Louis Agassiz at the time of his American celebrity

FIVE

AGASSIZ

I

LOUIS AGASSIZ WAS THE MAN for whom the Lawrence Scientific School was created. He was born in Switzerland in 1807, and enjoyed a precocious European success, thanks in part to exceptional energy and ability, and in part to a gift for making himself agreeable to people in a position to promote his career. By the time he was twenty-five he had become a protégé of two of the leading scientific figures in Europe: the French paleontologist Georges Cuvier and the Prussian naturalist Alexander von Humboldt. Cuvier did Agassiz the additional, and no doubt unintended, favor of dying, in 1832, shortly after putting him in charge of a valuable collection of fish fossils, and Agassiz, through his research and publications, soon succeeded Cuvier as the leading authority in that field. His greatest early claim to fame, though, was in another area of natural science: he was one of the discoverers of the Ice Age.

But by 1845 Agassiz was overextended. He had got involved in a scientific publishing business that was losing money, and his wife, unhappy with his finances, his associates, and his obsessive work

habits, had left him. Agassiz turned for help to von Humboldt, who elicited a grant from the king of Prussia for a study of the natural history of North America. To supplement this income, and to introduce himself to American audiences, Agassiz secured, with the assistance of another friend, the English geologist Charles Lyell, an appointment to deliver a series of public lectures in Boston. These were the Lowell Lectures, sponsored by John A. Lowell, the textile manufacturer, who was also a member of the corporation (the board of trustees, in effect) of Harvard College. Agassiz arrived in Boston in October 1846 and delivered the lectures that winter. Their subject was the "Plan of Creation in the Animal Kingdom," and the response was beyond anything even Agassiz, who was not a man to underestimate his own capacities, could have expected. Five thousand people turned up. Agassiz had to deliver each lecture twice to accommodate the crowds.[1]

Agassiz's zoological knowledge—in particular his knowledge of the invertebrates—was fairly prodigious, and he had a knack for conveying it in a style that nonscientists found not only accessible but intellectually thrilling. Many people found Agassiz personally thrilling as well. He was a large, handsome, self-assured man. His eyes were black, his hair was long, and his accent was French. His command of English was deliciously imperfect: when he got stumped for the correct English word during a lecture, he would draw a mollusk or some other organism on the blackboard while he searched his memory for *le mot juste*. Audiences seem to have found this irresistible. He was enormously personable, and he made friends with remarkable speed. He had the ideal personality for scholarly advancement in a city in which intellectual, financial, and social elites were still largely overlapping.

Harvard had been contemplating the establishment of a school of science since 1845, the year before Agassiz's arrival on the scene, but no funds had been raised. When it became known that Agassiz might be interested in remaining in the United States after his European money ran out, John Lowell and Edward Everett, the president of Harvard (and former governor of Massachusetts), persuaded the mill-town industrialist Abbott Lawrence to donate fifty thousand dol-

lars to found the school and to guarantee the salary for a new academic appointment intended specifically for Agassiz. The offer was made in the summer of 1847; Agassiz accepted in the fall, and he began his career as a Harvard professor in the spring of 1848. The collapse that year of the liberal revolutions in Europe, one consequence of which was the closing of the Swiss academy where Agassiz had been teaching, led to a minor exodus of European scientific talent to America, and essentially sealed Agassiz's decision to become an expatriate.

Agassiz's estranged first wife died, of tuberculosis, in Germany in 1848, and in 1850 he married Elizabeth Cabot Cary, an event that completed his conquest of Boston society. Elizabeth Cary was the daughter of a wealthy lawyer with connections to the Lowell textile industry; she had once been courted by Charles Sumner. Her sister was married to Cornelius Felton, later the president of Harvard, and Elizabeth herself was an educational pioneer: soon after the marriage, she started a school for women in her home to raise money for her husband's research, and she eventually became the first president of Radcliffe. Agassiz had three children from his first marriage, all of whom moved to the United States and married into prominent Boston families—the Shaws, the Higginsons, and the Russells. It is an indication of how commanding a presence Agassiz was in Boston in the years before the war that the Saturday Club—the literary dining and conversation society of which he was a founding member, and whose participants included Emerson, Hawthorne, Longfellow, Whittier, Lowell, Sumner, and Holmes, all at the peak of their powers—was popularly referred to as "Agassiz's Club."

Abbott Lawrence had originally intended to underwrite a school of applied science: he wanted better engineers for his mills. But with the availability of Agassiz the plan changed, and the Lawrence Scientific School was established as an institution that trained researchers. It was a time when almost every American scientist received the specialized portion of his education in Europe (Dr. Holmes, for example, spent two years in Paris as an apprentice to the pathologist Louis before returning to take his medical degree from Harvard). Agassiz represented the introduction of modern scientific edu-

cation to the United States. His Harvard appointment marked the beginning of the professionalization of American science.[2]

Professionalization means disciplinary autonomy. A field of study (or any line of work) is a profession when its practitioners are answerable for the content of their work only to fellow practitioners and not to persons outside the field. One of the things that had held back scientific education in American colleges (there were no graduate schools, strictly speaking, in the United States before the Civil War) was the dominance of theology in the curriculum, which obliged scholars in every field to align their work with Christian orthodoxy. Theology was the academic trump card. Agassiz insisted on the independence of scientific inquiry from religious beliefs—and for that matter, from political and economic beliefs as well. He did not attend church himself, but he was an outspoken deist, and that was evidence enough of religious commitment for a Unitarian institution like Harvard. It allowed Agassiz to secularize scientific research without completely alienating the ministers.

The method Agassiz preached was strict induction. "[A] physical fact," he said, "is as sacred as a moral principle."[3] Rather than deriving the laws of nature from scriptural teachings or from any other set of abstractions, Agassiz's students were required to observe first and construct generalizations later. And by observation Agassiz meant hands-on contact. In one of his first American lectures, on grasshoppers, which he delivered to a group of Massachusetts schoolteachers in 1847, Agassiz supplied each teacher in the audience with a grasshopper. If someone dropped his or her grasshopper during the lecture, Agassiz stopped speaking until the insect was recaptured. The teachers in 1847 found this pedagogy bizarre; by the time of Agassiz's death in 1873, it had become legendary. Many former students later recalled how Agassiz had started them out by handing them a dead fish or some other specimen, and requiring them to produce a complete and accurate description of it before he allowed them to proceed. To meet Agassiz's standards, this sometimes took weeks, and left the students with a badly decomposed fish on their hands.[5]

Agassiz also insisted on a comparative approach. He taught that

the scientist's work consists not of enumerating facts, but of making sense of facts by putting them in relation to other facts. And he was a passionate collector. His other great contribution to Harvard, besides the modernization of its science curriculum, was the creation of the Museum of Comparative Zoology, which opened in 1860. This was a prodigy of personal fund-raising: Agassiz amazed everyone by talking the Massachusetts legislature, which had no particular reason to give money to Harvard College, into putting up one hundred thousand dollars for the museum. It became known, naturally, as "Agassiz's Museum."[6]

The methods that Agassiz championed may seem the essence of modern scientific practice. The notion that the scientist is working with actual things, rather than with prior abstract conceptions about things, suggests that the world is being taken on its own terms. The scientist is not speculating about unseen or unverifiable agencies; he or she is simply assembling reliable data and generating testable hypotheses. A personal preference for one outcome over another is not being permitted to override the evidence of the senses.

But what *is* the evidence of senses? Without concepts, it is unintelligible, and without preferences, no one would bother to accumulate it. Agassiz had concepts and he had preferences. These were not modern at all, and the manner in which he used advanced scientific practices to reach reactionary conclusions is, in retrospect, the most interesting thing about him. Despite his insistence on divorcing science from politics, Agassiz provided scientific ammunition to the politicians of his own time and well beyond it. The lesson of his career is that since everything we do we do out of some interest, we had better be clear about what our interests are. This lesson was not lost on William James.

2

After the news of the Confederate firing on Fort Sumter reached Cambridge, in April 1861, a student at the Lawrence Scientific School—Nathaniel Shaler, later a renowned Harvard geologist—found Agassiz on Divinity Avenue. He was weeping. Shaler asked

him why. "They will Mexicanize the country," was Agassiz's reply. The remark is cryptic, but it sums up, in its gnomic way, Agassiz's theory of the natural world. In order to understand what that theory was, and how it bore on the issues over which the Civil War was fought, we have to take a second look at the story of Agassiz's American career.

In the months between his arrival in Boston in October 1846 and his delivery of the Lowell Lectures that winter, Agassiz had made a quick tour of the Northeast for the purpose of introducing himself to the American scientific establishment. He ended up spending much of his time in Philadelphia, where he was in the frequent company of a man named Samuel George Morton. Morton was the most famous American anthropologist of his day. He had two medical degrees, one from the University of Pennsylvania, the other from the University of Edinburgh, and he had made his name by analyzing the fossils brought back by Lewis and Clark. His special passion, though, was human crania—skulls—which he began collecting around 1829. Morton's health was poor and he never went into the field himself, but he let it be known that he would be glad to receive skulls, and people all over the world began sending them in. By the time Agassiz paid his visit, the collection housed more than six hundred skulls and was known as "The American Golgotha."

Morton had published two major works on his skulls. *Crania Americana*, which appeared in 1839, was a study of the skulls of native Americans; *Crania Aegyptiaca*, published five years later, analyzed skulls that had been retrieved from ancient Egyptian tombs. Morton's method, like Agassiz's, was empirical and comparative. He measured the interior capacity of the skulls and then he compared the results by race. His conclusions, collated in a catalogue of the entire collection that was published in 1849 and reprinted many times, ranked the human races (as Morton classified them) by cranial capacity. In descending order of volume, these were: Caucasian, Mongolian, Malay, Native American, and Negro. Subdivisions within the five categories showed that Teutonics—Germans, English people, and Anglo-Americans—had the largest cranial capacity of all groups, and that American-born Negroes, Hottentots, and aboriginal Australians had the smallest. Morton correlated these measurements with generalizations about the attributes of the different races as he had gleaned them from anthropological and travel literature. The Caucasian race, for example, was noted to be "distinguished by the facility with which it attains the highest intellectual endowments"; the American (that is, Native American) is "averse to cultivation, and slow in acquiring knowledge; restless, revengeful, and fond of war, and wholly destitute of maritime adventure"; the Ethiopian (Negro) "is joyous, flexible, and indolent; while the many nations which compose this race present a singular diversity of intellectual character, of which the far extreme is the lowest grade of humanity."[8]

Morton's data were completely unsound. Since he possessed only the skulls and whatever information their donors chose to send along with them, he had no way of checking the reliability of his racial attributions. He failed to factor gender and overall body size—information he sometimes did not even have—into his calculations. And he dealt with skewing in his samples by making seat-of-the-pants adjustments. Some of his Caucasian skulls, for example, had belonged (as one might expect) to men who had been hanged for murder; Morton argued that the Caucasian mean should therefore be adjusted upward, on the assumption that murderers have smaller cranial capacity than law-abiding persons. He dropped Hindu skulls from his calculation of the Caucasian mean because the Hindu figure brought the overall average down, but he retained a disproportionately high number of Peruvian skulls in his calculation of the Native American mean, even though the Peruvian average was the highest within that category.[9] And he made elementary statistical errors.[10] But his studies, published in oversized volumes with elegantly engraved plates and charts, were widely circulated, and his results were cited as authoritative by scientists in the United States and Europe.

