. In Hall’s highly linear conception of civil development, all societies had gone through a period of nomadic hunting and gathering. Those able to survive and surpass this period possessed the stuff to have truly successful lives. Unfortunately, it was not always possible to know whether or not a child possessed the capacity for success until after he or she had endured the trials of wandering. The less successful individuals either did not survive adolescence or remained stuck in the developmental groove of wandering.\footnote{8}

Wandering and Speciation

Some evolutionary thinkers believed that wandering led to the development of new species. According to Jordan, short periods of geographical isolation actually introduced new traits into populations as long as the isolated population eventually returned to the original population. Total isolation, however, removed organisms from the challenges of life and often led to degeneration. In making
his argument, Jordan referenced the classic study by Richard Louis Dugdale on
the "hill people" known as "the Jukes." "In isolation as under charity, weakness
may mate with weakness and perpetuate degeneration. The classical studies of
Dr. Dugdale . . . show that the conditions of the slums may be transferred to the
forests." What is most interesting in Jordan's discussion of Dugdale's study is
the role of space and the organism's ability to navigate it. Isolation removed the
organism from the beneficial effects of exchange.

Outside of the swift current of life in a sheltered nook of the mountains this
family of cutthroats and prostitutes found a place for development. The crush
of a great city is in some degree an instrument of purification. It brings evil and
weakness into close competition with wisdom and strength, and the former
come to speedy destruction. The evils of the city rise from corrosion rather than
from competition. There is nothing in the pure air of the mountains that will
purify the lineage of thieves and paupers. Doubtless the fact of isolation and
freedom from stress of competition has been a factor in the preservation of the
decaying Jukes, and the same conditions bring about the results in the declining
classes driven from the plains to the mountains in other parts of the world. 10

Again, it would be anachronistic to assume that Jordan is speaking only in terms
of biological evolutionary progress. It was the isolation of the germplasm, or the
material stuff of inheritance in a population, and the influence of environmen-
tal factors that led to the degeneration of the Jukes. Isolation was dangerous
because it led to the elimination of "industrial competition" and the preserva-
tion of "lower" racial forms. 11 There was no conception of change in the strictly
modern biological sense as developed through the organism.

One omission in the many purely racial interpretations of the eugenics move-
ment is this important conception of space in the role of evolutionary practice. 12
Geographic isolation allowed for an experience of local environments in a world
that was quickly becoming linked together by transportation and communication
networks. At one time, the detailed experience of a specific place was considered
normal; now it was considered the basis for biological and cultural degeneration.
Geographic isolation was a biological phenomenon that could not be separated
from the analytical importance of the cleansing competition of an industrial soci-
ety. The cleansing competition of cosmopolitan environments led to race bene-
fitment for man and other animals. Jordan offered a clarifying analogy:
The influence of cold, darkness, monotony, and isolation is to limit the struggle for existence, and therefore to prevent its changes, preserving through the conservation of heredity the more remote ancestral conditions, even though they carry with them disadvantages and deficiencies. The conditions most favourable to fish life are among the rocks and the reeds of the tropical seas. About the coral reefs is the centre of fish competition. A coral archipelago is the Paris of fishes.13

Interesting new life forms came through the competition of cosmopolitan environments. These dense urban centers supported exchanges of all sorts and provided the proper environment for a poetics of life. Areas concentrated in life provided the number of exchanges necessary to supply the diversity that selection acts upon and the competition necessary to select for previously unselected traits.

The relationship of space to speciation is perhaps best demonstrated in Jordan’s best known article on the importance of geographic isolation in the origin of species. Published in Science magazine in 1905, the article was provocatively entitled “The Origin of the Species through Geographic Isolation.” Published as Hugo De Vries rose to popularity with his mutation theory of speciation, this article was intended as a reminder of other, more established ways of thinking about the origin of species. “Geographical isolation was a factor or condition in the formation of every species, race, or tribe on the face of the earth.” He believed this to be “accepted as almost self-evident by every competent student of species on the face of the earth.”14

These observations are important because they emphasize how crucial conceptions of space were for evolutionary thinkers. For the most part, historians have chosen to concentrate solely on the epistemological value of the claims of laboratory genetics versus natural history. Often, these historical investigations are driven by the assumption that genetics was a product of the desire to reduce life to mechanistic or chemical principles. Although this is undoubtedly true, it leaves unquestioned why reductionism, an understanding of a biologically complex phenomenon gained by reducing it into its constitutive parts, became the privileged means for understanding heredity. Jordan reminds us, however, that what was at stake for him and for others was a different conception of how the scientists conceived of space. This is most obvious in his unpublished manuscripts where he writes that “if by Evolution we mean the theoretical progress of life,
due solely to forces intrinsic in organisms, then outside influences are not concerned in it. If, however, we mean the actual development of actual organisms on this actual earth, extrinsic influences and obstacles are factors in continuous, diverging change.15

Jordan's conception of species depended on a specific relationship of the naturalist to his observations. By "actual species on this actual earth" Jordan is distinguishing observations of organisms in the field from observations of organisms as found in the laboratory (see Part Five). Embedded as he was in the panoramic spaces of late nineteenth-century natural history, Jordan considered laboratory genetics a modernism that could not fully explain the origins of species. It was not so much that it was wrong; rather, it was looking in the wrong place.

The Inheritance of Acquiring Characteristics:
The Political Economy of Wandering

As a common trope in recapitulationist stories, wandering also carried overt political economic implications. For instance, one could not wander unless one sold his property or put it in storage.16 Interestingly, much as we saw in Part Two, it is in the literature on the political economy of ownership and exchange that we see the implications of exactly how wandering mediated political economic and biological thought.

Acquiring objects and assigning meaning to these objects was the subject of two of G. Stanley Hall's students' studies in developmental psychology. The first study, "The Collecting Instinct," looked at the collecting behavior of boys and girls up through adolescence. The second study, "The Psychology of Ownership," evaluated the psychological importance of owning and selling goods in the context of civil development. Both sought to demonstrate that owning property was a natural and not a political economic consequence. Both did so by utilizing a recapitulationist framework for reasoning. "Do we believe that the child recapitulates the history of the race?" asked one student. "If so, we may not be surprised to find the passion for property getting a natural one."17

The importance of ownership, argued students Linus Kline and C. J. France, was that it helped differentiate the individual from his environment: "It was when man began to get clearer ideas about his own body, to distinguish between the self and non-self, that the idea of individual ownership became possible. The
savage’s lack of knowledge of the limits of his own self are surprising.”18 Ownership of property and the identification of a concept of “self” distinct from others went hand in hand. Under this conception, the exchange of property not only appeared as a natural development; it helped cement the bonds of social obligation by weakening the conception of “self.” Because of this, the ownership of goods actually strengthened one’s notion of self even as it differentiated it. Consequently, one satisfied one’s desire for personal agency or self-importance through the acquisition of new goods; this required money, however, and for the middle class one still had to work to secure money. Kline and France describe these economic constraints in evolutionary terms:

But when man had the notion of acquiring, in order to individuate self, to increase self importance, when he began to realize what individual property could do, life took on a different aspect for him. He broke away from his laziness, threw off his lethargy. His mind was stirred into activity. His desires became more numerous and extended to various things. And, above all, the desire for individual property is his first great incentive to labor. The effect of all this on developing mind can hardly be overestimated.19

The acquisition and exchange of goods were recognized as a function of civil and biological development. These beliefs also reinforced presuppositions regarding the gendered role of competition in industrial system building. Boys, it seemed, were much more interested in trading than girls. Girls could consume, but only boys had the power to actively transform consumption into a form of labor through exchange:

Any one who sees boys knows how strong is their passion to trade. It seems necessary for their development. The trading is not so much for gain or for any specific article as it is to satisfy the desire or the passion. It but emphasizes again how much property and property getting makes up life. In the history of the race, when men began to trade it marked the beginning of a great epoch.20

I will develop the implications for this gendered reading of possession in terms of memory and affect in chapter 10; for the present discussion, I will focus on the class implications of this passage.
Caroline Burk, another student of Hall, recognized the importance of ownership for natural history. Intriguingly, she placed knowledge acquisition through the acquisition of goods lower down on the ladder of civil and personal development than analytical thought. This implied that classification was a more natural form of knowledge than an understanding of cause and effect, even if it was less developed. Recalling Thorstein Veblen's characterization of knowledge types in relation to occupation, this observation suggests just how prevalent the causal reasoning of industrial classes was becoming. In contrast, the more descriptive knowledge practices of the business classes had already been taken for granted as a natural stage in human development (see Part Two). According to Caroline Burk, "the pre-adolescent child is a spontaneous naturalist: he gathers in his quantities."  

Understanding the close association between the type of knowledge used for understanding the world and its position as a part of recapitulated civil development allows one to understand the primacy of economic categories in eugenic and racial doctrines of the day. Eugenics was a middle-class discourse. In a letter, David Starr Jordan (also the first President of the International Eugenics Association) makes clear his feelings on ownership as a more important measurement than race for the capacities of democratic participation:

There are a great many things in which the North and South misunderstand each other. I am sure that the North will not, and ought never, to agree that any race of people shall be disenfranchised because of their race. To do this would be to invite for the future many, most of evils of slavery. But when the South is ready to disenfranchise those who do not gather property, or those who do not gather knowledge, or any other test which will give the lower race an opportunity to rise as individuals, if individuals can, there can be no serious objection. The plank in the platform proposing to use pressure is not wise. But I am sure that the principle of impartial suffrage [?], and that it must be applied to Orientals who live in our country just as it must to the Negro.

Thus, for many eugenicists, the ability to acquire, and not the possession of visual racial characteristics, was the most important test of heritable potential.

What especially tied this mode of eugenic thinking to the middle class is the emphasis on acquisition as opposed to ownership. Possession, in and of itself, without some form of disruptive break (such as a period of wandering), led only
to the conservation of old civil and biological structures. For the growing middle class, one proved one's self through the act of consumption. This is one important consequence of corporate inheritance as described in Part One. One no longer inherited goods directly; rather one inherited the capacity to acquire goods. Consequently it is in the broken heredity lines that we see the emergence of a middle class hero as an example of innate racial capabilities. A demonstrated ability to acquire suggested that one had survived the purification of a period of wandering and eventually settled down again. Thus, heroes were the "orphan" (like Billy) or the "bastard" (like Beaufort's offspring), those that had demonstrated that they had the right biological stuff to further social and biological evolution. Wandering only became a problem when it was seen as an end in itself and not as an intentional break meant to readjust the cycle of working, spending, and acquiring.