Agassiz found Morton an exceptionally congenial man; they became good friends. And he found Morton's research fascinating. Anthropology was a new field for Agassiz; his specialty, after all, was fish. His own passing remarks on the human races, back in Switzer-

land, had emphasized the unity of the species.[11] But Morton converted him. "After Georges Cuvier," wrote Agassiz's disciple and biographer Jules Marcou many years later, "Morton was the only ethnologist who had any influence on Agassiz's mind and scientific opinions. . . . He had, at last, found a naturalist to his liking, without any reserve."[12] Agassiz became a polygenist.

Two theories of racial difference predominated in Western science in the century before Darwin; neither was egalitarian.[13] People who believed that all humans are descended from a common origin (a position known as monogenism) attributed racial inequalities to differing rates of degeneration. The entire species had declined since the creation, monogenists thought, but some groups, due (usually) to the effects of climate, had declined farther than others. Polygenists, on the other hand, believed that the races were created separately and that they had been endowed with different attributes and unequal aptitudes from the start.

Polygenists rejected the degeneration theory on the grounds that archaeological evidence indicated no change in racial types over time. Their usual proof was the statues, drawings, and remains found in ancient Egyptian tombs. This is why Morton published his second volume on human skulls, *Crania Aegyptiaca*: he wanted to show that the capacity of the crania of sub-Saharan blacks found in Egyptian tombs (Morton classified Egyptians as Caucasian) was just as small relative to Caucasian crania, three thousand years ago. The depiction of blacks as servants in ancient Egyptian art, Morton argued, indicated that secondary racial characteristics had not changed either. (Since sub-Saharan blacks in ancient Egypt were people who had been captured in battle and made into slaves, it is not surprising that they were portrayed as such in Egyptian art. Polygenists did not consider this a point: "It is said that when the Negro has been with the races, he has always been a slave," one of them explained. "That is quite true; but why has he been a slave?")[14]

There will not seem, in the end, to be very much to choose between monogenism and polygenism. Both assume the existence of deeply ingrained racial differences, and both are hierarchical. But polygenism is the more radical theory, because it supports the

tention not just that black people and white people have evolved (or devolved) at different rates, but that they belong to entirely different species. And this is the view to which Samuel Morton converted Louis Agassiz.

The effect on Agassiz was visceral. In December 1846 he wrote a long letter to his mother about his American tour. The visit to Morton was the high point: "That collection alone was worth the trip to America," he told her. It was also in Philadelphia, he continued, that he had come into contact with actual Negroes for the first time in his life. "All the servants at the hotel I stayed in were men of color. I scarcely dare tell you the painful impression I received, so contrary was the sentiment they inspired in me to our ideas of the fraternity of humankind and the unique origin of our species. But," he says, "truth before all":

> As much as I try to feel pity at the sight of this degraded and degenerate race, as much as their fate fills me with compassion in thinking of them as really men, it is impossible for me to repress the feeling that they are not of the same blood as us. Seeing their black faces with their fat lips and their grimacing teeth, the wool on their heads, their bent knees, their elongated hands, their large curved fingernails, and above all the livid color of their palms, I could not turn my eyes from their face in order to tell them to keep their distance, and when they advanced that hideous hand toward my plate to serve me, I wished I could leave in order to eat a piece of bread apart rather than dine with such service. What unhappiness for the white race to have tied its existence so closely to that of the negroes in certain countries! God protect us from such contact!

Agassiz had been in the United States just two months; his observation of black people were limited to the staff of a Northern hotel. And it is surely almost instinctive, in most people, to find human beings of a kind one has never encountered before unpleasantly alien. The interesting thing about Agassiz's reaction is that he grasped immediately its political implications. The abolitionists (or "the philanthropists," as he called them) and the defenders of slavery were both

> The philanthropists who want to make them citizens of their community constantly forget that in according them political rights, they cannot give them either the African sun to favor their full development, nor a domestic hearth among them, for they would refuse them their daughters if they demanded them, and none of them would dream of marrying a negress. The defenders of slavery forget that for being black these men have as much right as we do to the enjoyment of their liberty, and they don't go into the question except as a question of property, a heritage which is protected by law and the loss of which would be their ruin.[15]

Agassiz delivered his inaugural Lowell lecture later that month and in it he announced, for the first time in his career, that although Negroes and whites belonged to the same species, they had had separate origins. Ten months later he went to South Carolina and repeated the lecture to the Charleston Literary Club at a meeting attended by local scientists and theologians eager to hear Agassiz on just this point. Pressed by his audience, Agassiz now stated that Negroes were, physiologically and anatomically, a distinct species.[16] The response was gratifying to many of his listeners, and it was promptly reported back to Morton in Philadelphia. Agassiz became a regularly invited visitor to Charleston.

Morton's skulls had made an impression. But Morton's ideas about race were also appealing to Agassiz because they were entirely consistent with his own theory of natural history. For Agassiz not only believed that every species was created separately—which was, of course, the orthodox pre-evolutionist view. He also believed that all life forms had been created in the same numbers as currently inhabit the planet, and in the same geographical locations. Nothing had changed since the creation. "Time," as he put it, "does not affect organized beings."[17]

But what about the fossil record? What about the evidence of extinct species and of ancestral versions of contemporary species? It is where the Ice Age proved a useful discovery. Agassiz believed only that God had created the world as it now exists, but that he had done so many times before. (This had also been the belief of Agassiz's mentor Cuvier.) Each previous creation had been ended by

a catastrophe, like the Ice Age, wiping out everything, and each catastrophe had been followed by a new creation, introducing superior species to the planet. Happily, the end of this process had been reached. "I think it can be shown by anatomical evidence," Agassiz wrote in what he intended as his major work, *Contributions to the Natural History of the United States of America* (1857–62), "that man is not only the last and highest among the living beings, for the present period, but that he is the last term of a series beyond which there is no material progress possible upon the plan upon which the whole animal kingdom is constructed."[18]

A theory like Morton's, according to which the different races originated in the places where they are currently found (or where the modern European first discovered them), was therefore more congenial to Agassiz than a theory in which the progeny of an original couple multiply, migrate, and mutate over time. Agassiz didn't think that plants or animals had multiplied, migrated, and mutated over time; it was awkward to have to make an exception for human beings. But he was drawn to polygenism for another reason as well: it was an idealist, rather than a materialist, theory. It made the differences we observe in the natural world the product of intelligence rather than accident.

Monogenism, the belief that all humans have a common origin, was scarcely a pure materialism. The Bible, after all, is a monogenist text: it traces all of humanity back to an original pair. But monogenism attributes the subsequent differentiation of the races to material causes, such as the effects of climate on skin color and intelligence (tropical climates being considered the most deleterious; temperate zones, such as Northern Europe, the most salubrious). On the polygenist view, all differences are attributable to the intentions of a thoughtful Creator. The races differ because they were created different. They don't just form a hierarchy; they form an *intelligible* hierarchy. They instantiate a plan.

By the time he met Morton, Agassiz was already busy with his own exegesis of this plan as he detected it in the animal kingdom—a plan that he made the subject of those first, enormously successful Lowell Lectures. Agassiz thought that the different species could

be ranked according to their degree of complexity, and that the evidence for this ranking could be found in the development of the embryo. In its earliest stage, he believed, the embryo resembles the adult version of the lowest-ranked organisms; as it develops, it passes through stages of resemblance to adult versions of higher and higher types of organisms until it attains its own level. The "higher" the organism in the scale of life forms, the greater the number of stages it passes through. "There is a period when the young bird has the structure, not only the form, but the structure, and even the fins, which characterize the Fish," Agassiz explained in a second series of Lowell Lectures, delivered in the winter of 1848–49.

> And of the young mammals the same may be said. There is a period in the structure of the young Rabbit . . . when the young Rabbit resembles so closely the Fish, that it even has gills, living in a sac full of water breathing as Fishes do. So that the resemblance is as complete as it can be, though each of these types grows to a complication of structure, by which the young Mammal, for instance, leaving behind this low organization of the lower types, rises to a complicated structure, to higher and higher degrees, and to that eminence even which characterizes mankind.[19]

The stages of embryonic development constitute, in short, "a natural scale by which we can measure and estimate the position to ascribe to any animal belonging to this family. . . . We read here the intelligent action of the Creator." And the fossil record, the testimony of all those previous creations, reveals the same progression of animal types; so that "in whatever point of view we consider the animal kingdom," embryonically or geologically, "we find its natural series agree with each other."[20]

This is the theory of recapitulation, or what is sometimes called the biogenetic law: ontogeny (the development of the individual organism) recapitulates phylogeny (the evolutionary history of the entire group). In more cosmic terms: the process by which the universe becomes itself is replicated in the life history of the individual. Agassiz did not invent this theory; he had picked it up during his education, in the 1820s, in Munich, where he had been a student of

Lorenz Oken, a cosmically minded embryologist who devised a system of classification on recapitulationist principles, and the philosopher Friedrich Schelling, who taught that all change, natural or historical, can be understood as the unfolding of an idea.[21] But Agassiz gave the theory scientific grounding by supplementing it with what his German teachers, for the most part, did not have much of: empirical data. After he left Munich, Agassiz had gone to Paris to work with Cuvier on fish fossils, and it was from Cuvier that he learned the importance of physical evidence. A man who found divine intention in the dimensions of skulls was therefore a man after his own heart.

What Agassiz took from Morton's rankings was the idea that the Negro represented the lowest stage of human being, which the Caucasian recapitulated in the course of his or her fetal development. "The brain of the Negro," Agassiz told his Charleston audience in 1847, "is that of the imperfect brain of a 7 month's infant in the womb of a White."[22] It is important to realize how deep this statement goes. For Agassiz did not mean that the brain of the Negro had evolved that way. He meant that it had been created that way. The species were immutable ("Time does not alter organized beings"): they were what Agassiz called "the living expression of a gigantic conception."[23] Nothing could alter their relations with one another. They were part of an idea.

In 1850 Agassiz returned to Charleston for a meeting of the American Association for the Advancement of Science. He delivered a paper in which he explained that although all human beings, morally speaking, enjoyed the same special relation to their Creator, "viewed zoologically, the several races of men were well marked and distinct. These races did not originate from a common centre, nor from a single pair."[24] Agassiz's remarks were welcomed by the person who had delivered the previous paper at that meeting, "An Examination of the Physical History of the Jews, in Its Bearings on the Question of the Unity of Races." This was Josiah Nott.

Nott was a physician, from a Connecticut family, who practiced in Mobile, Alabama, and who had become the leading polygenist in the South. His polygenism arose from a desire to prevent interbreed-

ing, which he believed would lead to extinction, since (he thought) hybrids—the offspring of parents of differing species—are either sterile themselves or produce sterile descendants. Nott professed to dislike slavery, but he did not profess to like black people (he expressed little concern about any form of race-mixing besides black and white), and he claimed to see no way besides slavery of preventing eugenic catastrophe. Nott's initial publications on the issue were conspicuously short on data: he relied heavily on allusions to his own experience as a physician and on ordinary prejudice.