Interestingly, director of Cold Spring Harbor Laboratory and founder of the Eugenics Record Office Charles Davenport's efforts to identify "the wandering instinct" as a genetic trait jar the modern reader the most. The relationship between wandering and civil and biological development, which made recapitulation such a valuable tool for many nineteenth-century thinkers, appears awkwardly cloaked by the modernism of Davenport's appeal to Mendel's atomized conception of biological inheritance. David Starr Jordan had long supported Davenport's work. Jordan not only convinced Davenport to join the Eugenics Committee of the American Breeders Association; he was instrumental in getting Davenport appointed as general secretary of the ABA.55 "It is a familiar observation that persons differ greatly in their capacity for remaining quiet and satisfied for a long period of time," began Charles Davenport in his lecture "Nomadism, or the Wandering Impulse. With Special Reference to Heredity." Davenport decided on the term nomadism, as opposed to wanderlust, vagrancy, or others, "because it has a racial connotation. From a modern point of view, all hereditary characters are racial."26

Previous work on the subject had divided nomads into three categories: nomads of economic origin (legitimate and delinquent), nomads of morbid origin (due to physical or psychic insufficiency), and nomads of ethnic origin ("Goths, Saxons, Huns, Normans; Crusaders; Gypsies, Arabs, Siouxs, etc.").27 According to Davenport, human migrations need to be evaluated in the same terms as other migratory animals and plants. In his arguments he appeals to the logic of recapitulation as well as to the logic of the new genetics:
Lest the argument for a wandering instinct based on a comparison of man with birds may seem far-fetched, four other sets of facts may be adduced: (1) that the wandering instinct is in the anthropoid apes, which show the same basal instinct as man does; (2) that many if not most primitive peoples are migratory; (3) that the tendency to run away is extraordinarily frequent among young children; and (4) that the adolescent period, when all instincts (and especially those in any way connected with sex) are brought to the surface is perhaps the commonest period of running away. 28

In order to investigate his hypothesis “that all cases of nomadism can be ascribed to one fundamental cause—that those who show the trait belong to the nomadic race” Davenport assembled into table form one hundred family histories. 29 This allowed him to rearrange his data according to categorical distinctions not easy to follow through on other forms of data presentation. Davenport then made the following conclusions:

The wandering instinct is a fundamental human instinct, which is, however, typically inhibited in intelligent adults of civilized peoples.

Nomadism is probably a sex-linked recessive mono-hybrid trait.

Sons are nomadic only when their mothers belong to nomadic stocks.

Daughters are nomadic only when the mother belongs to such stock and the father is actually nomadic.

When both parents are nomadic expectation is that all children will be.

The nomadic impulse frequently occurs in families showing various kinds of periodic behavior, such as depression, migraine, epilepsy, and hysteria. ... The periodic psychoses are frequent concomitants, but not the fundamental cause, of nomadic impulses. They merely permit the nomadic impulses to appear. 30

Davenport believed that the nomadic impulse was a fundamental aspect of human development. Wandering allowed for acquisition of new experiences in offspring and thus allowed for individuation. “Intelligent adults of civilized peoples,” however, inhibited this impulse and thus kept wandering from appearing in its “morbid” condition: wandering as an end to itself as triggered by the appearance of other periodic or compulsive behaviors. Wandering only furthered civil evolution if it was later inhibited and allowed for settled civil development.

Wandering thus disrupts and then is recontained by the teleology of reca-
pitation stories. That sequence, disruption followed by containment, marks the discourse as a solidly middle-class discourse that accentuates the importance of acquiring goods over the importance of inheriting goods. And since the wanderer will eventually have to settle again and rejoin a community, the discourse also assures that whatever is acquired will ultimately be valued by the dominant mores of society. That the disruption takes the form of wandering marks this discourse as panoramic, where an active subject orders the world based on his movement through it. As foreshadowed by the awkwardness of Charles Davenport’s strained synthesis of genetic and panoramic discourse, the emergence of genetic rationality would eventually loosen (but not quite dissolve) the tight bond between heredity and wandering that structured writing in literature, science, and political economy.
STEPHEN GREENBLATT HAS WRITTEN ON THE fascinating inverse relationship between wandering and possession: one cannot wander unless one gives up his or her possessions. In his chapter on Sir John Mandeville, Greenblatt claims that Mandeville wrote about “what it means not to take possession, about circulation or wandering as an alternate to ownership.” Although the observation that it is hard to wander carrying possessions is sound, in the period of history that I am investigating it is much more fruitful to examine exactly how wandering and possession informed each other. In turn-of-the-century, middle-class conceptions of inheritance, possession was much less important than acquisition. This often meant that an evolutionary agent needed first to lose his or her possessions before acquiring more. In Part One, I argued that middle-class inheritance was a type of bastard birth, wherein the merit of an individual could only be told in what he had acquired as opposed to what goods he had inherited. In contrast to recapitulation stories, where the conclusion of the story is supposed in advance through a strong appeal to an implied author, the conclusion of bastard stories could only be written after the main plot elements occurred. In a sense, bastard birth was a form of hereditary wandering. The genetic value of a bastard could not be planned in advance. In each case the
recapitulation of proper social form needed to be broken in order for the evolutionary agent to demonstrate his ability to acquire. As we already saw, only those who proved themselves unable to acquire remained condemned to wander. Others used their wandering to settle down in a resource-rich or competition-free environment so that they could acquire even more goods than they inherited.

Most importantly, wandering stories emphasize a very telling cultural bifurcation in the ways that social memory was constituted. Explicating this change is essential for understanding how researchers began to think genetically. With the rise in importance of corporate conceptions of heredity, a new circuit in the relationships between bodies, goods, and stories emerged. The older conception emphasized the relationship between stories and goods by showing how goods could be directly used to constitute social memory. The newer conception emphasized the relationship between stories and social infrastructures by showing how the infrastructures used to circulate commodities were used to constitute social memory. In other words, with the rise of corporate inheritance, one selected for one's ability to acquire, in what I like to refer to as the inheritance of acquiring (rather than acquired) characteristics. One no longer inherited a good that could then trigger a specific memory, one inherited capacities that could only be retrospectively constituted after the act of selection. These more complex records emphasized the informational tools used to triage goods and not the goods themselves. This opened up new ways of conceiving of human relationships dependent on the dynamics of the informational infrastructure of industrialized economies.

The older conception didn’t disappear, although the emergence of the newer conception did change older cultural associations. In order fully to understand how these two ways of configuring social memory interacted, it is first necessary to see how social mores, the political economy of goods, spatial practices, and memory were reconfigured at the end of the nineteenth century. In order to do this we need to delve a bit deeper into the sensory-motor complex of the panoramic mode agent.

The Affective/Perceptive Capacities of the Sensory-Motor Complex

Exactly how does property acquisition allow for more biologically productive behaviors? To fully explore this question, we must first investigate biological
theories on locomotion and affect and then evaluate these theories in light of recapitulationist arguments regarding the basis of civil development.

David Starr Jordan placed a premium on locomotion in the biological development of mental capabilities. More to the point, he interpreted locomotion as the difference between sensation and action, privileging the acting rather than the sensing being. "All sensation has reference to action. If a creature is not to act it can not feel. Wherever motion exists there is some sensitiveness to external conditions, and thus is of the nature of mind." The importance placed on locomotion was not limited to evolution or to David Starr Jordan. Other recapitulation thinkers depended on it as well, suggesting that it held wide cultural appeal. Quoting from E. Burke, G. S. Hall argues: "When we attempt to measure the gap between man and the lower animals in terms of the form of movement, the wonder is no less great than when we use the term of mentality. The degree of approximation to human intelligence in anthropoid animals follows very closely the degree of approximation to human movements." Despite the emphasis in the contemporary literature on the role of cranial capacity in eugenic thought, for many eugenic thinkers, animated motion displayed intelligence as much as (or more than) cranial capacity. Having a human body meant having the capacity to be mobile; complex mobile organisms, however, required sensation to guide them. The complexity of life demanded that locomotion couple with sense experience, the ability to perceive, and judgment, the ability to make distinctions about these perceptions. As William James succinctly summarized in his Psychology: Brief Course, "all consciousness is motion."

Although they were coupled together, for Jordan it remained very important that sensation remain at the disposal of movement and not the other way around:

As the conditions of life become more complex, it becomes necessary for action to become more carefully selected. It is thus evident that, with an animal as with an army, locomotion demands direction. The sensorium is built up as a director of motion. Natural selection causes the survival of those whose sensorium is adequate for the safe control of movement.

Jordan's claim that the sensory apparatus "is built up as a director of motion" seems much too radical to modern readers, suggesting only how important this conclusion was in Jordan's view of evolution. The implication of this statement
is that sense-data should lead to more productive actions in order to be evolutionarily beneficial.

Jordan also held dear the corollary of this assumption: sense-experience as an end unto itself could lead to degeneration. Jordan fought hard in his political and academic projects to keep unwholesome explorations of sensation at bay. In fact, much of the more Puritanical consequences of Progressive Era reform (such as Prohibition) can be profitably seen as an attempt to subordinate sensation and affect to production. Hysteria, narcotics, alcohol, and even too much European literature could lead to privileging sensation over action and thus to biological degeneration.

The mind passes through a round of sensations, emotions called up by literature, music, art, religion, which may not have any direct bearing on human conduct. Their aggregate influence on the idle brain is always evil. And the misery of motor paralysis, of intellectual pauperism, is felt as the disease of ennui. The remedy for evils of revery [sic], ennui, narcotism, and the like is to be found in action. The knowledge of this fact constitutes the strength of the Salvation Army movement. The victim of mental deterioration... is given something to do. He is not to wear out the little force he has left in ineffective remorse. Better let him beat a big drum and make night hideous with unmusical song than to settle down to the dry rot of revery [sic] or the wet rot of emotional regret. Something to do and the will to act furnishes the remedy for all forms of social or personal discontent.9

Sensation and feeling should guide actions toward productive goals and should not serve as ends unto themselves.

Actively and sensually inhabiting the world had its equivalence in Jordan’s use of language. As we saw in chapter 9, narrative was useful for describing the activities of individuals. Narrative tended to subsume the perception of time as a quality of activity. This promoted a way of inhabiting the world that presented a perception of time as related to a series of actions by characters. Poetry, on the other hand, was more useful for describing the world. It evoked the sensual aspects of inhabiting the world without subsuming time to a character’s movement. In Jordan’s view, description of the world was important, as long as it remained embedded in the fabric of a life lived in productive activity. The same was true for poetry. Poetry was useful for Jordan as long as it remained framed by narrative.9
Sensual language was as dangerous as it was necessary, and thinkers of the period tended to associate such bodily expression with the female. The emotive elements brought with female involvement were a distinct danger for G. S. Hall in his “Story of a Sand Pile” precisely because they threatened the emphasis on productivity that Hall had thus far admired in small boys. “Most destructive in the ‘sand-pile’ are little girls, who quite fail to appreciate it save in spots, as it were, and therefore are as possible excluded.”

When a young lady was admitted she immediately detracted from the productive capacity of the sandbox civilization: “the young lady with her aesthetic paint-brush had introduced new ideals, for paint decorates bad woodwork.”

According to Hall, an emphasis on the sensual and aesthetic qualities of sandbox play detracted from the purpose of the sandbox, to evolve. If allowed primacy, sensation could lead to degeneracy of function, the very channel that force used to create productivity. As we will see below, this observation helped some thinkers to distinguish between forms of wandering that led to new activities and forms of wandering that were perceived as an end unto themselves.

The Apora: Time without Place

Further examination reveals that the reliance on affect in the sensory-motor schema is deeper than presumed by Jordan and his contemporaries. Although underappreciated by many at the time, affect and sensory engagement played an obviously important role in the poetics of wandering for a dynamic individual beyond providing a sensorium, the combination of all sensory faculties. According to the political economy of the middle class, all wandering needed to begin with sensation and affect. If one was not a pathological wanderer, one had first to become restless or dissatisfied with where one was before going through the trouble of packing up one’s things and hitting the road. Consequently, most characters reached an impasse or aporia, a block in their previously chosen pathway, before they began wandering. William James grasped the close relationship between feeling and locomotion: “we might say that every possible feeling produces a movement, and that the movement is a movement of the entire organism, and of each and all of its parts.”

My use of the term affect is indebted to Brian Massumi, Gilles Deleuze, Félix Guattari, and Benedict Spinoza. In A Thousand Plateaus, Deleuze and Guattari are keen to indicate a state where one can experience affect or be affected with-
out limiting this state to a feeling or an emotion. According to Brian Massumi, affect “is a prepersonal intensity corresponding to the passage from one experiential state of the body to another and implying an augmentation or diminution in that body’s capacity to act.” In these terms, affect is different from emotion in that it describes how one may affect or be affected before this state settles into a specific emotion or activity. It is also different from a tabula rasa sensing of the world in that there is a tendency toward certain responses that arise from the ways that one connects with self or the world. As Massumi succinctly recaps, “Becoming is directional rather than intentional.”

Exploring this conceptual terrain more thoroughly demands that we follow the self-referential logic of recapitulationist thinking by immersing ourselves in the experience of a wandering subject at the turn of the twentieth century. The point is not to uncover the consciousness of the turn-of-the-century wandering subject, but to locate how wandering subjects processed space and time and thus allowed for new directions to present affect and be affected.

In Jack London’s *The Valley of the Moon*, after Billy is thrown in jail for beating a scab laborer, Saxon is forced to examine the contradictions between the glorified ideal of her racial past, as learned through her mother’s stories, and her actual position in society. She begins to wander until she finds a more productive social space from which literally to re-evolve from an economic, psychically, and biologically undifferentiated subject to a content and functionally productive member of society. At the depth of her aporia, her individual consciousness drops back into an oceanic experience, a loss of the differentiation of self and environment, and her level of subsistence drops to the lowest denominator for acquiring goods, scavenging. Swallowed by grief, she loses all sense of urgency and is immersed in the moment. In the passage that follows, notice how Saxon uses this glimpse of the expansiveness of nature to realign her own priorities:

There was a freedom about it, a wide spaciousness that she found herself instinctively trying to breathe, holding her arms out to embrace and make part of herself. It was a more natural world, a more rational world. She could understand it—understand the green crabs with white-bleached claws that scuttled before her and which she could see pasturing on green-weeded rocks when the tide was low. Here... nothing seemed artificial. There were no men there, no laws nor conflicts of men. The tide flowed and ebbed; the sun rose and set; regularly each afternoon the brave west wind came romping in the
Golden Gate, darkening the water, cresting tiny wavelets, making the sailboats fly. Everything ran with frictionless order. Everything was free. Firewood lay about for the taking. No man sold it by the sack. Small boys fished with poles from the rocks, with no one to drive them away for trespass catching fish...

And here was food, food that was free.¹⁵

More a bacterium than a human, Saxon at first only ate what came to hand, in a blind, unconscious, almost strictly kinetic existence, a "vague, unreal existence" where she was "scarcely able to open her heavy eyes, to move her weary limbs."¹⁶

In the terms of David Starr Jordan, Saxon's new freedom came at the price of struggle. Saxon had literally descended to the level of tropism, or automatic movement, the simplest response to an environmental stimulus and the least conscious of all forms of locomotion. Saxon, in other words, retreated to what thinkers at the time would have called a lower functional stage of development.

David Starr Jordan described this teleology:

The animal mind has therefore a series of functional stages, the one giving way to another and none of them sharply separated from the next below, the whole collectively known as reflex action. The principal elements in this series are tropism, instinct and intellect. A tropism is an inborn inherited tendency to move in a certain direction towards light, towards darkness, towards mates or towards shelter, heat, cold, food. It is definitely and functionally fixed within a given species, its modifications due mainly to natural selection, and the failure of those with imperfect tropism to maintain themselves in the gauntlet of life.

More elaborate are the instincts by which most animal functions are controlled. These involve a particular reaction to a given stimulus, and in many forms of life this reaction becomes very complex including most of the movements of the individual. The main feature of instinct is that, however complex, it offers no choice of response, but runs in a determined groove.¹⁷

Even though London does not use it, Jordan’s metaphor of the groove illuminates how a conception of the development of intellect was thought a property of locomotion. One could claim that Saxon’s life had been reduced to playing the grooves, a metaphor of mechanical recording technologies. The groove scratched in a wax or tin cylinder, for instance, contains the needle of the phonograph during playback. This allows the phonograph to reproduce the invisible
scratches in the groove as audible sound. The problem with a groove, however, is it provides no immediately satisfying way for thinking about how new memories can be scratched into the vinyl. As we saw in chapter 9, for Jordan and other panoramic mode thinkers, the groove could only be broached by a supreme and highly focused burst of energy Jordan referred to as reserve force. At the depth of her aporia Saxon lacked reserve force. She was literally no longer human, she had devolved to the level of playing back her inorganic instructions.

Although potentially a form of a permanently de-evolved state, this period could also prove a time of great value if it could be used to help redirect action later. Jordan recognized that old structures needed to be broken before building anew could begin. He wrote in his diary: “Progress in life due to chronic unrest. Civilization has arisen from the growth of wants.” For many progressive thinkers, progress came from new desires and one’s determinations to satisfy them. This was true for linguistic, civil, and organic animal evolution. “Breaking down of old strictures the beginning of advance. In Language. In Institutions. In Organisms.”

Saxon remained in this state for days, roaming the shores of the San Francisco Bay. Although this is only a small section of the novel, London uses common narrative techniques to suggest Saxon’s feeling of timelessness, lending immediacy to this passage. For instance, London interweaves descriptive passages of Saxon’s wandering with internal dialogue. Billy is gone, Saxon’s major partner in dialogue, so these passages contain much less distance from Saxon’s internal existence. The sense of self that emerges is a thickened sense of the integrity of the sensory-motor system as opposed to the fully differentiated sense of self that comes through the interaction with the other and for the other. Saxon also loses track of time as anticipation and retention. The plot of the story is suspended by the relatively unreflective recounting of Saxon’s immediate experience.

There is a strange double logic of time operating in these passages that deserves to be further explored. The first logic is that Saxon devolved since she is no longer the master of her time. Sensation has subordinated movement and a heroic agency is replaced by an affective reflexive agency where Saxon mostly becomes aware of the very richness of her own awareness. Time seems to stop. The plot is suspended in the fog of Saxon’s experience and there is little action that moves the plot along. In terms of the political economy of the panoramic subject, Saxon is a broken producer. She no longer has the ability to make new things.

On the other hand, the world still moves around Saxon. The sea itself produces food, and Saxon can feed herself without wandering. From this perspec-
tive, Saxon is a healthy consumer. This allows Saxon to remain stationary and appreciate the passage of time divorced from changes in place. This relationship to time is also similar to the sense of time enforced by the development of an extended commodities market. As the industrial production of goods extended in distance, quantity, and type, the need to search for objects and the need for the directed force necessary to produce objects became less important. Sensation and affect rather than production were highlighted. I will evaluate this development in relation to possession and memory later. Specifically, I will show how the panoramic mode gave way to a bifurcation, or culturally distinct division, in the ways that researchers used objects to relate to and manipulate temporal event horizons. At this point, I want to speak more directly to the perception of time.

One experiences time differently when one is actively moving versus when one is standing and sensing. The feelings one gets while watching waves on a shore are different from the directed sense of purpose one gets when moving toward a specific location. Watching the surf pounding on the beach opens one up to an experience of the cosmic durations of time where one can listen to a "pulse beat of eternity" and enjoy the expansiveness of reverie. One also begins to see the dynamics of "place" as a function of time. By standing in a single place for a period of time, one begins to see how places evolve and change over time. In the panoramic mode, one had to turn off the "motor" of the sensory-motor apparatus in order to explore the dimensions of time revealed through sensory experience. This observation suggests at least two different modes of experiencing time: an expansive time outside the self and a directed time of movement.

William James also noticed the importance of these two ways of experiencing time in his discussion of the "pure experience" of the "instant field of the present at all times." For James, one's perceptions of conjunctive relations between objects are just as real as the perceptions of the actual objects. When we look at a table with flowers on it, we not only perceive the table and the flowers but the relationship they have to each other. This relationship is of the same metaphysical order as the elements themselves. The implication of this for time perception is that all experiences of the moment are not isolated or static things but streams of an (over)flow where moments are perceived to relate to each other. According to James, this leads to the experience of time as a flow rather than as a series of instances: "Experience itself, taken at large, can grow by its edges. That one moment of it proliferates into the next by transitions which, whether conjunctive or disjunctive, continue the experiential tissue." Knowledge of sensi-
ble realities thus comes to life in the tissue of experience. It is *made* and made by relations that unroll themselves in time." The result of this is that time itself is productive. "Empty our minds as we may, some form of changing process remains for us to feel; and cannot be expelled. And along with its sense of the process and its rhythm goes the sense of the length of time that it lasts. Awareness of change is thus the condition on which our perception of time's flow depends." This conception of time opens up a notion of the agency of time as a property of change outside the domain of locomotion. Although this conception of time was not specific to the period (in fact it is quite old), it is significant that it is reintroduced at this historical moment as a defining principle of consciousness.

This experience of time emphasizes the individual's experience of time passing. As the phenomenologist Edmund Husserl suggests in "The World of the Living Present and the Constitution of the Surrounding World That Is Outside the 'Flesh,'" one sees one's self as part of the flux of time as well as part of the flux of the self.

On the one hand, there is the variation of appearances within the system of appearance (the variation of subjective presentations going up as far as the causalities that present themselves) and the variation "from itself" of the entire system of appearing, including what does-not-vary "by itself." And on the other hand, there are variations coming from me, from my doing, begun by my kinesthetic doing. It is however always a doing, and a doing in the system of being-able-to-do.26

Husserl's insight is that these two states are dependent on each other. One's body and its capacities are always part of the world, even in contemplation.27 Influenced by Husserl, Maurice Merleau-Ponty conceives of the flesh of the body as an irreducible element that constitutes the crossing or intertwining of world and self. Thus while we inhabit the world, the world inhabits us.28 What results is not a moving into or away from embodied experience, then, but a differential folding of the material dimensions of how these experiences are ordered in relationship to each other. At the turn of the century, these folds constituted new circuits for the keeping of memories that differentially reflect the way in which stories and goods are implicated with time and memory.