> Look, first, upon the Caucasian female with her rose and lily skin, silky hair, Venus form, and well chiseled features—and then upon the African wench, with her black and odorous skin, woolly head and animal features—next compare their intellectual and moral qualities, and their whole anatomical structure, and say whether they do not differ as much as the swan and the goose, the horse and the ass, or the apple and pear trees,[25]

he wrote, for example, in the *American Journal of Medical Sciences* in 1843.

Morton's work gave Nott empirical ammunition. In 1844 [he] published *Two Lectures on the Natural History of the Caucasian and Negro Races* (he referred to them as his lectures on "niggerology") and embarked on a campaign to preserve the purity of the race which he believed was threatened, even in the South, by the fundamental monogenism of Christianity. Nott regarded his work at [bottom] fundamentally a crusade of science against religion, and he was delighted to welcome so renowned a scientist as Agassiz to the cause. "With Agassiz in the war," he wrote to Morton after hearing Agassiz, Charleston paper, "the battle is ours."[26]

Nott had by this time acquired a teammate, George Gliddon. Gliddon was an Englishman who, thanks to an odd confluence of circumstances, had once served as the American vice-consul in Egypt and, in that capacity, had been responsible for providing [some] Morton with most of his Egyptian specimens. *Crania Aegyptiaca* was dedicated to him. Gliddon had come to the United States in 1835 and had toured the country giving lectures on Egyptology, [including]

in 1843, a series of Lowell Lectures. After Morton died, in 1851, of the heart disease that had prevented him from leaving Philadelphia, Nott and Gliddon began the project of making Morton's research the basis for an authoritative work of racial science. Through their efforts polygenism became known as the American school of anthropology.

They cultivated Agassiz assiduously. During his visit to Charleston in 1850, Agassiz had been taken to visit some local plantations. He interviewed slaves and found, he claimed, that he could identify the African tribes to which they had belonged from their physical features, "even when they attempted to deceive him." "These races," he concluded, "must have originated where they occur. . . . Men must have originated in nations, as the bees have originated in swarms."[27] In 1853 Agassiz went to Mobile, Nott's home base, to deliver a series of lectures. Nott and Gliddon attended, and one day Agassiz told them that his next lecture was "for *you*." In it he announced that "we see in the races a gradation parallel to the gradations of animals up to man. . . . The inferior races, by successive gradations, are linked to a higher humanity. How could climatic influences produce these results? How could all physical causes combined? It would be to make accident produce a logical result; in short, an absurdity."[28]

A year later, Nott and Gliddon published *Types of Mankind*, the first of two huge tomes based on Morton's researches. The leading theme of the volume was the supremacy of the white race: the servitude of Negroes and the extinction of Native Americans were explained as the natural outcomes, scientifically confirmed, of human history.[29] Agassiz sent Nott and Gliddon an essay, which they placed, with much fanfare, at the beginning of the volume. The diversity of species, Agassiz explained, "is a fact determined by the will of the Creator, and their geographical distribution part of the general plan which unites all organized beings into one great organic conception: whence it follows that what are called human races, down to their subdivision as nations, are distinct primordial forms of the type of man. God made the Greeks in Greece. It was the last refinement of the Agassiz doctrine.

Types of Mankind was a popular book. It had wide circulation among scientists and physicians—Dr. Holmes was a subscriber—

and it went through ten editions between 1854 and 1871. Some Northerners regarded the volume as a political defense of slavery under scientific cover, and Agassiz's participation in it as ingenuous or worse. Agassiz was unmoved. "I do not regret contributing," he replied to one Northern scientist. "Nott is a man after my heart, for whose private character I have the highest regard. . . . I know him to be a man of truth and faith. Gliddon is coarse. . . . But I would rather meet a man like him . . . than any . . . who shut their eyes against evidence."[31]

And when Nott and Gliddon brought out their second volume, *Indigenous Races of the Earth*, in 1857, Agassiz again supplied some remarks expanding on his earlier theory of the separate creation of nations. Nott and Gliddon also submitted for his approval a chart assembled by Gliddon, on "The Geographical Distribution of Monkeys in Their Relation of That of Some Inferior Types of Man." It demonstrated that "the most superior types of Monkeys are found to be indigenous exactly where we encounter races of some of the most inferior types of Men." "Europe," Gliddon pointed out, ". . . has not contained any monkeys."[32] Agassiz approved.

3

Despite its obvious usefulness in defenses of slavery, polygenism was a controversial doctrine in the South because it contradicted the account in Genesis. And even proslavery polemicists like George Fitzhugh were uncomfortable with the implication that Negroes were effectively animals and could be treated as such. But as the political temperature rose, polygenism was cited in support of the view that slavery did not violate the spirit of the Declaration of Independence, on grounds that Jefferson's term "all men" did not, historically, mean blacks. "The abolition delusion is founded upon the error of using the word *man* in a generic sense, instead of restricting it to its primary specific sense," wrote Samuel Cartwright, a Louisiana physician, in *De Bow's Review*, a leading Southern journal. Cartwright popularized the work of the American school of anthropology by making polygenism compatible with Christianity. The

Bible, he explained, describes two creations, a black one (with the animals) and a white one (Adam and Eve). The Hebrew word for the serpent who tempts Eve is *Nachash*, meaning "to be or become *black*": the biblical serpent is, Cartwright was thus able to reveal, "the *negro gardner*."[33]

Agassiz himself argued that the Bible is simply silent on the question of the origin of any other race than the Caucasian: "We have no statements relating to the origin of the inhabitants now found in those parts of the world which were unknown to the ancients." And he was insistent that his views were not intended as a defense of slavery. He was a scientist, not a politician or a minister, and he was obliged to follow the evidence no matter where it led. At the same time, he was confident that "human affairs with reference to the colored races would be far more judiciously conducted, if, in our intercourse with them, we were guided by a full consciousness of the real differences existing between us and them, and to foster those dispositions that are eminently marked in them, rather than by treating them on terms of equality." Slavery seemed to him a violation of the moral status enjoyed by every human being in the eyes of the Creator, and therefore beyond the pale. The political lesson of polygenism was not that Caucasians had a right to oppress the members of other races. It was that the races had never been intended to interact at all. "For our part," he wrote in an article published a few months after the Compromise of 1850, "we have always considered it a most injudicious proceeding to attempt to force the peculiarities of the white civilization of the nineteenth century upon all nations of the world."[34]

In America, of course, the civilizations had long since intersected. Black people had been forcibly resettled in a part of the planet where God had intended only white people to live. (And, evidently, Native Americans. The presence of Native Americans in a temperate climate was an embarrassment to polygenists and monogenists alike: if God had created these people in North America, Caucasians from Europe had no business displacing them; on the other hand, if climate was a factor in the evolution of the races, the alleged disparity between Caucasian and Native American capacity was inexplicable.)

Agassiz viewed the racial confusion in the United States with grave alarm—as is already clear in the letter he sent to his mother in his first months in America. He genuinely deplored slavery—he was, after all, a Swiss republican—but he dreaded social equality among the races nearly as much.

In 1863, the year the Emancipation Proclamation went into effect, Lincoln appointed Samuel Gridley Howe to head the American Freedmen's Inquiry Commission, which was charged with formulating policies for dealing with a large freed black population. Howe wrote to Agassiz to ask whether, in his opinion as a scientist, "the African race, represented by less than two million blacks, & a little more than two million mulattoes . . . will be a *persistent* race in this country; or, will it be absorbed, diluted, & finally effaced by the white race, numbering twenty four millions."[35]

Agassiz was sufficiently stirred to write Howe four letters on the subject in less than a week. He had, it turned out, become a subscriber to the eugenic views of Josiah Nott. He believed that racial interbreeding would be a biological catastrophe, on grounds that hybrids were defective or sterile. (This had not, incidentally, been Samuel Morton's view. The supposed sterility of hybrids was a leading monogenist argument—the races manifestly do interbreed after all—and Morton preferred to concede the point by arguing that many animal species also interbreed successfully. He thought the races simply felt a natural sexual repugnance for one another.) He saw one policy to be avoided at all costs, therefore, was the policy of racial amalgamation.

Sexual intercourse between whites and blacks, Agassiz told Howe, was the moral and biological equivalent of incest. The government ought "to put every possible obstacle to the crossing of the races, and the increase of half-breeds."

> It is immoral and destructive of social equality as it creates [illegible] ral relations and multiplies the differences among members of the same community in a wrong direction. . . . [W]hile I believe that a wise social economy will foster the progress of every pure race according to its natural dispositions and abilities . . . I am convinced also that no efforts should be spared to check that which is abhorrent to our better nature, and inconsistent with the progress of higher civilization and a purer morality.

As Howe had explained, though, mulattoes actually outnumbered Negroes in the United States, a statistic not exactly compatible with the notion that racial interbreeding is instinctively repugnant and leads to extinction. Agassiz recognized the anomaly, and he had an argument ready to address it. Those mulattoes, he explained, were simply products of the abnormal conditions of a slave society.

> As soon as the sexual desires are awakening in the young men of the South, they find it easy to gratify them by the readiness with which they are met by colored house servants. . . . The first gratification under the pressure of so great a stimulus as the advantages accruing to the family negress, from the connection with young masters, already blunts his better instincts in that direction and leads him gradually to seek more "spicy partners," as I have heard the full blacks called by fast young men. Moreover it is not difficult physiologically to understand why mulattoes with their peculiar constitution should be particularly attractive physically, even though that intercourse should be abhorrent to a refined moral sensibility. Again whatever be the merit of this explanation, . . . [i]t is altogether a physical connection and in the lowest condition of life.[37]

It was possibly not the most scientific argument. The next day, in a new letter, Agassiz tried another tack. "Conceive for a moment the difference it would make in future ages for the prospect of republican institutions and our civilization generally, if instead of the manly population descended from cognate nations, the United States should hereafter be inhabited by the effeminate progeny of mixed races, half indian, half negro, sprinkled with white blood," he suggested. "In whatever proportion the amalgamation may take place, I shudder at the consequences." He advised Howe to contemplate the present condition of Latin America. "Can you devise a scheme to restore the Spaniards of Mexico from their degradation?" he asked. "Beware, therefore, of any policy which may bring our own race to their

level." It was the fear he had expressed, through his tears, to Nathaniel Shaler when the war broke out: "They will Mexicanize the country." "They" were the abolitionists.