This change was important. The agent lost its heroic status because the world had acquired heroism. Time rather than movement produced change. As
William James noticed, with this realization, causation ceased to be a mystical or properly human category. "Causation inhabits no more a sublime level than anything else. It lives apparently in the dirt of the world as well as in the absolute, or in man's unconquerable mind."28 Brian Massumi has more recently written on the importance of change located outside of the subject. "Philosophically, the world is the monster. The monster is not an invasion from out of space, it's an ingress from immanence: an emergence from or surprising self-disclosure of the world's already-in-process."30 Massumi's language in this passage is especially revealing for my argument. In evolutionary terms, change was not just a product of individual organic expression (the monstrosity of flesh) but by the productive power of time as an immanent product of the world in flux (the monstrosity of the world). This form of monstrosity, once re-mapped back onto the tissue of the body, would come to be known as "mutation." The world itself is the wanderer, and sometimes, it wanders within us.

It is no accident that Saxon's aporia takes place at the edge of the sea. For London, the sea is the place of dissolution and reconfiguration. It is the origin of all life as well as a place where the monstrous nature of the world cannot be ignored (much like the Yukon in his earlier work). The ocean's vast space, the lulling of the waves, and the unseen depths all suggest a working of time beyond the human capacity to perceive it. If there is a single candidate for a secular space where the human can glimpse the workings of the cosmic then surely the ocean has to be it. According to literary scholar Gillian Beer, "Evolutionary theory implied a new myth of the past: instead of the garden at the beginning, there was the sea and swamp. Instead of man, emptiness—or the empire of mollusks."31 The sea is where the pounding of the surf dominates one's experience of time, and the search for food is close to effortless. Even Jordan's poem above pays homage to the recurring rhythms of the sea as the site of eternity penetrating everyday experience. The sea is where mollusks govern man, repetition precedes plot, and force precedes action. The fecundity of the sea operates as a mechanism that drives evolutionary processes beyond the agency of the panoramic subject. The sea suggests the power of nature, but it does so at a terrible price—the loss of heroic agency.

Having grown up near the Oakland docks, London associated this fear of the loss of individuation with a fear of losing his own climb up the social ladder. In The People of the Abyss, for instance, London relates his own journey into London's East End as an exploration into British poverty as well as a journey
down the evolutionary ladder. London begins his journey in a chapter appropriately entitled “Descent”: “And as far as I could see were the solid walls of brick, the slimy pavements, and the screaming streets; and for the first time in my life the fear of the crowd smote me. It was like the fear of the sea; and the miserable multitudes, street upon street, seemed so many waves of vast malodorous sea, lapping about me and threatening to well up and over me.” At stake for London was not just the loss of social status, but the loss of identity—not psychoanalytical identity, but the loss of organic individuation.

This is brought home at the end of London’s Martin Eden. Martin had started his life as a merchant marine and, much like London himself, ended up gaining notoriety as a writer of adventure stories. Eventually, sick at heart, his vitality marking him as unfit for polite society, his accomplishments marking him as equally unfit to return to his working class pals, Martin decides to take his own life by throwing himself from his cabin on a cruise ship. In this case, the violent pain of a fish eating him interrupts his eventual dissolution into nothingness:

A bonita stuck at his white body, and he laughed aloud. It had taken a piece out, and the sting of it reminded him of why he was there.

... He filled his lungs with air, filled them full. This supply would take him far down. He turned over and went down head first, swimming with all his strength and all his will. Deeper and deeper he went. His eyes were open, and he watched the ghostly, phosphorescent trails of the darting bonita. As he swam he hoped that they would not strike at him.

... the bubbles rubbed and bounded like tiny balloons against his cheeks and eyes as they took their upward flight. Then came pain and strangulation. ... There was a long rumble of sound, and it seemed to him that he was falling down a vast interminable stairway. And somewhere at the bottom he fell into darkness. That much he knew. He had fallen into darkness. And at the instant he knew, he ceased to know.

Martin chooses the fate of the disembodiment of nature rather than the disembodiment of an industrially defined social system. In both cases eternity cracks open personal time through the de-individuation of the biological and psychological subject. In terms of narrative theory, sensation dominates over action. In terms of evolutionary theory, degeneration comes from privileging sensation over action. According to Jordan, “Much that has been called ‘degeneration’ in mod-
em social life is due to the predominance of sensory impressions over motor movement. Despite the work of William James, understanding how time could move stories in and of itself was just too risky for many panoramic mode thinkers. Sensation, if left undirected by personal action, only led to personal dissolution. This problem became especially acute when conceived in terms of cultural memory. If change happened outside of the individual, how would an individual ever record or understand this change? Understanding how fruitful this aponia was for modernist thought requires a closer examination of the function of writing and memory in the panoramic mode.
PERSONAL OWNERSHIP, WRITING, AND MEMORY ARE tightly linked in the panoramic mode of processing information. As we saw in Part Two, goods still provided the basis for most forms of biological knowledge. Most goods, however, do not speak by themselves and cannot provide memories on their own. An interpretive agent is needed to tell the story that goes with that good. At first this interpretive agent was an embodied agent; later it became part of the packaging and distribution of the good. As the ability to exchange goods increased, the amount of information packaged with the object began to overwhelm the object itself. This was especially true with the advent of standardized practices and the other superstructural developments designed to increase the safe and efficient handling of goods.

These changes introduced new textures to experiences and memories. Walter Benjamin’s essay “Unpacking My Library: A Talk about Book Collecting” highlights the ways that ownership prefigures knowledge and that consumers use goods to constitute new relationships between themselves and their environments. Tellingly, Benjamin even suggests how closely aligned the inheritance of property is with the social attitudes that Edith Wharton referred to as “good breeding”: “Actually inheritance is the soundest way of acquiring a collection. For a
collector's attitude towards his possessions stems from an owner's feeling of responsibility toward his property. Thus it is, in the highest sense, that attitude of an heir, and the most distinguished trait of a collection will be its transmissibility.  

Although the object of Benjamin's analysis is a library, the transmissibility of memory can be extended to other objects, as long as these objects are transmitted with stories.

Benjamin adds a new wrinkle, or fold, to the model of knowledge as ownership when he begins to explore what it means for a collector to inhabit a library: "For inside [the book collector] there are spirits, or at least little genii, which have seen to it that for a collector—and I mean a real collector, a collector as he ought to be—ownership is the most intimate relationship that one can have to objects. Not that they come alive in him; it is he who lives in them." When one has a large collection, one can literally inhabit this collection as an informational topology, this is a type of relationship to information very different from the storyteller. First, storytellers use objects as mnemonic or memory devices. Objects jog the storyteller's memory allowing her to recall a story she has already heard. Storytellers provide the memory and the object just stimulates its recall. This form of memory will always require an interpretive agent to properly decode the memories evoked by the object. This form of memory is like hearing from one's mother how to bake a cake. Second, it is a matter of understanding how the mechanisms that enable the flow of goods (such as record keeping) can be used to provide the information for tracing corporate inheritance. This form of memory is more like the instructions found on a package of cake mix.

Next, I will explore the use of goods as memory devices, paying special attention to the constitutive constraints they place on the transmissibility of knowledge, and the ways that they inform the folding of space and time. I will end this section by suggesting how the political economic change from mercantile to industrial capital implicated subjects differently in informational flows. This opens new opportunities for processing space and time. Although I begin this discussion in order to demonstrate the differences of these two modes of information, I will not fully develop the biological implications of these modes of memory until the final section of the book.

Memory 1: The Poetics of Goods and Stories

New types of relationships came to the fore in a commodity-centered society. As we saw in Parts Two and Three, the conception of a productive individual
provided an initial mechanism for understanding the new ways in which industrial infrastructures processed space and time. As Georges Bataille observed in *The Accursed Share*, the "first effect of pressure" of any excess on an economic system is always "extension."+ "Extension," in this case, is the ordering of experiences through the continuing concatenation of these experiences without any index for cross listing or retrieving these experiences (think here of the elaborate pigeonholes in Spencer Baird’s desk). Records of experiences often existed as narratives of the individual's travels through space and time. This is what we have been calling the panoramic mode.

Writing has a special place in the panoramic mode. It does not just conserve stories; it creates new potentials and new interpretive frameworks. According to Paul Ricoeur, this is one of the tricks supplied by narratives. Ricoeur explains how the poetics of narrative construction act as a bridge between personal and eternal spans of time:

The poetics of narrative contributes to joining what speculation separates. Our narrative poetics needs the complicity as well as the contrast between internal time-consciousness and objective succession, making all the more urgent the search for narrative mediations between the discordant concordance of phenomenological time and the simple succession of cosmological time.5

Narrative is central to understanding, claims Ricoeur, in that it allows for a dynamic sense of time. It does this by providing a bridge between the durations of lived experience and the cosmos. Ricoeur goes on to give non-narrative examples of a few "practical bridges" between these two senses of time. One of the clearest examples is the calendar, which draws from the repetition inherent in myth and ritual practice:

Indeed, it is through the mediation of ritual that mythic time is revealed to be the common root of world time and human time. Through its periodicity, a ritual expresses a time whose rhythms are broader than those of ordinary action. By punctuating action this way, it sets ordinary time and each brief human life within a broader time.6

Myth and ritual thus help integrate the "lived experience of active suffering individuals, into the time of the world outlined by the visible heavens."7 The cal-
endar uses myth to incorporate human time into larger time frames, but also exteriorizes lived time, assigns it chronological dates, and then integrates it into a lexical plane with axial moments (such as the start of the calendar with a prominent figure’s birth). The calendar then “cosmologizes lived time and humanizes cosmic time” in the creation of a “third time.”8 In terms of narratives, this third time is “narrative time.”

Recapitulation, as a specific narrative form, created this third time in specific ways. In recapitulation, the developmental stages of the individual are used to mark and order the developmental sequences of all humanity (if post-birth) or all living creatures (if development in utero is included). This is not merely a projection of one’s own development on the development of all species, however. One of the interesting aspects of development is that it is hard to witness ourselves as we go through it. Thus the story of a single life is not a story of perception and recall. Rather, it requires from the beginning a form of cultural memory for storing and assembling stories of individual lives into a shared sense of the trajectory of lived lives. Consequently, a personal time frame is already part of an extended time frame built on the communication and retention of others’ and our experiences. Much as we saw with arguments on the authorial economy in Part Three, recapitulation stories are not so much expressions of individual properties as they are a formal manifestation of a shared bodily presence.