The only way to avoid the disaster of racial intermarriage, Agassiz thought, was (given the unfeasibility of mass exportation) to deny black Americans social equality. "We ought," he advised,

> . . . to beware how we give to the blacks rights by virtue of which they may endanger the progress of the whites. . . . Social equality I deem at all times impracticable. It is a natural impossibility, flowing from the very character of the negro race. . . . [T]hey are incapable of living on a footing of social equality with the whites, in one and the same community, without becoming an element of social disorder.[38]

Howe wrote back a little shaken by the tone of Agassiz's letter. He was in favor of political equality, he explained, but that did not mean he countenanced racial amalgamation, and he was a little hurt to feel that Agassiz had assumed otherwise. He was not willing to concede that black people were inferior to whites, but he agreed with Agassiz completely about mulattoes, and he assured him that he would never recommend any policy "discordant with natural instincts and cultivated tastes." "[M]ulattoism," he affirmed, "is hybridism, and . . . is unnatural and undesirable." Those who favor amalgamation "forget that we may not do the wrong that right may come of it. They forget that no amount of diffusion will exterminate whatever exists; that a pint of ink diffused in a lake is still there, and the water is only the less pure."[39]

Howe was a physician, a philanthropist, and an abolitionist. He had served in the bodyguard of Wendell Phillips; he had been a member of John Brown's Secret Six; he was married to the author of "The Battle Hymn of the Republic." Yet he accepted, as scientific, racial myths that helped sustain a hundred years of segregation.

SIX

BRAZIL

1

WILLIAM JAMES'S FIRST ENCOUNTER with Louis Agassiz took place in September 1861, five months after the outbreak of the Civil War. James was nineteen and had just arrived at Harvard to enter the Lawrence Scientific School. Agassiz was giving another series of Lowell Lectures in Boston that fall, this one on "Methods of Study in Natural History," and James attended. "He is evidently a great favorite with his audience and feels so himself," James reported to his family, back in Newport. "But he is an admirable, earnest lecturer, clear as day and his accent is most fascinating. I should like to study under him."[1]

He did. James began at Lawrence as a student of Charles William Eliot, who would eventually become, as president of Harvard, the most important figure in the history of American higher education, but who was then a chemist of no special distinction. James's own enthusiasm for chemistry was small, and he hated laboratory work. (Though he later established the first laboratory for experimental psychology in America, the aversion was lifelong.) In his second year at

Head of Alexandrina (1865), woodcut made from a drawing by W[illegible] James, in Teffé, Brazil, at the request of Louis Agassiz. (From Louis and Elizabeth Agassiz, *A Journey in Brazil*.)

Lawrence he switched to natural history to study with Agassiz and the biologist Jeffries Wyman. In 1864 (conforming to his pattern of changing career tracks regularly) he quit the Scientific School and entered the Medical School. But he maintained an interest in zoology and anatomy, and in 1865, when Agassiz began recruiting volunteers for his trip to Brazil, James signed up.

The Brazil expedition was a classic Agassiz operation.[2] It arose out of a series of public lectures on glaciers which he gave in the winter of 1864–65. Agassiz, of course, took glaciers to be one of the techniques God employed to wipe out existing life forms in preparation for a new creation. This theory doesn't work, though, if the Ice Age is restricted to the Northern Hemisphere; it has to have been a global event. God is supposed to start each time from scratch. Agassiz therefore remarked, in his final lecture, on the desirability of exploring Brazil for evidence of glacial action in the Southern Hemisphere. Nathaniel Thayer, a wealthy businessman who was also the treasurer of the board of trustees at the Museum of Comparative Zoology ("Agassiz's Museum"), was in the audience, and he took the bait. He offered to underwrite a yearlong expedition for Agassiz, four paid assistants, and a number of students (one of whom turned out to be his own son Stephen). Samuel Ward, the American agent for Baring Brothers, arranged for the Pacific Mail Steamship Company, whose financial interests he represented, to provide free passage to Rio de Janeiro on a new ship, the *Colorado*. (Ward's son, Tom, also signed up as a student assistant; Samuel Ward was the James family banker, and Tom was one of William James's best friends.)

The services of the United States government were enlisted as well. The administration was interested in counteracting Confederate influence in Brazil (a consideration that had become irrelevant by the time the expedition arrived) and in opening the Amazon up to trade (an event that indeed took place about a year after the expedition returned, and for which Agassiz legitimately claimed some credit). The government notified its officers to give the expedition [illegible] as it required, and entrusted Agassiz with various messages for the Emperor, Dom Pedro II—who, within days of the expedition's arrival in Rio (and after a few personal visits from its leader), became

another delighted captive of Agassiz's charm. Dom Pedro, it turned out, was an amateur devotee of natural history, and he arranged for free transportation and meals, provided government steamships for river travel, appointed a major from his army to accompany the expedition, and undertook to collect certain rare fish specimens, desired by Agassiz, personally.

As was his habit, Agassiz made generosity easy by accepting everything as his due. "*Offering* your services to Agassiz," as James explained to his mother in a letter written on board the *Colorado*, "is as absurd as it wd. be for a S. Carolinian to *invite* Gen. Sherman's soldiers to partake of some refreshment when they called at his house." James had just witnessed a scene in which a passenger on the ship, a man named Frederick Billings, who was on his way to California, had offered to lend Agassiz some books. "Ag: 'May I enter your state room & take them when I shall want them, Sir?' Billings extending his arm, said genially: 'Sir, all that I have is yours!' To which, Agassiz, far from being overcome, replied, shaking a monitory finger at the foolishly generous wight: 'Look out, Sirr, dat I take not your skin!' That," wrote James, "expresses very well the man."[3]

The Thayer expedition, as it was officially known, lasted eighteen months, from April 1865 to August 1866 (although William and his friend Tom Ward went home early, in January). Scientific drawings were made, photographs were taken, and over eighty thousand specimens—an enormous haul—were collected and shipped back to Cambridge.[4] But as many people felt afterward, there was something slightly bogus about the whole enterprise. For the expedition was designed to score predetermined points. It was a mission with a mission. Agassiz intended to gather evidence that would disprove the theories of Charles Darwin; and, knowing in advance exactly what he was looking for, he found it.

2

On the Origin of Species was published on November 24, 1859. The word "evolution" barely appears in it. Many scientists by 1859 were evolutionists—that is, they believed that species had not been created once and for all, but had changed over time. The French naturalist Jean-Baptiste Lamarck had advanced his theory of progressive adaptation in *Philosophie zoologique* in 1809; the English philosopher Herbert Spencer had published his evolutionary theory of mind and behavior, *Principles of Psychology*, in 1855. Darwin's book decisively tipped the balance of educated opinion to evolutionism; but even after 1859, more nineteenth-century evolutionists were (whether they identified themselves as such or not) Lamarckians or Spencerians than Darwinians. The purpose of *On the Origin of Species* was not to introduce the concept of evolution; it was to debunk the concept of supernatural intelligence—the idea that the universe is the result of an idea.

For a belief that species evolve is not incompatible with a belief in divine creation, or with a belief in intelligent design. Progressive adaptation might simply be the mechanism God has selected to realize his intentions. What was radical about *On the Origin of Species* was not its evolutionism, but its materialism. Darwin wanted to establish something even his most loyal disciples were reluctant to admit, which is that the species—including human beings—were created by, and evolve according to, processes that are entirely natural, chance-generated, and blind. In order to do this, he had to do more than come up with a new set of scientific arguments. He had to develop what amounted to a new way of thinking.[5]

The world is filled with unique things. In order to deal with the world, though, we have to make generalizations. On what should we base our generalizations? One answer, and it seems the obvious answer, is that we should base them on the characteristics things have in common. No individual horse is completely identical to any other horse; no poem is identical to any other poem. But all things we call horses, and all things we call poems, share certain properties, and if we make those properties the basis for generalizations, we have one way of "doing things" with horses or poems—of distinguishing a horse from a zebra, for example, or of judging whether a particular poem is a good poem or a bad poem. These common properties may be visible features or they can be invisible qualities; in either case we create an idea of a "horse" or a "poem," or of "horseness" or

"poetry," by retaining the characteristics found in all horses or poems and ignoring characteristics that make one horse or poem different from another. We even out, or bracket, the variations among individuals for the sake of constructing a general type.

Darwin's fundamental insight as a biologist was that among groups of sexually reproducing organisms, the variations are much more important than the similarities. "Natural selection," his name for the mechanism of evolutionary development that he codiscovered with Alfred Russel Wallace, is the process by which individual characteristics that are more favorable to reproductive success are "chosen," because they are passed on from one generation to the next, over characteristics that are less favorable. Darwin regretted that the word "selection" suggested an intention: natural selection is a blind process, because the conditions to which the organism must adapt in order to survive are never the same. In periods of drought, when seeds are hard to find, finches that happen to have long narrow beaks, good for foraging, will be favored over finches with broad powerful beaks: more of their offspring will survive and reproduce. In periods of abundance, when seeds are large and their shells are hard, the broad-beaked finches will hold the adaptive advantage. "Fitness" is a variable, not a constant.

Darwin thought that variations do not arise because organisms need them (which is essentially what Lamarck had argued). He thought that variations occur by chance, and that chance determines their adaptive utility. In all seasons it happens that some finches are born with marginally longer and narrower beaks than others, and that children of the same parents are not all exactly the same height. In certain environmental conditions, a narrower beak may have positive or negative survival value, but in other conditions—for example, when seeds are plentiful and finches are few—it may make no difference. The "selection" of favorable characteristics is therefore neither designed nor progressive. No intelligence, divine or otherwise, determines in advance the relative value of individual variations; there is no ideal type of "finch," or essence of "finchness," toward which adaptive changes are leading.

Natural selection is a law that explains *why* changes occur in nature—because, as Darwin and Wallace both realized after reading, independently, Thomas Malthus's *Essay on the Principle of Population* (1798), if all members of a group of sexually reproducing organisms were equally well adapted, the population of the group would quickly outgrow the resources available to sustain it. Since some members of the group must die, the individuals whose slight differences give them an adaptive edge are more likely to survive. Evolution is simply the incidental by-product of material struggle, not its goal. Organisms don't struggle because they must evolve; they evolve because they must struggle. Natural selection also explains *how* changes occur in nature—by the relative reproductive success of the marginally better adapted. But natural selection does not dictate *what* those changes shall be. It is a process without mind.

A way of thinking that regards individual differences as inessential departures from a general type is therefore not well suited for dealing with the natural world. A general type is fixed, determinate, and uniform; the world Darwin described is characterized by chance, change, and difference—all the attributes general types are designed to leave out. In emphasizing the particularity of individual organisms, Darwin did not conclude that species do not exist. He only concluded that species are what they appear to be: ideas, which are provisionally useful for naming groups of interacting individuals. "I look at the term species," he wrote, "as one arbitrarily given for the sake of convenience to a set of individuals closely resembling each other. . . . It does not essentially differ from the term variety, which is given to less distinct and more fluctuating forms. The term variety, again, in comparison with mere individual differences, is also applied arbitrarily and for mere convenience sake."[6] Difference goes all the way down.

Once our attention is redirected to the individual, we need another way of making generalizations. We are no longer interested in the conformity of an individual to an ideal type; we are now interested in the relation of an individual to the other individuals with which it interacts. To generalize about groups of interacting individuals, we need to drop the language of types and essences, which is descriptive (telling us what all finches should be), and adopt the

language of statistics and probability, which is predictive (telling us what the average finch, under specified conditions, is likely to do). Relations will be more important than categories; functions, which are variable, will be more important than purposes, which are fixed in advance; transitions will be more important than boundaries; sequences will be more important than hierarchies.