Recapitulation therefore served as a bridge, similar to Ricoeur’s conception of the calendar; it universalized the development of the individual while it humanized the development of all organisms. But exactly how is narrative used in recapitulation stories to accomplish this? And, is this an adequate model for the manipulation of temporal dimensions in narrative frameworks? These questions will guide our understanding of how closely tied inheritance of goods was with heredity and thus help us understand the importance of acquisition in economic and biological discourse. Also at hand is this discourse’s relationship to the embodied acts of sensing and acting in recapitulationist thought. Finally, we can address how wandering constituted and rewrote cultural memories in this specific fold of time and space.

For London, much of the struggle of creating order in life manifested in the act of writing. This was not only how he ordered his own life; it was also a common device he used to further his characters’ lives in his later fiction. In these cases, either one of the main characters makes his livelihood from writing (as in The Little Lady in the Big House) or London inserts his own presence, often in
the form of a writer, to help his characters order the chaos of perception into a narrative.

The following passage, from his semi-autobiographical novel *Martin Eden*, is especially suggestive in its conflation of London’s own struggle to publish his material with a racial memory of fighting a deadly foe. The violence of the fight calls Eden back to a bestial state (and allows him access to primordial force), and additionally Eden brutally punches his way back to the pinnacle of human development.

Then they fell upon each other, like young bulls, in all the glory of youth, with naked fists, with hatred, with desire to hurt, to maim, to destroy. All the painful, thousand years’ gains of man in his upward climb through creation were lost. Only the electric light remained, a milestone on the path of the great human adventure. Martin and [his opponent] were two savages, of the stone age, of the squatting place and the tree refuge. They sank lower into the muddy abyss, back into the dregs of the raw beginning of life, striving blindly and chemically, as atoms strive, as the star dust of the heavens strives, colliding, recoiling, and colliding again and eternally again.

“God! We are animals!” Brute-beasts! “Martin muttered aloud.9

Dipping into a beastlike condition allowed Martin access to a new ferocity. Martin tapped into a type of “reserve power” that was as violent to himself as to his opponent: “There was a loud snap, and Martin’s right arm dropped to his side. It was broken bone.” Still Martin fought on “only half-conscious,” “battering away at a bloody something before him that was not a face but a horror, an oscillating hideous, gibbering, nameless thing that persisted before his wavering vision and would not go away.”10 Martin’s violence takes him back to a pre-historical memory where violence was the assumed norm and individual identity remained undifferentiated. Tellingly, Jack London does not treat this as metaphor; rather it is a racial memory etched deeply into Martin’s tissues. “And he punched on and on . . . through centuries and aeons and enormous lapses of time, until, in a dim way, he became aware that the nameless thing was sinking, slowly sinking down.”11

As we saw with wandering and bastard birth, creative destruction, or the act of breaking away, remained a middle-class strategy as long as some form of construction followed it. Such is the case with Martin at this point. “And so you
arise from the mud. Martin Eden,' he said solemnly. 'And you cleanse your eyes in a great brightness, and thrust your shoulders among the stars, doing what all life has done, letting the "ape and tiger die" and wrestling the highest heritage from all powers that be.'" Becoming middle class in many of London's stories meant the surprisingly literal rise from the mud and subsequent killing of the beast within, the vehicle that lent the reserve energy for the act of rising. Because of this, London, like many other panoramic subjects, felt very uneasy about simply letting the beast within die. We have earlier interrogated the role of competition in the political economy of the middle-class panoramic mode subject. What interests me now is the role of writing and memory in the ascent to a transformed differentiated subject.

Despite the corporeal drama of this passage, it was the abstract struggle to get his work published that provoked Eden's double descent into childhood and racial memories: "you'll lick the editors if it takes twice eleven years to do it in. You can't stop here. You've got to go on. It's to a finish, you know." This was the type of reserve force that London envisioned it took to create tales that others would read, and in doing so, write a racial archetype that others could follow. In terms of Jordan's metaphor of the groove discussed above, London was attempting to inscribe a new groove for the literate blue-collar worker. Jordan summed this ascent nicely when he wrote that "the growth of man is the assertion of individuality. History is the record of the acts of robust men." Perhaps the operative word in this quote is "acts," for it is through action that "robust" men bridge personal and cosmic time in recorded narratives. Still, the stories of robust men provide the memory for those who follow in their footsteps. Action may move plot, but only writing establishes evolution. Gaining power, however, requires the ability to inhabit a pre-human state, to somehow remember writing before it was writing—to play back the grooves of one's inheritance.

The assertion of one's identity as a storyteller is even more prevalent in The Valley of the Moon. Here London intentionally collapses the functions of author, implied author, narrator, and character to shape Billy and Saxon's destiny by turning repetition into recognizable stories of race. Saxon had reached the nadir of her depression when she came to consciousness standing "knee deep in the water, and about her knees swam scores of big rock rats, squeaking and fighting, scrambling to climb upon her out of the flood." At this point, "a slender, almost frail lad, of twelve to thirteen years ... with sunburned freckled face and large gray eyes that were clear and wistful" sails up to Saxon "in a small, bright-
painted" skill and asks her if she wants to "get aboard." The young boy, named Jack, soon drops "a tiny anchor," "got out the fishing lines and showed Saxon how to bait her hooks with salted minnows. Then they dropped their lines to bottom, where they vibrated in the swift tide, and waited for bites." The fish do not bite at first, so Jack shares with Saxon his lunch and dreams of the future.

Although a poor boy, Jack had used the Carnegie free library to read about faraway places. And although his mother hoped that he would grow up to be a court reporter, young Jack knew that his future could only be found through traveling. "I've lived in Oakland all my life, but I'm not going to live in Oakland the rest of my life, not by a long shot. I'm going to get away... away..." Saxon "thrilled" with him. She too... had lived in Oakland, all her life. And it had been a good place in which to live... until now. And now, in all its nightmare horror, it was a place to get away from, as with her people the East had been a place to get away from. And why not? The world tugged at her, and she felt in touch with the lad's desire. Now that she thought of it, her race had never been given to staying long in one place. Always it had been on the move. Saxon's ancestors were pioneers leaving behind the calcified social inheritance of the East Coast to find new resources. Wandering provided Saxon and Billy a means to break from a social system that failed to honor their racial gifts. If done correctly, wandering could also provide a means to get back in touch with those gifts.

In each of these stories, a form of external cultural memory is needed to reconstitute an internal "racial memory" and give it meaning. Intelligent action, as a way of broaching the mechanical grooves of inheritance, required writing. For Martin Eden it is the possession of enough robust energy literally to write his own story; for Saxon it is the rewriting of stories evoked through her material possessions, a trousseau that held her mother's writings and belongings. Along with her mother, the trousseau had "crossed the Atlantic by sailing ship and the Plains by ox team." Although it is a plain cabinet of knickknacks having little economic value, this vessel is important as a form of cultural memory. It is no coincidence that Saxon stores her mother's writing in the trousseau. These stories constitute Saxon's cultural and racial heritage. "With the old religious awe, she pored over her mother's poems in the scrapbook."

When goods and stories form the basis for evaluating "good breeding," the
written word preserves and generates. Reading stories animates the past while writing new stories provides a medium of variance for new types of inherited futures. Although I noted in Part Three how the conservative logic of recapitulationist thought often demanded that these new futures included the rewriting of the past, I want to highlight a slightly different aspect of this relationship here: the close relationship between writing and embodiment. Far from the radical displacement of being that we encounter in the critiques of writing from Maurice Blanchot and Paul de Man much later in the twentieth century, writing was seen as important precisely because it provided a way to access and bring forth latent forms of being.20 In the hands of those writing to wander the field of evolutionary possibilities, writing became an experimental medium where the boundaries of narrative construction were often constrained in a way we might think about biological change over generations.

This bond between writing and thought is especially useful for understanding how theories of heredity that were presented as narratives were written from existing fragments of preserved culture. Writing allowed one to create coherent structures from seemingly unrelated fragments. This is very different from thinking of the writer's task as passively representing a world already structured. A brief glimpse into the ways in which some thinkers used writing to process information into stories on heredity is useful for understanding how these thinkers tried to create new and compelling stories from the discourses they received.21 A quick glance at how David Starr Jordan wrote his stories provides insights into the relationship between storied biological knowledge and culture in the period.

Jordan published an amazing number of articles, pamphlets, and books during his lifetime. The official bibliography provided by Stanford Special Collections lists over three thousand published entries. Much of Jordan's prolific output, however, was a result of his extremely efficient use of written resources. This efficiency also lent a remarkable amount of homogeneity to an incredibly diverse body of work. (Besides writings on eugenics and naturalism, Jordan wrote poetry, geography, book reviews, stories for children, social theory, philosophy, and general academic addresses.)

Jordan's writing technique faithfully mirrored his ideas on the origin of the species. Novelty in both cases came gradually through selection of stories that one had at hand. The more stories one remembered, the greater the potential for interesting new combinations. The key to selecting the stories, however, was the form used for their preservation. Jordan's story fragments were ordered
through the use of notebooks. In effect, Jordan applied the most dominant information gathering device of naturalists at this time (the other being specimen collection) to his career as an educator, intellectual, scientific theorizer, and political advocate. In fact, Jordan used a few of his old naturalists’ notebooks to record social observations. Thus descriptions and sketches of fish share the pages with newspaper clippings and penciled quotations from his favorite writers.

It is easy to take the notebook for granted now, but it was a compelling method for preserving cultural memory and suggested definite ways for handling data. Jordan kept a small pocket diary on his person and would record quotations or observations on the spot. The pages within these diaries were only loosely ordered chronologically (although each of the diaries are labeled by year and collected in sequence) and the writing looks rushed. From these notebooks, Jordan harvested especially important stories, quotes, and sayings by collecting them into a well-ordered larger diary, and then dramatically crossed out the transcribed passages. When he wrote, then, he had this cultivated collection of cultural fragments and observations ready at hand, useful to illustrate an argument, or self-consciously to quote a well-known author demonstrating his own broad cultural inheritance and thus the authority to speak on a topic. Take for instance, the second phrase of the first sentence of his autobiography, “the gate of gifts is closed.” Jordan not only used this phrase before publishing the lecture The Heredity of Richard Roe (which, by the way, was published at least three times in different formats), it was sprinkled throughout other works.

As some readers might recognize, this fragment is a quotation from Ralph Waldo Emerson. It found new life by surviving the selection process of Jordan’s literary practices. The overall effect was a unified body of work that self-consciously reconfigures a literary inheritance into a literary statement about biological inheritance. For Jordan these two types of inheritance were not far removed. He even claimed that words went through a form of natural selection, although he didn’t necessarily recognize how he refixed this in his own personal practices:

Words, like species of animals and plants come from divers places and may enter or pass through many languages.

The language to which a word belongs may be a matter of minor importance in its evolution. Struggle for existence between words—[Such as] begin vs. commence.
Although tempting, it is surely incorrect to think that Jordan saw these two forms of evolution as only metaphorically related. This interpretation would pay too little attention to the importance of selection in both forms of evolution. In some ways, selection was the dominant principle of interest: whether forms of life or words, they were dependent on the raw materials of selection.