Still, relational and probabilistic thinking is just another way of making generalizations. It is no less abstract than typological and prescriptive thinking. You can't see a relation any more than you can see an essence. Until well into the twentieth century, in fact, no one had ever documented a case of natural selection in action. Darwin gleaned his evidence for the inheritability of variations from domestic dog and pigeon breeding, which is intelligent selection *par excellence*. Natural selection was only a hypothesis. And since Darwin did not know the science of genetics, he was unable even to explain how characteristics get passed on. He could only claim that he had come up with a way of thinking about living things that did a better job of accounting for what we do know and what we can see than any previous scientist.

On the Origin of Species was therefore not only a challenge to Louis Agassiz's view of natural history at almost every point; it also represented a completely different method of scientific thought. Agassiz had been an opponent of evolutionary theories (or transmutation theories, as he called them) long before Darwin's book appeared. His mentor Georges Cuvier had been a colleague of Lamarck's at the Muséum National d'Histoire Naturelle, in Paris, and had flavored his own attacks on Lamarck's theory of adaptation with the special contempt collegiality breeds. Agassiz's Lowell Lectures, "The Plan of Creation in the Animal Kingdom," 1846, were explicitly a response to *Vestiges of the Natural History of Creation*, a work, published anonymously in 1844 by an English journalist named Robert Chambers, which purported to offer scientific evidence that the "higher" species had descended from "lower" ones.

Darwin himself "discovered" the law of natural selection in 1838, after reading Malthus, and he had become convinced of the mutability of species ("it is like confessing a murder," he told his cousin

Joseph Hooker)[8] by 1844. He delayed formal presentation of his ideas, in part because of the critical reaction to Chambers's book, for twenty years—and even then he was only pushed into it by the news of Wallace's independent arrival at the same theory. But he was in continual correspondence with scientists all over Europe and the United States. Everyone knew what he was working on.

One of Darwin's American correspondents was Asa Gray. Gray was a botanist who knew Agassiz well: they had met in Princeton, during Agassiz's initial American tour, and traveled together to Philadelphia, where Agassiz had his productive encounter with Samuel Morton. When the Lawrence Scientific School got under way, Gray joined the faculty, and he and Agassiz became colleagues. Gray disapproved of Agassiz's association with Nott and Gliddon, partly for political reasons, but also because Gray was a religious man, and he believed that polygenism—the theory of the separate creation of the races—contradicted Christian teaching. He also distrusted what he regarded as an element of showmanship in Agassiz's scientific style. Agassiz "has a touch of the empiric about him," he wrote to Darwin's friend Hooker in 1858, when the storm over *On the Origin of Species* was already visible on the North Atlantic horizon, "in that he is always writing and talking *ad populum*—fond of addressing himself to an incompetent tribunal."[9]

The best evidence Darwin had for his theory of natural selection was the geographical distribution of species. (This was also the principal evidence adduced by Wallace, who had studied the distribution of butterflies in the Malay archipelago.) Darwin thought that the distribution of species was consistent with the theory of common descent—the theory, that is, that the members of a species, no matter where they are found, are descendants of a single pair. In 1855 Darwin wrote to Gray asking him for information about the distribution of plants in North America; Gray responded with an article on "Statistics of the Flora of the Northern United States," published in three parts in 1856–57. Statistical analysis of the distribution of plant species in eastern Asia and North America, Gray argued, showed that many species have migrated (due to changes in climate and in the relations of the continents) from a single origin. Specimens of a

North American species, for example, can be found in Nepal. Only one of two theories, he suggested, could explain such phenomena: a theory that assumes a common origin and looks for the causes of migration, or a theory that assumes that each type of organism originated in its present locale. But the second theory, Gray said, is only an act of faith: it "leaves species no objective basis in nature, and seems to make even the ground of their limitation a matter of individual opinion"[10]—that is, it allows the naturalist simply to assert that the Nepalese plant must be a different species from its North American look-alike.

This was a direct slap at Agassiz. In 1858 and 1859 Gray published more findings supporting his theory of plant distribution and showing that examples of the same species could be found in Japan and in eastern North America; and in the winter of 1859 he and Agassiz had a debate over his findings at the American Academy of Arts and Sciences in Boston. Gray was an academic specialist and Agassiz was a celebrity accustomed to spellbinding. But Gray won the debate easily, as he would win a second debate with Agassiz a year later, following the publication of *On the Origin of Species*.

For Gray understood something Agassiz did not, which was that there were new rules for scientific argument. The problem with Agassiz's theory, Gray argued in their first debate, was "[t]hat it offers no *scientific* explanation for the present distribution of species over the globe."[11] It was a scandalous thing to say to a man who regarded himself as the walking embodiment of modern science; but Agassiz had no reply. For he could not explain *how* species came to inhabit the places where they are currently found; he could only repeat his conviction that since this is where we find them, God must have put them there. "[T]he present races of animals were originally created on the earth in about the same proportionate numbers as they are found to have at the present time, and in about the same localities as those they now occupy,"[12] was his rebuttal of Gray. It was not an argument.

Gray, of course, had not actually seen species migrate, any more than Agassiz had seen God create them. He only had his data. But by subjecting them to statistical analysis he was able to show that the

geographical distribution of plant species followed patterns consistent with evidence of glacial activity and movements of the earth's crust. Gray was thinking in terms of relations and probabilities. Agassiz, though, was still thinking in terms of types and ideas. He was unable to see how chance could be a cause of order, and he was unable to imagine order that was not the product of a mind. Agassiz called Darwin's theory, when he finally wrote about it, "a scientific mistake, untrue in its facts, unscientific in its method, and mischievous in its tendency."[13] This was not bluster, or it was not only bluster: Agassiz simply could not recognize Darwinian thinking as science.

It was perfectly possible to believe in Darwin and God at the same time in nineteenth-century Cambridge. Gray, for example, thought that Agassiz's theism and Darwin's naturalism could somehow be synthesized, and even claimed (a little bizarrely) that a theistic view of nature was implied in Darwin's book. Organic life evolved the way Darwin said it did, by the natural selection of variations, Gray thought; but there was no reason why God could not be supplying the variations.[14] Like many other nineteenth-century scientists (including Darwin's English champion Thomas Huxley), Gray had interpreted Darwin phenomenalistically: he took natural selection to be an explanation of phenomena, not an account of final causes. In Gray's view, science was only concerned with the things of experience; it left questions about ultimates, questions like whether God exists or life has a purpose, where it found them. The theory of natural selection, Gray announced, had done nothing to disturb his own "profound conviction that there is order in the universe; that order presupposes mind; design, will; and mind or will, personality."[15] But Darwin did not believe he had left questions about ultimates where he had found them, and he eventually wrote *The Variation of Plants and Animals under Domestication* (1868) to show why Gray was wrong: because nothing in the process by which organisms evolve can be explained by a theory of design.

Agassiz, on the other hand, had given himself no room for compromise. He *couldn't* separate the phenomenal from the transcendental: his entire system was tied to the belief that all observable order in nature is prima facie evidence of a supernatural intention.

The species, he insisted, were "categories of thought embodied in individual living forms," and natural history was ultimately "the analysis of the thoughts of the Creator of the Universe, as manifested in the animal and vegetable kingdoms."[16] This intransigence left him, after 1860, with very few scientific allies in Cambridge. He was reduced to relying on the support of people like Francis Bowen, the Harvard philosophy professor who had campaigned against Emerson and whose classes the young Wendell Holmes was busy disrupting, and his own patron, John A. Lowell, who reviewed (anonymously) *On the Origin of Species* in a Boston journal, the *Christian Examiner*. "[W]e hope to be excused," Lowell wrote of Darwin, "if we say that we deem his case as really a psychological curiosity."[17] Lowell was a businessman. ("[I]t is clear," wrote Darwin after seeing the review, that "he is not [a] naturalist.")[18]

It was a fairly stunning peripeteia. Agassiz was unaccustomed to life on the professional margins, and the experience became so disorienting that in 1864 he got into a quarrel with Gray on a train from New Haven and called him "no gentleman." Gray stopped speaking to him after that. The rumor in Cambridge was that Agassiz had challenged Gray to a duel.[19] By the winter of 1865, when he mentioned the possibility of looking for glacial activity in Brazil, it was clear to Agassiz's friends that it might indeed be a good idea for him to get out of town for a while.

And on March 29, 1865, the *Colorado*, with the Thayer expedition on board, set out from New York Harbor. Elizabeth Cary Agassiz was a member of the party: she was to serve as the expedition's official diarist. On April 2, a Sunday, as the ship steamed south, the passengers noticed a column of smoke on the western horizon. It was Richmond. Grant was about to enter Petersburg, and the Confederates had set their own capital on fire. It was the last battle of the Civil War.

3

From the start William James was much more interested in Agassiz than he was in glacial activity—or in any other aspect of natural history, for that matter. And he was perfectly aware of the extent to which the expedition was, in its grander ambitions, a charade. One of the passengers on board the *Colorado* was the Episcopal bishop of Pennsylvania, Alonzo Potter, who was traveling to California with his new wife, Frances. She was Potter's third wife; he was sixty-five. Potter had an ancient connection with the Jameses. Back in 1829, in his black-sheep days, Henry Senior had dropped out of college in Albany and run away to Boston, where he ended up staying for a while with the Potters. Henry was extremely taken with the then Mrs. Potter, Sarah—"what Eve might have been before the fall,"[20] as he described her at the time. He thought it a disgrace that a woman with her attractions had been obliged to take such a plebeian married name. (Sarah Potter's maiden name, as it happened, was Nott; her father was a cousin of Josiah Nott.) The bishop evidently had an interesting track record.

Agassiz's endorsement of polygenism in the 1850s had annoyed the churchmen, but his leadership in the fight against Darwinism brought them back; and though Potter was an outspoken antislavery figure—one of his sons was a general in the Union Army—he and Agassiz quickly bonded. The bishop offered weekly sermons on the trip south, and Agassiz delivered daily lectures to the ship's company, including the captain and crew, in which he rehearsed his own theories of intelligent creation and embryological recapitulation, and expanded on his reasons for going to Brazil. "I am often asked," he explained, "what is my chief aim in this expedition to South America? . . . [T]he conviction which draws me irresistibly, is that the combination of animals on this continent, where the faunae are so characteristic and so distinct from all others, will give me the means of showing that the transmutation theory is wholly without foundation in facts."[21]

The bishop backed him up. "He and Prof. furnish as good an illustration of the saying: 'You caw me & I'll caw you,' as I ever saw," James told his parents.

> Though I think Agassiz will be left a little in the debt of the worthy Bish. unless he makes it up to morrow. The Bish tells me he . . . has

> read Substance & Shadder [Henry Senior's book *Substance and Shadow*], & tho' disagreeing with the doctrine, admires the ability displayed & the very fine style. Last Sunday he preached a sermon particularly to us "savans" as the outsiders call us, and told us we must try to imitate the simple child like devotion to truth of our great leader. We must give up our pet theories of transmutation, spontaneous generation &c, and seek in nature what God has put there rather than try to put there some system wh. our imagination has devised &c &c. (Vide Agassiz passim.) The good old Prof. was melted to tears, and wepped profusely.[22]

It was a little like the Duke and the Dauphin in *Huckleberry Finn*.