In the beginning of his 1901 popular article on eugenics "The Blood of the Nation," Jordan suggests that national heritage was, in fact, exchangeable with biological heritage. "In this paper I shall set forth two propositions, the one self-evident, the other not apparent at first sight, but equally demonstrable. The blood of a nation determines its history. This is the first proposition. The second is: The history of a nation determines its blood." Jordan realized that using the term "blood" at this date was an anachronism, but still claimed that "the old word serves our purposes. The blood which is 'thicker than water' is the symbol of race unity. In this sense the blood of the people concerned is, at once, the cause and the result of the deeds recorded in their history." Blood may be thicker than water; the interweaving of inheritance stories is what makes it so, however.

What is interesting about Jordan's parsimonious style of writing is that he conserved pithy quotes as opposed to extended passages. Jordan would then reweave these quotes into new stories. The repetition of a quotation from a known cultural authority lent Jordan credibility as an observer who shared the cultural inheritance of his readers. The overall result would appear as a nugget of Jordan's literary inheritance animated and expounded by Jordan's observations. This weaving of old fragments into new stories helped strengthen the implied author in two ways: it gave the appearance of transmitting an important piece of a shared cultural legacy, and it repeated this piece in a context that might have greater meaning for Jordan's contemporaries. The product was still a story, however, and thus shared a bit of the storyteller. According to Walter Benjamin, this is what distinguishes a story from information. A story does not aim to convey the pure essence of the thing, like information or a report. It sinks the thing into the life of the storyteller, in order to bring it out of him again. Traces of the storyteller cling to the story the way the handprints of the potter cling to the clay vessel."

Repetition, in this conception of time and memory, establishes continuities in a narrative and reduces the flux of experience into recognizable themes. Consequently, the multiple retelling of simple stories is more important for establishing a narrative identity for inheritance stories than telling an intricately
constructed story once. This is why Ricoeur makes the aporia that leads to the figuration of narrative identity, part of the active figuring of narratives that happens within a community. The re-figuring of stories "is defined by the narrative identity of an individual or a people, stemming from the endless rectification of a previous narrative by a subsequent one, and from the chain of figurations that results from this." 27

Some turn-of-the-century writers used recapitulation as a narrative device to travel these traces left by cultural memory to inhabit a past inaccessible through cognitive memory. 28 Much like Benjamin suggested with the storyteller, as a pinnacle of evolution, one possessed the evolutionary traces of all creation. According to Jordan, "In this calculation there is always a bit of residuum left, in which each ancestor back to *Pithecanthropus erectus* of Java... can find his allotted share." 29 The trick was gaining access to these virtual pasts. G. Stanley Hall's student, psychologist G. Harold Ellis, equated this shared heritage with the Freudian subconscious. One could feel earlier racial states when one became unconscious. Ellis writes "the old saying that parents live again in their children is no less true than that the child lives again the history of the race," meaning that this shared life is a subconscious link of shared experience. 30 Often these shared experiences would manifest when one entered that special doorway of the unconscious, the dream. Ellis claimed that "psychologically there are many things explained only by the recapitulation theory. In dreams, the old racial fears often make nights miserable." 31

Jack London used the unique properties of storytelling to allow his characters to experience "racial memories." In his speculative novel *Before Adam*, London's protagonist was haunted by visions from his evolutionary past as "the missing link" between hominid and human evolutionary states. "Some of us have stronger and complete racial memories than others." 32 Some people may believe these memories are past lives, or reincarnation. "But they are wrong." 33 "This other self of mine is an ancestor, a progenitor of my progenitors in the early line of my race, himself the progeny of a line that long before his time developed fingers and toes and climbed up into the trees." 34

Dexter, the protagonist of London's *Star Rover*, uses his time locked in solitary confinement to travel through these racial memories.

I am that man, the sum of him, the hairless biped who struggled upward
from the slime and created love and law out of the anarchy of fecund life
that screamed and squalled in the jungle. I am all that that man was and did
become. I see myself, through the painful generations, snaring and killing
the game and fish, clearing the first fields from the forest, making rude tools
of stone and bone, building houses of wood, thatching the roofs with leaves
and straw, domesticating the wild grasses and meadow roots, fathering them
to become the progenitor of rice and millet and wheat and barley and all man-
ner of succulent edibles, learning to scratch the soil, to sow, to reap, to store,
beating out the fibers of plans to spin into thread and to weave into cloth,
devising systems of irrigation, working in metals, making markets and trade
routes, building boats, and founding navigation—ay, and organizing village
life, welding villages to villages until they become nations, ever seeking the
laws of things, ever making the laws of humans so that humans might live
together in amity and by united effort beat down and destroy all manner of
creeping, crawling, squalling things that might destroy them.

I was that man in all his births and endeavors.35

London used narrative as a tool for exploring a primordial virtual space of racial
development. It was the close relationship between literary and cultural inher-
itance that allowed him to do so, however. Narrative provided a virtual domain
that allowed writers to experiment with stories about racial and cultural ident-
ity. Although highly abstract, it was the close configuration between stories and
heredity that allowed writers to use stories to traverse racial pasts. In this circuit
of memory, goods, and heredity, stories were used to record hereditary relations-
ships as well as to explore the conceptual dimensions of an evolutionary
landscape. Ricoeur acknowledged the importance of this type of virtual space
in his argument for the creative aspect of storytelling: “Our analysis of the act
of reading leads us to say rather that the practice of narrative lies in a thought
experiment by means of which we try to inhabit worlds foreign to us. In this
sense, narrative exercises the imagination more than the will, even though it
remains a category of action.”36 Often, the “missing links” of evolution were filled
by the ability of narrative to bridge temporal sequences. When circulated, these
stories linked together a literary inheritance with a biological inheritance.

Even novels not explicitly dedicated to exploring racial memories used sto-
ries to manifest racial pasts. For instance, in The Valley of the Moon, Saxon confirms
Billy’s inheritance through a racial memory that came to her while watching
Billy fight: “There was no anger [in his face]. Nor was it even pitiless. It seemed to have glared as hard and passionately as his eyes. Something came to her of her wonderful mother’s tales of the ancient Saxons, and he seemed to her one of those Saxons, and she caught a glimpse, on the wall of her consciousness, of a long, dark boat, with a prow like the beak of a bird of prey, and of huge, half-naked men, wing helmeted, and one of their faces, it seemed to her, was his face.” Saxon’s memory of her mother’s stories confirms Saxon’s ideas about Billy’s heredity. As London’s work suggests, creating plots often meant using the special properties of a conceptual space to set stasis in motion—to bridge the gap between the moments. A structural stasis is thus overcome through the poetic act of writing. Writing literally inserts the “missing link” that transforms static categories into dynamic evolutionary frameworks.

As long as goods and stories remained the repository of evolutionary memory, the poetics of evolutionary thinking remained constrained along the axes of ownership and writing. Much as the phonograph needle can read deformations in a wax or tin cylinder and turn these deformations into sounds with meaning, most individuals primarily animated what had already been scratched in the biological past. Where the phonograph analogy falls short, however, is that it suggests a radical and much too modern conception of the relation of playback and retrieval in the informational circuit of goods and stories. In what I call memory 1, the sensory-motor capabilities of the embodied interpreter of stories remained important for animating information about heredity into embodied presence. For instance, Saxon could play back family memories by reading the deformations in the surfaces of the trousseau or by kissing her father’s sword. “Saxon kissed the bullet hole in [the trousseau], made in the fight at Little Meadow, as she kissed her father’s sword, the while she visioned him, as she always did, astride his roan war-horse.” The phonograph analogy fails in this scenario when it becomes ambiguous who (or what) is being scratched and what (or who) actually holds the stories. It lacks the radical differentiation between storage and retrieval that we have with mechanical recording technologies. Because of this, the stories must, in some sense, stay local—often still within an embodied interpretive agent like a mother or other adjudicator of good breeding.

With the rise of new technologies for record keeping, the stories were sketched into the medium itself, displacing the interpretive agent into an institutional or pedagogic setting. This is a process that I referred to as corporate inheritance in Part One. Again, it is not that the body disappears; rather, the body
becomes implicated by time in new and interesting ways. With the advent of recording technologies, time could be juxtaposed and manipulated by altering the medium of recording and playback, much as media historian Friedrich Kittler recognized in the way that the phonograph replaced a musical string: “The measure of length is replaced by time as an independent variable.” The ability to record and order extended pedigrees would open up new temporal dimensions remarkable for their ability to fold time and space in new ways.

Understanding exactly how it accomplishes this, however, requires a brief detour through the theory of time and space in relationship to motion. In Book IV of the *Physics*, Aristotle suggests that time cannot be reduced to movement but movement must happen within time. Time is a measure of movement. It is important to note that for Aristotle the concept of “movement” included all forms of change such as changes in extension (such as locomotion or growth and decay) and changes in intensity (such as changes in the degree of a quality). More recently Henri Bergson and his followers have echoed many parts of this Aristotelian notion of time as movement. The basic claim is that the perception of time cannot happen outside the perception of space. It still is a matter of great debate, however, how time and space are linked in experience. In a sophisticated argument that pits Bergson against the claims of Gilles Deleuze in his film studies, Mark Hansen has recently suggested that Deleuze thought that “time-image” of cinema was a “fundamental break with the sensorimotor logic of the movement image.” The implication of this claim is that time cannot be conceived of outside of a conception of space.

My research on the temporal dynamics of record keeping suggests that Mark Hansen’s critique is an important first step to a greater understanding of time in relationship to media. One must start from the realization that time is composed of difference. What Bergson has labeled duration is already a form of difference or change. Duration therefore emerges in what William James would call a conjunctive relation between moments. According to James, these relationships are just as important as the elements themselves (this can also be developed as a consequence of Merleau-Ponty’s conception of space). As James suggests, “the relations that connect experiences must themselves be experienced relations, and any kind of relation experienced must be accounted as ‘real’ as anything else in the system.” Not understanding this draws one back to an earlier form of empirical understanding that considers elements as disconnected from each other while relationships constitute a special type of qualitative relation-
ship outside of the elements. Consciousness is always already a perception of durations, while the perception of time constitutes the new, and very real, emergent relationships between these durations.

Consequently, the followers of Bergson are correct in noting that there is no perception of time without a perception of space. All perception happens in a field of spatial relationships. Where they might mislead, however, are in the overzealous attempts to suggest that all types of perceptions of time can be reduced to movements. As a relational property, time is dependent upon but not reducible to movement. For instance, the perception of spaces not only perceives these spaces but the relationship between them. In this case, this translates into an awareness that something else could always have happened. The phenomenological sense of time, therefore, can be defined as the perception that something else could have happened. This suggestion of the multitudinous possibilities for things to come about, then, suggests that there is an integrity in the perception of time that cannot be reduced to a perception of movement.