But James admired Agassiz's powers of mind and will—so focused when his own seemed so fickle—and he spent much of his time in Brazil trying to distinguish the meritorious from the meretricious in his teacher's character. It was not a simple task. "Professor is a very interesting man," William wrote to his brother Henry in May from Rio. "I don't yet understand him very well. His charlatanerie is almost as great as his solid worth; and it seems of an unconscious childish kind that you can't condemn him for as you wd most people. He wishes to be too omniscient. But his personal fascination is very remarkable." "[O]f his 11 assistants," he added, "3 are absolute idiots." He meant that three knew nothing about natural history, and that one of the three was himself.

A week later, his opinion of Agassiz had shifted. "Since seeing more of Agassiz, my desire to be with him, so as to learn from him, has much diminished," he now informed Henry. "He is doubtless a man of some wonderful mental faculties, but such a politician & so self-seeking & illiberal to others that it sadly diminishes one's respect for him. Don't say anything about this outside, for heaven's sake."

But Agassiz had not achieved his position in the world by failing to cultivate people who happened to drift into his orbit, and he must have sensed that with a young man like James patronizing encouragement would be the wrong tack to take. So when James, one morning, proposed an ingenious theory about some natural phenomenon, Agassiz responded by calling him "totally uneducated." It hit a nerve—James had good reasons for feeling insecure about his

education—and he respected Agassiz for saying it. By September, the appreciative mood had returned. "I have profited a great deal by hearing Agassiz talk," William wrote to his father,

> not so much by what he says, for never did a man utter a greater amount of humbug, but by learning the way of feeling of such a vast practical engine as he is. No one sees farther into a generalisation than his own knowledge of details extends, and you have a greater feeling of weight & solidity about the movement of agassiz's mind, owing to the continual presence of this great background of special facts, than about the mind of any other man I know. He has great personal tact too, and I see that in all his talks with me he is pitching in to my loose and . . . superficial way of thinking. I have said a great deal against him wh., if repeated to strangers, wd. generate an impression that I disliked him very much. This is not at all the case so I wish you wd. repeat none of it. Now that I am more intimate with him & can talk more freely to him, I delight to be with him. I only saw his defects at first, but now his wonderful qualities throw them quite in the background. I am convinced that he is the man to do me good.[25]

James's chief assignment in Brazil, besides the mindless one of constructing barrels for the thousands of specimens to be shipped back to the Museum of Comparative Zoology in Cambridge, was to travel up selected tributaries of the Amazon, with a Brazilian guide and a few colleagues, and collect fish. It is unclear whether he reflected much on the purpose of the exercise: it was to help Agassiz establish, by collecting specimens simultaneously from up- and downriver locations, that fish do not migrate, and that God must therefore have created the species where they are found. James's fish were to be his answer to Darwin and Gray. Agassiz was also keen to collect embryos to support his theory of recapitulation—particularly alligator eggs. A study of alligator fetal development, he thought, would yield a natural classification for all the reptiles.

And of course he was searching for evidence of glaciation. When the expedition made its first trip up a Brazilian hill outside Rio, Agassiz decided that the ground under the mule path they were traveling

on was "a drift hill with numerous erratic boulders." It was, he wrote to his Harvard colleague and close friend Benjamin Peirce, "one of the happiest days of my life"; for the erratic boulders suggested geological activity of some kind. He had not, Agassiz confessed to Peirce, actually seen traces of glacial action, such as scratches and furrows a glacier might have left behind. But this just suggested that he was on the verge of discovering "a new geological agency, thus far not discussed in our geological theories"—that is, another one of God's methods for inducing catastrophe. James was on that trip; he just noted that "erratic drift" made for an extremely uncomfortable ride.[26]

Agassiz had another item on his agenda, though, which he does not seem to have expanded on in his shipboard lectures, and which James apparently learned about by accident. One of the assistants on the expedition was a photographer, Walter Hunnewell, a man James grew friendly with, and in November Hunnewell and Agassiz set up a photographic studio in Manáos, their base of operations for exploring the upper Amazon. One day James dropped by. "I . . . was cautiously admitted by Hunnewell with his black hands," he wrote in his diary

> On entering the room found Prof. engaged in cajoling 3 mossos [*môças*: young women] whom he called pure indians but who I thought, & as afterwards appeared, had white blood. They were very nicely dressed in white muslin & jewelry with flowers in their hair & an excellent smell of pripioca. Apparently refined, at all events not sluttish, they consented to the utmost liberties being taken with them and two without much trouble were induced to strip and pose naked. While we were there Sr. Tavares Bastos [a Brazilian official who occasionally accompanied the expedition] came in and asked me mockingly if I was attached to the Bureau d'Anthropologie.

The scene was embarrassing because Agassiz had a reputation for a certain libidinal gusto. "[H]e has the joy of animal vigour in a degree rare among men," as his fellow Saturday Clubber James Russell Lowell once put it, "—a true male, in all its meaning."[28] A few years after his arrival in Boston Agassiz had been involved in a scandal concerning his relations with a servant named Jane; a witness claimed

he had discovered Agassiz and Jane in a room together with the front of Agassiz's trousers in disarray; Jane is supposed to have explained that she had been sewing on a button. (The accusation was part of a complaint brought against Agassiz by an embittered associate; the charges were investigated with due solemnity by a panel of Boston dignitaries—including John A. Lowell, who already had a good deal invested in Agassiz—and were dismissed.)[29]

It's plain that James was not impressed with the scientific rigor of the session he had barged in on, but whatever other interests they may have served (Mrs. Agassiz was, after all, traveling with the expedition), the photographs did have a scientific rationale. Agassiz was trying to do with pictures what Morton had done with skulls: he was attempting to document the hierarchy of racial types and the deterioration of mixed-race populations. It was indeed anthropological fieldwork—though Senhor Bastos's sarcastic remark suggests that this was one aspect of the expedition Agassiz had not cleared with the emperor.

And with good reason, for race was a contentious issue in Brazil in 1865. Brazil was by then the only independent state in the Western world that officially tolerated slavery. (Spain still permitted slavery in its Caribbean colonies; the United States, of course, had issued the Emancipation Proclamation in 1863, and ratified the Thirteenth Amendment, outlawing slavery, in 1865.) The government of Dom Pedro II had ended the slave trade in 1850, but until then three million Africans had been imported from Angola and the Congo. Brazil was under international pressure, particularly from Great Britain, to abolish slavery; but it was also fighting the so-called War of the Triple Alliance, against Paraguay, and the government was reluctant to deal with the domestic turmoil abolition would entail. For Brazil was an agricultural economy with a complex caste system based on race, religion, and country of birth. Still, manumission was contemplated, and Brazilian politicians were immersed in the details. Bastos, in fact, was a historian and statistician of the slave trade—which is why he would have had a particular interest in Agassiz's photographic opportunity.

After the slave trade was outlawed, there were some attempts to

import Chinese into Brazil for labor, but these were resisted on grounds that Chinese blood would corrupt Brazil's racial stock. (Portuguese from the Azores were impressed instead.) The fear of racial impurity was peculiar in a country where more people were of mixed race than were either white or black. According to its first national census, in 1872, Brazil had just under 10 million inhabitants; fewer than 3.8 million of them were classified as white, about 2 million were black, and the rest—just under 4.2 million, or 42 percent of the population—were mestizos (of mixed white and Indian ancestry) or mulattoes. Mestizos, in fact, were the dominant caste socially, outnumbering the slaveowners (of Portuguese descent) and the slaves (of African descent), and they tended to determine the mores of race-mixing.[30] Their numbers and social position did not suggest declining fertility rates among "hybrids"—but that was what Agassiz was looking for. He was seeking to reinforce the polygenetic theories of the American school of anthropology, of which he was by now the leading light, and to back up, with more science, the case against racial amalgamation he had made to Samuel Gridley Howe.

The human variety on display in Brazil fascinated both the Agassizes. "Perhaps nowhere in the world can the blending of types among men be studied so fully as in the Amazons, where mamelucos, cafuzos, mulattoes, cabocos, negroes, and whites are mingled in a confusion that seems at first inextricable,"[31] Elizabeth Agassiz wrote in her diary. Perhaps the racial mixture seemed inextricable because it *was* inextricable; but the Agassizes were conditioned to look for types, and types is what they found. On April 23, a few days after the expedition arrived, Elizabeth attended a festival to watch the negroes dance. "Looking at their half-naked figures and unintelligent faces," she wrote, "the question arose, so constantly suggested when we come in contact with the race, 'What will they do with this great gift of freedom?' The only corrective for the half doubt is to contrast the whites side by side with them: whatever one may think of the condition of slavery for the blacks, there can be no question as to its evil effects on their masters."[32] It was a distinctly Bostonian kind of racism—revulsion at the racism of others.

Elizabeth Agassiz's diary is filled with her observations of racial characteristics, including the characteristics of Brazilian whites, whom she and her husband considered triply degraded—by their southern European and Catholic origins, by their fraternization with Indians, and by their role in a slave economy. On July 30, as the expedition traveled by ship to Pará at the mouth of the Amazon, James, Hunnewell, and the Agassizes had a long moonlight conversation on deck with a Brazilian senator, a Senhor Sinimbu, about the consequences of emancipation for Brazil. "The absence of all restraint upon the free blacks, the fact that they are eligible to office, and that all professional careers are open to them, without prejudice on the ground of color, enables one to form some opinion as to their ability and capacity for development," Elizabeth Agassiz reported. "Mr. Sinimbu tells us that here the result is on the whole in their favor; he says that the free blacks compare well in intelligence. . . . But it must be remembered, in making the comparison with reference to our own country, that here they are brought into contact with a less energetic and powerful race than the Anglo-Saxon."[33] She was referring to the Portuguese.

In September, when the expedition was quartered in Teffé, Elizabeth Agassiz acquired a young housemaid, named Alexandrina, who was a cafuzo—a child of Negro and Indian parents. "She promises very well, and seems to have the intelligence of the Indian with the greater pliability of the negro,"[34] Elizabeth wrote. The Agassizes were intrigued by Alexandrina's appearance, and got James—who, after all, had once studied to be a painter—to draw her. "She consented yesterday, after a good deal of coy demur, to have her portrait taken," wrote Elizabeth.

> Mr. Agassiz wanted it especially on account of her extraordinary hair, which, though it has lost its compact negro crinkle, and acquired something of the length and texture of the Indian hair, retains, nevertheless, a sort of wiry elasticity, so that, when combed out, it stands off from her head in all directions as if electrified. In the examples of negro and Indian half-breeds we have seen, the negro type seems the first to yield, as if the more facile disposition of the negro,

as compared with the enduring tenacity of the Indian, showed itself in their physical as well as their mental characteristics.[35]

They found hierarchy in hair.