In a phenomenological sense, then, time is the potential for change in the world. Movement, in the Aristotelian sense, is the change that actually happens. Since the recognition of potential can only happen through its actualization, there exists no conception of time without a means for gauging and recognizing some type of change. It is important, however, not to collapse the potential for change into the changes that actually happen. This is one of the problems of narrative as covered in Part Three. It projects all change as a specific change. For instance, the evolutionary sequence of hominids ends with the culmination of ideal man. Conceiving of potential for change allows for how one can conceive of the potential for something to be something else.

Now we are prepared to answer, exactly how does record keeping open up new temporal horizons? When one records something, one changes the movement from one state to another, and this changes the durations that make up the perception of time. Although one needs to alter one’s movement to change one’s perception of time, this alteration in movement also potentially affects the scope of future events. A simple example of this is how slowing the swinging of a pendulum gives the impression that time is passing much more slowly. When one keeps records, one does not just record what happened (since one does not know exactly what will occur), one records a field of possibilities for how different things can occur. This is the power of record keeping, it allows one to be surprised by the world and then reorder the events that led to this surprise. In
other words, it allows one to order events not only by what happened but by the potential for different things to happen. This then is what Deleuze suggests when he claims that the time-image allows one to order space through time (as opposed to the other way around). When one orders spatial relationships by time, one orders what happened by the potential that something else could happen. Time can be used to refer to movements outside of the sequential logic of a spatiotemporal sequence, helping to compare certain types of movements that might not be comparable otherwise.

The difference between time as change and time as the potential for change is the difference between a poetics of the subject and a poetics of a subject inhabiting a complex or monstrous world. First of all, the motor of change moves from an active agent moving through the world to the world itself as inhabited and perceived by the subject. Recognizing time as an “independent variable” recognizes the importance of the potential for unforeseen changes to occur, changes that cannot be reduced to the activity of the individual. Secondly, discerning potential for change requires much more “processing power” than discerning change. One needs to be able to discern patterns of change and not just individual changes. Imagine a computer game character that inhabits a specific gaming landscape. If we already know what this player will do, we only need the computational power to render the landscape that encompasses the player’s movement. If the character has many choices for action, however, we need the computational power to render the landscape (or potential) for all those choices.

Turning this example on its head allows us to see how turn-of-the-century record keeping as a form of information processing allowed for the recognition of possible patterns of inheritance. If one can only see the player and not the terrain (think of the terrain as the enabling structures of inheritance) and one already knows what the player does, one can discern important aspects of the unseen terrain by recording the actions of the player. A hill, for instance, will be marked by the rise of altitude of the player. If one wants to discern the landscape independent of the action of a single player, then one has to record the actions of many players over the terrain. This is the equivalent of charting out the possibilities for other things to happen. This then enlarges the temporal horizon of one recording the actions. This ordering of what could happen opens up a knowledge of the potential types of engagements that future players might face. This knowledge of the future, however, is always tempered by the knowledge that something else could still happen. Importantly, a sense of space and
time emerges that is not reducible to the actions of an individual. Time in this example is the potential for change in the action of the individuals and the sense that a new and different individual could help us render the landscape a bit more fully.

This point is extremely important for understanding the emergence of genetic rationality. Organisms exist within time and these temporal relationships cannot be reduced to spatial relationships. There was a time when movement, or more specifically, changes in geo-spatial location, was thought to be the predominant driver of evolution; for David Starr Jordan, locomotion drove evolution. With the advent of new recording technologies, time was more directly implicated in the origin of the species. Having the ability to record the traces of movements in the species allows one to envision the mass of movements that allow for interesting new heritable patterns. It opens up a whole new world for understanding the potential for change.

**Memory 2: The Material Poeisis of Information**

Although mass production made goods available to those who could afford them, the wide distribution of these goods contributed to the loosening of how they were implicated in making meaning. Removed from traditional avenues of dissemination, consumers appealed less to embodied agents for advice on how best to use these goods. One solution for ensuring the fidelity of use for consumer goods was the production of new forms of information intended to help users navigate the proper use and display of goods in the absence of the interpretive agent. A fitting example of this is Edith Wharton’s co-authored book on interior decorating, *The Decoration of Houses*. Intended as a treatise on how to exercise good taste in the “gilded age of decoration,” this document literally revealed what one had previously internalized through good breeding. As Susan Strasser, among others, has noted, much of the early twentieth century’s commodity culture was a means for informing a consumer’s use of a product at a distance.

This change was not lost on London, Norris, or Dreiser, each of whom portrayed himself as storyteller of the “common man.” London, for instance, attributed the cruelty of his motifs to a desire to reach the common man; he argued that the “uncultured mass cannot become cultured in the twinkling of the eye… And wherever the mass is admitted into living, wherever the common men for the first time grip hold of life, there must be a falling away from all that is fine
of tone and usage, a diminishing, a descending to a something which is average, which is humanly average." Writing the book of racial memories in memory 2, predicated as it was on the dynamics of mass communication, could not just take place in stories or images; it required whole institutions to insure fidelity of playback: research labs, Progressive Era reforms, and mass-distributed mores. These new forms of social memory worked through the infrastructure for distribution of products more than through the products themselves. This gave the products the seemingly magic ability of allowing nature to speak for itself by circumventing the importance of an embodied authority.\textsuperscript{36}

The new excess of goods led both to a new luxury and to new problems of management and control. "The second effect of pressure," wrote Bataille, is "squander or luxury."\textsuperscript{39} If we understand squander as a quantitative accumulation that can, eventually, lead to qualitative innovations, then we can understand how communication scholar James Beniger's work on the Control Revolution added historical specificity to Bataille's insights on the political economy of excess.\textsuperscript{39} As we saw in Part One, attempting to "harness" luxury into socially productive avenues required new forms for processing information at the corporate or systemic level. As the infrastructure to produce and distribute new goods came into play, new circuits for recording memory were instituted. As Bataille recognized, "The surplus is the cause of the agitation, of the structural changes and of the entire history of society."\textsuperscript{32} It was the very volume of the exchanges that demanded new ways for triaging goods, and this triage displaced memory to a different type of body-goods-society circuitry than experience. In effect, the recording and the playback functions of social memory became functionally differentiated systems. This opened up new possibilities for recording memories as well as new forms for creative and professional expression.

William James reflected this differentiation in terms of physiological memory. According to James, what was commonly referred to as "memory" actually included two processes: primary memory, or the endurance of the past in experience, and secondary memory, or "true memory," which involved recalling a fact after it had dropped from consciousness. These two forms of remembrance required different paths through inner experience: "The only hypothesis, in short, to which the facts of inward experience give countenance is that the brain-tracts excited by the event proper, and those excited in its recall, are in part different from each other."\textsuperscript{53} James suggests that once memory and experience were uncoupled, one could maximize one's true memory using specialized practices that could
improve the ability to associate facts (as opposed to physiologically changing one's capacity for memories). This led James to surmise that "all of memory consists, then, in the improvement of one's habitual methods of recording facts." In other words, the dissociation of memory from experience allows one to concentrate on maximizing retention by improving access to the repository of memories. This emphasizes a circuit of experience beyond the direct communion with an object: memory is, in fact, a "system" wherein "every fact is connected with every other by some thought relation. The consequence is that every fact is retained by the combined suggestive power of all the other facts in the system, and forgetfulness is well-nigh impossible." According to James, those interested in extending memory thus need to improve the recording of the systemic properties of relations and not just extend the recording of facts. As we will see in the next section, the technologies for improving the systemic capabilities of industrial production and distribution were applied to improving the social memory of biological relatedness as well.

More recently, Michel Serres has cast the division between recording and playback into informational terms. According to Serres, "those who have energy necessarily cannot have information; thus, those with information can do without energy." In memory 2, force is no longer enough for rewriting the grooves of habitual action, since energy is now conceived of as separate from information. This insight is important for this section because it allows me to refine my discussion on the political economy of exchange and scientific knowledge initiated in Part Two.

Moving from a scientific paradigm predicated on possession (such as natural history) to one predicated on exchange (such as genetics) required at least two analytical steps. As I have discussed before (see chapter 3), the first step was recognizing the importance of exchange. Although this may seem elementary, it has been difficult for many thinkers to appreciate the tangible consequences of exchange. Exchange is not a thing; it is a relationship. Consequently, for many thinkers, exchange exists in a different metaphysical state than do things in themselves. From this perspective relationships are not tangible and should not be treated as real. We have been able to avoid this perspective by utilizing William James's notion of radical empiricism, in which relations are maintained as of the same metaphysical order as things in themselves. Exchange is more than perceptually real; it is pragmatically real as well. As we earlier saw, exchange introduces new spaces into a society, such as the space of flows, and brings with it
new forms of record keeping and analysis. The increasing prevalence of exchange also changes many of the tropes used to understand the world. The trope of wandering, for instance, fits a mercantile economy where one wanders to acquire goods. Wandering does not fit the same way in an industrial economy, however, where the infrastructure for distributing goods is already in place. In this case, wandering adds a new aesthetic register. Wandering became an appropriate response to industrial modernity precisely because it promised to re-link the sensory-motor apparatus to stories and civil development. From a phenomenological perspective, one can use Maurice Merleau-Ponty’s notion of the invisible, as that which cannot directly be experienced but structures most of what can be perceived, as a profitable heuristic for thinking about how exchange makes certain experiences tangible and thus renders them visible.58

The second analytical step needed is to recognize that all exchanges are asymmetric. Exchanges are not zero-sum gains. All exchanges take place over time and leave traces. Consequently, all exchanges cannot be reduced to a simple exchange of signs as Jean Baudrillard feared. Exchanges generate information, and for the turn-of-the-century thinkers I examine here, making this information culturally productive required developing new record-keeping technologies that allowed for amassing greater amounts of information, new types of search and retrieval strategies, and new ways of cross-indexing information. This is where the importance of new record-keeping technologies came into play. This brings us new insights into how instruments were used to re-examine the relationships to bodies in time and to provide new models for thinking about inheritance.

The informational practices allowed by a growing industrial infrastructure are different than the informational practices allowed by the goods themselves. They offer up new forms of social memory and new forms of possible futures. Although I will discuss in more depth the specific informational practices adopted by some researchers in experimental heredity in Part Five, it is important to note at this point where these practices come from. As the number and frequency of goods increased, individuals adopted new tools to see that these goods were effectively distributed. These technologies (including some I have already mentioned such as middle managers, vertical files, and standardized forms) needed to deal effectively with the economies of scale utilized by industrial enterprises. Although these technologies were often products in themselves, they were primarily intended to streamline the operations of an industrial infrastructure. Consequently, they proved uniquely useful for dealing with the record
keeping needed to keep track of large numbers of samples, hence providing new horizons of space and time beyond the constraints of object, memory, and stories in what I have called memory 1.

The agency of the individual is also refigured through this new form of processing information. An individual agent moves in a world of things. Bataille describes this in *The Accursed Share*: "If we are in search of an object of possession then we can only purpose to look for things, since only things are in the province of activity and the search always commits us to activity."58 Hans Ulrich Gumbrecht has more recently claimed that, with the rise of the hermeneutic field and its emphasis on the production of meaning, "world appropriation through the human body, that is, through the human senses, was now appearing as an epistemological option."59 The drawback to this conception (which is akin to memory 1) is that it highlights the distinction between the subject and the object and privileges a specific type of agent to bridge that distinction. This mode of information processing is too limited, however. In terms of social memory, when one constitutes one's self-conceptions (or memories) through things, then one envisions the future through the material properties of the world of things. Poetics remains a function of the imaginative artist and memory is predicated on one's ability to acquire.

The material poiesis of informatics, on the other hand, creates new forms of embodiment precisely through the constitutive constraints of embodied space and time.60 We too often think of constraints as only selective. Selective constraints are top-down and create order through exclusion. Constitutive constraints, however, create new possibilities from order. For instance, these are the material constraints of paint, brush, and canvas, as a painter struggles with the limits of her medium to see what has not been seen before. Whereas an emphasis on selective constraints emphasizes the things that will be selected and the properties of the process of selection, an emphasis on constitutive constraints emphasizes the relationship between things and the possibilities that this relationship engenders (please see my discussion of potential and information processing above). Once one realizes the nonstrosity of the world (or the ability of the world to wander), creation, in effect, happens between subject and object as a property of embodied existence within an infrastructure or environment.61 This highlights what Edmund Husserl elegantly called, "the variation from itself of the entire system of appearing."62 Perception now is always the perception of subject and object in a specific environment, thus allowing for the perception of the
variation of variation. Borrowing from Gregory Bateson's definition of information, in this scenario, information is "any difference [the variation] that makes a difference [the variation in the system of appearing]." The registration of these variations (as opposed to the elements themselves) provided new forms of cultural memory.

This complex insight is a bit easier to grasp by looking at specific examples of how this worked in genetics. As I have been arguing, detailed record keeping allowed for a new folding of time through the manipulation of the material basis of the technology itself. For instance, vertical flies allowed for new juxtapositions of data and the ability to glimpse emergent functional qualities outside a simple single chronology. Given my initial definition of space as the set of possibilities that connect us, these practices can then also be conceived of as spatial in that they open new forms of connectivities (what William James called "conjunctive relationships"), or the means and possibilities for envisioning the interdependencies of organisms. As we saw in Part Two, these new forms of connectivities are in actuality new forms of knowledge in their linking of knowers and known. They are new pathways of experience and provide a field of new possibilities for future conceptual wanderings. These connectivities, then, allow for new conceptions of biological and social interrelatedness and provide the eventual basis for new conceptions of life.

The relationship between narrative and experience is redefined as well. The path that the story has wandered now needs to be accounted for. This is where my work detailing the phenomenological experience of time in relationship to political economy and social memory emerges in importance. The identity of a subject or object is not constituted through an essential quality but through its unique trajectory through space and time—through its wandered path. Narrative remains important in that it helps us constitute that path after the fact. This entails more than just recounting plot, however. As philosopher Alicia Juarrero recently has written, "explaining which of several alternatives happened and why therefore requires describing background and context in sufficiently vivid and concrete detail to reconstruct retrospectively both the internal dynamics and external circumstances as well as the way that they interacted." Complex moments of change are important precisely because there is no shortcut for explaining them. Juarrero elegantly suggests this when she claims that these types of "changes embody essentially incomprehensible information. That is, there exists no law or algorithm more concise than the process itself that can capture
and describe what happened." In other words, there is no shortcut through experience to meaning. Complex or traumatic experiences bear witness to this. These experiences expose our shortcuts for making sense of the world by demonstrating how inadequate conceptual categories are for making sense of the enormity of these experiences. One has to experience them to understand them.

Only now do we have the conceptual tools to understand how changes in information-processing practices opened up domains for describing the connectivities (or conjunctive relationships) between individuals. By utilizing many of the recording techniques covered in the next section, experimental genetics worked with dramatically larger scales than narratives could. These scales allowed for the folding of space and time so that an extensive library of stories could be created. In this sense, a genetic experiment was a search through a number of potential life stories in an attempt to identify a variance not previously incorporated into other stories. Experiments are important precisely because they allow us to fold space and time in new and interesting ways. Brian Massumi has recognized this as well: "Properly scientific method starts from a preconversion of surprise into cognitive confidence." 

Although informational subjects (the subjects that inhabit and use the modes of what I have called memory 2) do not have the heroic agency that narrative subjects have (the subjects that inhabit and use the modes of memory 1), they still feel, think, and act, and this is important. This form of agency comes from a poetics of individuals always already in an environment. It is informational precisely because environments and individuals have the potential for change. Feeling, then, is never just feeling of the self, it is always feeling of something and thus it connects us rather than removes us from the world. Or as William James notes, "Whoever feels his experience to be something substitutional even while he has it, may be said to have an experience that reaches beyond itself. From inside its own entity it says 'more,' and postulates reality as existing elsewhere." As this quote suggests, this type of interaction with the world is inherently paradoxical because it always involves acting first on the self. It remains an agent, however, because selves are never complete unto themselves, the self is always intermixed with the world because it is a part of the world. An informational environment is an agent that acts on the self and then finds that this act echoes back from the world transformed, unanticipated, and informative. This echo or resonance is "informed" but not determined by the act. The wandering subject remains informative precisely because it informs and does not represent.
Perhaps it is no coincidence that one of the individuals most often blamed for the policies that led to the national aporia of unemployment is David Starr Jordan's star pupil, the engineer Herbert Hoover. Could it be that the "crisis" of overproduction came about because of the existence of a model of human agency that privileged action at the expense of affect and sensation? Resolving this issue is beyond the scope of this book, yet one lesson is clear: conceptions of production are intimately tied to how we view ourselves and our relationships to the world. We ignore what the world is telling us at our own peril.

It is important to stress that recognizing our embeddedness in the world does not necessarily lead into an affectless dimension of existence. Rather, recognizing our embeddedness is one of the most moral ways to engage actively with the world. In this sense, Merleau-Ponty's conception of flesh as chiasm or crossing is especially fruitful. According to Merleau-Ponty, although object and subject, self and world, or mind and body are separate, they are always only ever provisionally distinct. They exist intertwined with and in each other. Self and environment are always provisional definitions. For most embodied processes, differentiation is never the starting point but a process, and this implies that although we are never reducible to the world, we are of the world. Thus, we should pay attention to our heritable constitution as one of the places where we cross with the world, where we literally carry the world with us. We should resist the temptation to see these engagements as encounters with the thing in itself, in this case either the gene or the environment. These engagements will always be embodied and situated. Yet these engagements also always promise to lead us to an elsewhere beyond what we could have imagined in the first place. This is not a transcendence away from an embodied state, but a new fold in an immanent entwinning. It is always "situated" and then some. This will remain true as long as our bodies are more than what we can conceive of them to be.
CONCLUSION

New Folds in Space and Time

In Part Four, I have used the prominent panoramic mode trope of "wandering" as a means of hybridizing a theoretically concrete position on the role of information processing with locomotion, sensation, and affect. Specifically, I extended earlier observations of class-based notions of distinction (Part One), the phenomenological domain of epistemological practices (Part Two), and the relationship between developmental thinking and narrative (Part Three) to understand the complex relationship between property acquisition and cultural memory. The next section characterizes one of the products of this hybridization: how new information-processing technologies opened up new ways of conceiving of biological relationships. Before we move to that characterization, it is important first to pause to suggest just how much cultural work the trope of wandering and its mediation of the two folds of processing space and time still does for us.

The conceptual ecology is complex. The interactions between memory 1 and memory 2 contributed to remediating forms of wandering in old and new cultural products. Modern wanderers literally wandered the industrial infrastructure (using trains or cars) as a means of exploring the opportunities at the edge of an industrial society, as opposed to exploring the immediate countryside on
foot. It is no coincidence that two of the literary figures covered here helped promote this type of vision: Jack London on the railroads with *The Road* and Theodore Dreiser with the automobile in *Hosier Holiday.* Other wandering figures emerged at this time as well. In 1914 Charlie Chaplin appeared in what would be his most enduring screen persona, the little tramp. In this film Chaplin mimics the action on the screen as he mimed the actions of the cameraman. It is possible that much of this figure's popularity came from its complex relationship to industrial systems. Needing to participate in but never being quite contained by modern society, the wanderer provided a comforting counter-voice to emerging industrial systems that were more interested in evolving than moving. Much like Malcolm D. Forbes's naturalization of the capacity to trot in horses (see Part One), the tramp achieved his cultural authority through the complex relationship between two durations of memory in modern society. Today it is easy to look back at these wanderers as misfit romantic longings for an earlier era. This ignores, however, the agency of the informational subject. Wanderers were more than critics of industry; they were explorers offering up new ways to use industrial infrastructures. In this regard, they experimented on themselves as agents constituted within an environment.

One last biological example demonstrates the fecundity of looking at how information processing allowed for new folds in the processing of space and time, the phenotype/genotype distinction. Researchers began using the new ways of folding space and time to parse out the different kinds of variance exhibited by organisms. Importantly, this work depended on sequestering organisms from environmental fluctuations. This allowed researchers to differentiate two types of biological variance: variance due to environmental conditions and variance due to genetics. Mapping the variance due to genetics would at first require the tools of memory. This in turn allowed for a differentiation of two types of cellular environments: the nucleus, removed from the vagaries of experience, where the durations of chemicals crossed with the durations of the cell governed the dynamics of heredity, and the cytoplasm, where the body and world productively co-mingled in the durations of dynamics in action. These were not so much co-constitutions as a type of wave analysis, such as Fourier-transform analysis, that breaks complex waves into simpler constituent waves. The complex durations of embodied time were parsed into two new distinct durations. I have been calling these durations memory 1, the relationship between goods and stories,
and memory 2, the relationship between infrastructure and information. This parsing out also provided new ways of looking at cells and defining cellular spaces. Memory 1 embodied itself as a domain of interaction between environment and organism, known today as the cytoplasm. Once the nucleus was defined separately from the cytoplasm, the cytoplasm was seen as the space of a biological intertwining between genes and environment. This domain is the domain of meaning, agency, and action. Memory 2, on the other hand, embodied itself as a domain removed from the fluctuations of embodied experience. This provided a cellular long durée made possible by memory 2. This space is the equivalent of the index to a set of file folders where candidates for genetic traits could be cross-listed, compared, and evaluated. In relationship to time, the durations of the nucleus are the durations of mostly stable molecules while the cytoplasm exists as a cellular bridge between the lasting duration of chemicals and the fleetingness of our existence in the world. Is it any wonder that the less visible duration of the chemical basis of life needed the more durable record-keeping capabilities of industrial systems to envision and then document it?