In his letters home James had complimentary things to say about Elizabeth Agassiz, though in his diary he calls her an "excellent but infatuated woman [who] *will* look at every thing in such an unnatural & romantic light that she don't seem to walk upon the solid earth."[36] James's own very casual observations tend to stress the ordinariness underneath the exotic appearance of the Brazilians he meets. "About sunrise," he writes, for example, in his diary about one of his upriver expeditions,

> we met a large montaria coming up close to the bank manned entirely by indian women 7 in all. The patroness a little old lady sat at the mouth of the toldo smoking her pipe. As we met we hailed her and stopped together. Altho' they spoke portuguese I could not make out whether all their men had gone to the war [against Paraguay] or whether they had stayed back for fear of being sent to the war. How can a population with such habits and aims as this care for the war or wish to enter the army? I marvelled, as I always do, at the quiet urbane polite tone of the conversation between my friends [the Indians in his boat] and the old lady. Is it race or is it circumstance that makes these people so refined and well bred? No gentleman of Europe has better manners and yet these are peasants.[37]

"Is it race or is it circumstance"? It is the beginning of relativistic thinking.

About the expedition as a whole James's feelings performed the usual somersaults. He was susceptible to seasickness, and he found the voyage out unpleasant and tedious. ("We have seen a few flying fish skip," he writes his parents from the *Colorado*, "but they are not near as interesting as toads at home. . . . The Ocean is a d——d wet, disagreeable place anyhow, is my conclusion.") But as soon as he gets to Rio, though, he is enraptured by the tropical landscape, and his letters are filled with enthusiasm. A month later the landscape and the climate have become unbearably monotonous

and he regrets the entire business. "My coming," he writes to his father from Rio, "was a mistake."[39] Once the group moves outside Rio, he is reenchanted. "[N]ow that the real enjoyment of the expedition is beginning & I am tasting the sweets of these lovely forests here, I find it impossible to tear myself away,"[40] he writes to his mother in August from somewhere on the Xingu River.

In the end, though, James found the experience uninspiring, including his own performance. He was (as he realized very quickly) not a dedicated collector, or even a competent one; and he hated mosquitoes. But mostly he was bored. He developed an antipathy to the repetitiveness of the work and the languidness of the environment. "I am on the whole very glad this thing is winding up," he told his mother in December, after he had made his plans to return to Cambridge,

> —not that I have not enjoyed parts of it intensely and regard it as one of the best spent portions of my life; but enough is as good as a feast; I thoroughly *hate* collecting, and long to be back to books, studies &c after this elementary existence. . . . [T]he idea of the people swarming about as they do at home, killing themselves with thinking about things that have no connexion with their merely external circumstances, studying themselves into fevers, going mad about religion, philosophy, love & sich, breathing perpetual heated gas & excitement, turning night into day, seems almost incredible and imaginary. . . . Still more remarkable seems the extraordinary variety of character that results from it all—here all is so monotonous, in life and in nature that you are rocked into a kind of sleep.[41]

He had evidently missed something he had once hoped to find—to have set out with an expectation of dangers much more interesting than mosquito bites, adventures that might call out qualities of fortitude and boldness in himself. It seems that Brazil was to be, in effect, his Civil War. In his letters he identifies Agassiz, more than once, with General Sherman, and himself with his brothers who had fought. "I have felt more sympathy with Bob and Wilk than ever from the fact of my isolated circumstances being more like theirs than the life I have led hitherto," he tells his parents on the way down. "Please read them this letter. It is written as much for them as for any

one."[42] He even suffered a sort of wound. Soon after the expedition arrived, he came down with a form of smallpox, probably varioloid, and spent two and a half weeks in a *maison de santé*. The disease left his face, in the end, unscarred, but it ruined his eyes. He had to wear dark glasses for part of the trip, and he suffered from chronic eye trouble for the rest of his life.

James had set off as if to the front, but he found no opportunity or found he could make no opportunity, for heroism. After eight months, he seems to have decided that the war was really back in Cambridge, as his last letter home suggests—"the people swarming about as they do . . . killing themselves with thinking . . . breathing perpetual heated gas & excitement." He could not know that for soldiers war is mostly boredom, too.

Almost as soon as Agassiz returned, in August 1866, he went to Washington and gave a series of lectures on "Traces of Glaciers under the Tropics" at the National Academy of Sciences, which he closed with the remark: "So here is the end of the Darwinian theory."[43] He had already had a pamphlet on "The Geology of the Amazons" printed up; Charles Lyell, the English geologist who, long before, had once secured the Lowell Lectureship for Agassiz, sent Darwin a copy. "I was very glad to read it," Darwin replied, "though chiefly as a psychological curiosity. I quite follow you in thinking Agassiz glacier-mad."[44]

And Lyell himself was not yet fully converted to Darwinism. By his inflexibility and his refusal to acknowledge the research of others (Alfred Wallace, the codiscoverer of natural selection, had been to Brazil already and had detected no signs of glaciation there), Agassiz had lost most of his scientific audience. His response was to turn his wife's diary, with considerable annotation by himself, into a book. This appeared in January 1868 as *A Journey in Brazil*. Agassiz was moving his personal battle against Darwinism onto less challenging terrain. *A Journey in Brazil*, a kind of travelogue with scientific pretensions, was designed to reach over (or under) the heads of the scientists. The Agassizes sent it as a Christmas present to their literary friends, some of whom were a little puzzled how to respond. "I must tell Mr. Agassiz there is not a word too much of science in it for

ception, though of course *I* do not understand it," wrote George Ticknor's wife, Anna. "What a beautiful book it is, so handsomely and accurately printed."[45]

Anna Ticknor was an intelligent person. Possibly there were things about the book she chose not to understand too quickly. What Agassiz was eager to show, of course, was that he had found nothing in Brazil either to support Darwin's theories or to contradict his own. But he also wished, even more fervently, to impress his audience with the dangers of racial amalgamation. Brazil was a warning. "Let any one who doubts the evil of this mixture of races, and is inclined, from a mistaken philanthropy, to break down all barriers between them, come to Brazil," he wrote in one of his lengthy footnotes to his wife's diary.

> At a time when the new social status of the negro is a subject of vital importance in our statesmanship, we should profit by the experience of a country where, though slavery exists, there is far more liberality toward the free negro than he has ever enjoyed in the United States. Let us learn the double lesson: open all the advantages of education to the negro, and give him every chance of success which culture gives to the man who knows how to use it; but respect the laws of nature, and let all our dealings with the black man tend to preserve, as far as possible, the distinctness of his national characteristics, and the integrity of our own.[46]

His ethnographic observations, photographically aided, had confirmed the polygenist view:

> I am satisfied that, unless it can be shown that the differences between the Indian, negro, and white races are unstable and transient, it is not in keeping with the facts to affirm a community of origin for all the varieties of the human family, nor in keeping with scientific principles to make a difference between human races and animal species in a systematic point of view. . . . The natural result of an uninterrupted contact of half-breeds with one another is a class of men in which pure type fades away as completely as do all the good qualities, physical and moral, of the primitive races, engendering a mongrel crowd as repulsive as the mongrel dogs, which are apt to be

> their companions, and among which it is impossible to pick out a single specimen retaining the intelligence, the nobility, or the affectionateness of nature which makes the dog of pure type the favorite companion of civilized man.[47]

And he added an appendix on the "Permanence of Characteristics in Different Human Species," in which he summarized the results of his and Hunnewell's work. It is an imitation of the racial typology of Morton's *Crania Americana*: "while the Indian female is remarkable for her masculine build, the Negro male is equally so for his feminine aspect"; the mulatto's "features are handsome, his complexion clear, and his character confiding, but indolent"; the "Mammeluco [mestizo] . . . is pallid, effeminate, feeble, lazy, and rather obstinate"; and so on.[48] Between 1868 and 1875 *A Journey in Brazil* was reprinted nine times.

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"He was a Darwinian for fun," wrote Henry Adams about Henry Adams in *The Education of Henry Adams*. He meant that he had, as a young man, regarded the theory of natural selection as unproved, and probably unprovable, but had accepted it anyway. Two of the most striking things about the reception of Darwin's theory are the degree to which it was regarded, even by its supporters, as highly speculative, and the speed with which it was nevertheless assimilated by younger intellectuals. "One could not stop to chase doubts as though they were rabbits," as Adams explained. "One had no time to paint the surface of Law, even though it were cracked and rotten. For the young men whose lives were cast in the generation between 1867 and 1900, Law should be Evolution."[49] Darwinism dropped into a cultural configuration already aligned to accommodate it. Its fitness was generally appreciated before its rightness was generally established.

William James, Adams's friend and contemporary, was also quick to respond to Darwin's ideas. The first two articles he ever published, written in 1865, just before he left for Brazil, were reviews, largely sympathetic, of works by Thomas Huxley and Alfred Wallace. James

was clearly already an evolutionist. "[I]n the case of Darwin's original law," he wrote in the Wallace review, "what most astonishes the reader is the fact that the discovery was made so late."[50] "He was a Darwinist before the letter,"[51] is the way Adams described himself at the same point in his own life.

But James differed from Adams, and from most of the rest of his generation, in his relation to Darwin. James's thought, as a psychologist and later on as a philosopher, belongs to the tradition initiated by *On the Origin of Species*; but he refused to regard evolution as a "law," in Adams's sense, and he devoted much of his life to attacking the way Darwin's work was interpreted by people like Huxley and Herbert Spencer. James had the same attitude about Darwin that he had, toward the end of his life, about Freud: he liked the ideas but hated seeing them treated as the exclusive truth. He was Darwinian, but he was not a Darwinist. This made him truer to Darwin than most nineteenth-century evolutionists.

On James's view, two incorrect lessons were drawn from the success of *On the Origin of Species*. The first was the conclusion that science is an activity that is properly independent of our own (or our society's) interests and preferences. Darwin's book had, of course, scandalized the faithful; one way to defend it was to explain that the scientist can only stick to the facts. But for James, anti-Darwinian scientists like Agassiz were mistaken not because they ignored the facts in favor of preconceived theories, but for the opposite reason—because they collected facts without a working hypothesis to guide them. When we look at Agassiz's work we think we are seeing a confusion between science and belief. But what we are really seeing is a disjunction between those things. This is what Asa Gray had meant when he said that Agassiz had no *scientific* explanation for the phenomena he observed; for Agassiz had only his observations on one side and his theory on the other. His science wasn't theoretical and his theory wasn't scientific. His ideas are edifices perched on top of mountains of data. Darwin's ideas are devices for generating data. Darwin's theory opens possibilities for inquiry; Agassiz's closes them.

In 1868 James was in Germany, where he spent a year that turned out to be even less inspiring than his eight months in Brazil; he was

trying to study physiology, but a bad back and low spirits drove him to a spa, in Bohemia, where he spent most of his time reading Goethe. But when Darwin's book on *The Variation of Animals and Plants under Domestication* came out that winter, James wrote two reviews of it, one for the *North American Review* (whose editor, Charles Eliot Norton, was a good friend of his brother Henry) and the other for the *Atlantic Monthly* (whose assistant editor, William Dean Howells, was also a good friend of his brother Henry). Darwin's book introduced nearly as many difficulties as it solved, James wrote: "the only 'law' under which the greater mass of the facts the author has brought together can be grouped seems to be that of Caprice,—caprice in inheriting, caprice in transmitting, caprice everywhere, in turn. To look for laws at all in the chaos seems absurdly presumptuous."

But James thought that this was what made the work profound. For it is in the nature of experience to offer exceptions and eccentricities, and a theory that anticipates them—that is, in fact, predicated on them—is far more useful than a theory that bulldozes them. "It is one of the fortunate points of the general theory which bears [Darwin's] name (and which is, after all, only a descriptive or historical, and not a physiological hypothesis)," James pointed out, "that the more idiosyncracies are found, the more the probabilities in its favor grow [since idiosyncrasies are evidence of chance variation]. Its adversaries are those whose interest it is to establish the rigor of their descriptive laws. . . . Hence, the great value of the hypotheses in setting naturalists to work, and sharpening their eyes for new facts and relations."[52] One of the adversaries James had in mind, of course, was Agassiz. "The more I think of Darwin's ideas," he wrote to Henry while he was working on his reviews, "the more weighty do they appear to me—tho' of course my opinion is worth very little—still I believe that that scoundrel Aggassiz is unworthy either intellectually or morally for him to wipe his shoes on, & I find a certain pleasure in yielding to the feeling."[53]

The other wrong lesson James thought people took from *On the Origin of Species* is, in effect, the flip side of the first. It is the belief that evolutionary science can lay a foundation for norms—that

ral selection serves as a kind of "bottom-line" arbiter of merit. This is the doctrine of "the survival of the fittest," a concept that originated not with Darwin, but with Herbert Spencer, seven years before *On the Origin of Species* appeared.[54] It makes the logic of evolution the logic of human values: it suggests that we should pursue policies and honor behavior that are consistent with the survival of characteristics understood to be "adaptive," and it justifies, as "natural," certain kinds of coercion. In a society that had just been through a civil war the appeal of Darwin's theory, on this interpretation, is plain—as Adams, in his mordant way, recognized. Adams had spent the Civil War years in London, serving as secretary to his father, Charles Francis Adams, who was Lincoln's minister to the Court of St. James's; evolution, he wrote in the *Education*, was the perfect theory for a "young man who had just helped to waste five or ten thousand million dollars and a million lives, more or less, to enforce unity and uniformity on people who objected to it."[55] The war was just part of the struggle for existence, a means by which the species moved ahead.

James believed that scientific inquiry, like any other form of inquiry, is an activity inspired and informed by our tastes, values, and hopes. But this does not, in his view, confer any special authority on the conclusions it reaches. On the contrary: it obligates us to regard those conclusions as provisional and partial, since it was for provisional and partial reasons that we undertook to find them. A theory good for explaining why finches have differently sized beaks in different environments has no further necessary claim on us—and maybe we will come up with a better explanation for finch beaks someday, too. The mistake is not simply endowing science with an authority it does not merit. It is turning one belief into a trump card over alternative beliefs. It is ruling out the possibility of other ways of considering the case. That there is always more than one way of considering a case is what James meant by the term (which he introduced to English-language philosophy) "pluralism."

For when circumstances change, trumps have a tendency to change as well. Even in his brief career as a naturalist James had had a chance to see how malleable an authority science can be. For twenty years Agassiz and Nott had insisted that the races must be

segregated because science had determined them to be separately created species. But in 1866, after Darwin had persuaded most scientists of the theory of common descent, Nott published a book called *The Negro Race: Its Ethnology and History* in which he coolly conceded that Darwin might perfectly well be correct, but that since the theory of natural selection required millions of years for the races to differentiate, the practical effect was the same: Caucasian superiority, Negro inferiority.[56] Two years later, in *A Journey in Brazil*, and with equal aplomb, Agassiz abandoned the theory of multiple human origins on which he had based his opinions about racial policy—though he did not abandon the opinions. "[F]or my purpose, it does not matter whether there are three, four, five, or twenty human races, and whether they originated independently from one another or not," he now explained. "The fact that they differ by constant permanent features is in itself sufficient to justify a comparison between the human races and animal species."[57] Both men were anticipated by Samuel Morton himself. Alexander von Humboldt, Agassiz's old mentor, had attacked Morton's polygenist ethnology in his major work, *Cosmos* (1849), and had maintained the unity of the human species. Morton wasn't bothered a bit. "[I]t makes little difference," he replied, "whether the mental inferiority of the Negro, the Hottentoyede, or the Indian, is natural or acquired; for, if they ever possessed equal intelligence with the Caucasian, they have lost it; and if they never had it, they had nothing to lose."[58] So much for the evidence of the tombs.

James was alert to this use and abuse of science. In 1868, around the same time he was reviewing *The Variation of Animals and Plants under Domestication*, he also reviewed a report on the state of anthropology in France by Armand de Quatrefages. Quatrefages (as James called him in one of his letters home to Henry, "Quatrefages [is] a prominent French monogenist. Anthropology had become a subject of great popular interest, James noted in his review, but

> [m]uch of this popular interest has anything but a purely scientific source. The zeal for and against orthodoxy has always formed a by no means insignificant factor in the popularity of the question of the

> original unity ("Monogenism") or diversity ("Polygenism") of our species, and we in America all know too well how often "science" has been appealed to in the least calm of public assemblies to bear evidence in favor of one view or another of the way in which we ought to treat the inferior races that live with us.[60]

The passage suggests two things: that James was comfortable with a hierarchical conception of race ("the inferior races who live with us"), and that he was doubtful that science had much to do with people's opinions about it.

And if we try to assign a role to scientific and religious beliefs in the politics of slavery, we find that nothing like a pattern emerges. Polygenism would seem the natural scientific theory for a supporter of slavery to hold, but most Southerners who had an opinion on the subject were monogenists. Some Americans felt compelled by their Christian faith to demand the abolition of slavery; some felt compelled by it to defend slavery to the death. There were atheists, like Wendell Holmes, who opposed slavery and there were atheists, like Josiah Nott, who defended it. Samuel Morton was a Philadelphia Quaker; so was Penrose Hallowell. Theodore Parker believed that people with dark skin were inferior; Wendell Phillips believed that all men were created equal. Both risked their lives to free the slaves. The Episcopal bishop of Vermont got into a heated dispute with the Episcopal bishop of Pennsylvania (Alonzo Potter, Agassiz's shipboard crony) over whether the Bible countenanced slavery (Potter thought it did not).[61] Scientific and religious beliefs are important to people; but they are (usually) neither foundational premises, backing one outcome in advance against all others, nor ex post facto rationalizations, disguising personal preferences in the language of impersonal authority. They are only tools for decision making, one of the pieces people try to bundle together with other pieces, like moral teachings and selfish interests and specific information, when they need to reach a decision.

James believed that the theory of natural selection should be regarded like any other idea—as a hypothesis, good in some situations, not so good in others, and not as a basis for values. Natural selection

is, after all, a chance process. The finch with the better-adapted beak isn't smarter or nobler than the other finches; it just lucked out. A characteristic that helps an organism survive may be completely undesirable from every other point of view, and survival in one season can mean extinction in the next. The real lesson of *On the Origin of Species* for James—the lesson on which he based his own major work, *The Principles of Psychology* (1890)—was that natural selection has produced, in human beings, organisms gifted with the capacity to make choices incompatible with "the survival of the fittest." There *is* intelligence in the universe: it is ours. It was our good luck that, somewhere along the way, we acquired minds. They released us from the prison of biology.

James's understanding of the Civil War was different, therefore, from Adams's: it had another layer, so to speak. If the war is seen simply as an elemental struggle for existence between two groups, nothing about it deserves either credit or discredit—any more than the surviving finches deserve credit for the shape of their beaks. But if it is seen as the sum of many individual actions, the war was an event bristling with moral significance; for everything human beings do by intelligence rather than instinct, any course of conduct they choose when they might have chosen differently, is a moral action.

The wounds Wilky James suffered in the failed assault of the Fifty-Fourth Massachusetts on Fort Wagner, in the summer of 1863, were severe; he was unconscious when he was brought, all the way from South Carolina, into the Jameses' house in Newport, and it took him a year and a half to recover. He then rejoined his regiment and served until the end of the war. In 1866 he and his brother Bob started a farm in Florida using freed blacks as labor, but the racism of local whites and the falling price of cotton brought the enterprise to a disastrous end. Bob bailed out early; Wilky stayed on for six years, long enough to see that the emancipation for which he had fought had only brought a new kind of misery to black people in the South.

He finally moved to Milwaukee and got a job as a clerk for the railroad, but he became too crippled by kidney problems, a weak heart, rheumatism, and the lingering effects of his wounds to work.

In 1882 Henry James, Sr., died, leaving a will from which (in a bizarre reversion to the behavior of his own father fifty years earlier) he excluded Wilky, on grounds that Wilky had used up his share of the inheritance on the Florida venture. He also reduced the bequest to Bob. Wilky called it "a death stab at the only two of his children who dared fight through the war for the defense of the family."[62] A year later, he died of kidney disease. He was thirty-eight. As a boy, he had been considered the most affable and gregarious of all the James children.

In 1897 the Commonwealth of Massachusetts erected a monument on Boston Common, designed by Augustus Saint-Gaudens and dedicated to Robert Gould Shaw, the man who had led the Fifty-Fourth and had died at Fort Wagner. William James was invited to deliver the oration at the unveiling. It is the finest of his speeches. Shaw had begun the war as a private in the Seventh New York Regiment, and was then commissioned an officer in the Second Massachusetts before accepting, in the winter of 1863, the colonelcy of the Fifty-Fourth, the so-called black regiment. Veterans of all Shaw's regiments were in the audience when James spoke. Shaw was being honored for having been a valiant soldier, James told them, but that was not what made him worthy of a memorial. For the instinct to fight is bred into us through natural selection; it hardly needs monuments or speeches to be reinforced. "[T]he survivors of one successful massacre after another are the beings from whose loins we and all our contemporary races spring," James said; ". . . pugnacity is the virtue least in need of reinforcement by reflection."

What had made Shaw admirable, James explained, was not "the common and gregarious courage" of going off to fight.

> It is that more lonely courage which he showed when he dropped his warm commission in the glorious Second to head your dubious fortunes, negroes of the Fifty-fourth. That lonely kind of courage (civic courage as we call it in peace-times) is the kind of valor to which the monuments of nations should most of all be reared, for the survival of the fittest has not bred it into the bone of human be-

> ings as it has bred military valor; and of five hundred of us who could storm a battery side by side with others, perhaps not one could be found who would risk his worldly fortunes all alone in resisting an enthroned abuse.

A great nation is not saved by wars, James said; it is saved "by acts without external picturesqueness; by speaking, writing, voting reasonably; by smiting corruption swiftly; by good temper between parties; by the people knowing true men when they see them, and preferring them as leaders to rabid partisans or empty quacks."[63] This is the behavior that monuments should honor.

Shaw was a war hero. He had been shot through the heart on the ramparts of a Confederate fort, about as glorious a death as any soldier's in the Union Army. Saint-Gaudens's monument was Boston's tribute to what it regarded as its own best character, to its fittest. In the minds of everyone listening to James's speech, Shaw was a paragon of breeding. He was the very type of the heroic Brahmin. It was a little perverse, in those circumstances, for James to speak of Shaw's courage as "lonely" or his actions as unpicturesque. But William James was not a Brahmin, and he was not thinking about Robert Shaw. He was thinking about Wilky.