PROCEEDINGS OF THE CALIFORNIA ACADEMY OF SCIENCES

Volume 55, Supplement II, No. 10, pp. 138–145, 1 figs., 3 tables. November 19, 2004

Travel as a Predictor of Scientific Innovation: The Corroborating Case of George G. Simpson

Léo F. Laporte
Department of Earth Sciences, University of California, Santa Cruz
Santa Cruz, California 95064; E-mail: laporte@ucsc.edu

In "Born to Rebel" (1996) Frank Sulloway argues that laterborn children are especially "open to experience" and thus more likely to become innovators, if not revolutionaries, as contrasted with firstborn siblings. One significant predictor of such openness is the proclivity for world travel. Sulloway's claim is tested in the particular case of the innovative American paleontologist and evolutionist George G. Simpson (1902–1984).

Simpson, who was one of several founders of the "modern evolutionary synthesis" in the 1940s, traveled far and wide throughout his long life, often at considerable personal risk. The youngest (and first son) of three children, Simpson learned International Morse Code as a teenager and obtained a 2nd-class radio operator's license in the hope of sailing to South America. Instead, on a year's leave from college he tramped his way from Chicago to New Orleans. Thereafter, Simpson traveled the six continents and seven seas "because the world is indeed so full of… interesting things." Some of Simpson's best popular writing is travel-related, including "Attending Marvels" (1934) a journal of his first paleontological expedition to Patagonia.

Ironically, it was travel that was almost Simpson's undoing, for he suffered a near fatal accident fossil-collecting in the headwaters of the Amazon. While this resulted in a major setback to his professional career, it did not lessen his enthusiasm for continued world travel, if only then as a sight-seeing tourist.

Background

In his book, *Born to Rebel: Birth Order, Family Dynamics, and Creative Lives*, the Darwin scholar and Freud biographer, Frank Sulloway, makes the claim that "most individual differences in personality . . . arise *within* the family. The question why some people rebel, including why a few particularly far-sighted individuals initiate radical revolutions, is synonymous with the question why siblings are so different . . . . [Siblings employ different] strategies . . . aimed at maximizing parental investment" (1997:xiii, xv; emphasis in the original). Sulloway's thesis is based upon 25 years of study of the biographical circumstances of some 6000 lives in Western history, centered around the Darwinian Revolution, the Protestant Reformation, the French Revolution, 28 innovations in science, and 23 liberal scientific theories. Sulloway, however, is careful to insist that his line of reasoning be meant to be understood as probabilistic only, and not at all deterministic. For example, his research also shows that strong parental conflict between parent and firstborns usually yields quite different, even opposite outcomes.[1]

[1] For weak and strong criticism of Sulloway's thesis, see respectively, John Modell, "Family Niche and Intellectual Bent," 1997, *Science*, vol. 275, p. 624–625, and Judith Ruth Harris, 1998, *The Nature Assumption,* p. 365 ff.

Upon reading *Born to Rebel,* I was immediately intrigued to see if his thesis was borne out by the specific instance of the scientifically innovative American paleontologist and evolutionist, George G. Simpson (1902–1984), whose own life history I am familiar with (e.g., Laporte 2000). While fully realizing that a corroborating instance by no means proves an hypothesis, nevertheless the Simpson example does indeed support Sulloway's claim, which this essay intends to demonstrate.

Sulloway's Argument

According to the Darwinian principle of divergence, a useful strategy for organisms is to differ from one another given the inevitable scarcity of resources — especially food, space, and mates. Furthermore, because two species with the exact ecological requirements cannot coexist in the same habitat, they undergo character displacement, thereby reducing their competitive interaction. Sulloway applies this Darwinian reasoning to human families where siblings compete for scarce parental resources, with each new sibling seeking out an unoccupied niche in the family. Firstborn offspring use their superior size and strength to protect their status against claims from laterborns who then are inclined to question the status quo and therefore often tend to be more rebellious, even revolutionary (1997:85–86).

It further follows, according to Sulloway, that owing to their rebellious tendencies, laterborns are especially open to experience, because it helps them locate an unoccupied niche in the family. This openness to experience often shows up as risk-taking, one good measure of which is world travel that then becomes a proxy for one's willingness to entertain new scientific theories, in short to be "innovators" (1997:112 ff.).

Sulloway has other measures for indicating openness to experience and risk-taking, but for the purposes of this essay I am just focusing on world travel. As related to ordinal position, Simpson and his two older siblings follow the predicted pattern. His eldest sister Margaret ("Peg") had traveled very little, his next older sister Martha ("Marty") had traveled considerably more, including living for a while as an artist in Paris. Simpson himself traveled a great deal throughout his life, circumnavigating the globe and visiting, at one time or another, all the world's continents.

Simpson as Traveler

It is clear that George Gaylord Simpson was a scientific innovator by virtue, if nothing else, of his important contributing role in what Ernst Mayr has called the consolidation of the modern evolutionary synthesis (1980:ix, 37). Simpson's *Tempo and Mode in Evolution* (1944) integrated the new discoveries in population genetics and ecology with data and interpretations from the fossil record, many of the latter being original with Simpson himself (Laporte 2000:112 ff.) Allowing then that Simpson was an innovator, to what extent, if any, was he a traveler?

Table 1 summarizes where and why Simpson traveled during his lifetime. His reasons for travel were varied and he visited each of the six continents — including Antarctica — several times. Most of his travels were for professional reasons—to collect fossils, examine speci-

TABLE 1. Where and why Simpson traveled around the world.

	WHERE & WHY					
	Collect Fossils	Visit Museums	Consult Colleagues	Military Service	Tourism	Escape 1st wife
Central & South America	✓	✓	✓		✓	✓
Britain & Continent		✓	✓	✓	✓	✓
North/South/East Africa		✓	✓	✓	✓	
USSR		✓	✓			
Mongolia/China/India		✓	✓		✓	
Australia/New Zealand		✓	✓		✓	
South Pacific					✓	
Arctic/Antarctic					✓	

mens in museums, or consult with colleagues. Military service during the Second World War brought him to North Africa, Sicily, and Italy, and tourist curiosity to virtually everywhere else. Some of Simpson's travels were also motivated almost as much by wanting to escape a severely neurotic first-wife as to pursue his paleontological interests (Laporte 2000:1 ff.). Only once was Simpson's wanderlust thwarted: in 1934 he waited in Moscow for six unpleasant weeks trying to obtain permission to travel to Mongolia where he wanted to visit some fossil sites in the Gobi desert. Inextricably entangled in bureaucratic red tape and in danger of overstaying his Soviet visa, Simpson eventually returned home to the U.S. Forty-three years later, in 1977, he did finally make it to Mongolia, but by then his fragile health precluded any serious field work (Simpson 1978:77–78).

Early Travel Experiences

Simpson had already shown a proclivity for travel adventure when, in 1920 and not quite 18 years old, during a year off from college owing to family financial difficulties and living back in Chicago with relatives, Simpson says

> I felt that I must escape and [so] I worked out an ignoble but ingenious way of doing so. For a sum practically negligible but sufficient to keep me alive, I arranged to walk southward toward New Orleans wearing one shoe lined with a widely advertised brand of shoe-lining & one with ordinary lining. The proposed advertising never materialized, as both linings wore out rather quickly — in Kentucky — and within a day of each other, demonstrating no real superiority in the advertised product. I then quit walking except by necessity, but kept on toward New Orleans. I had almost no money and lived on stale rolls from local bakeries, a day's food for a nickel, and how sick I became of them! Some walking, an earned overnight lift on a boat, and a freight train, and I was in New Orleans in June (Simpson 1933).

As a youngster, Simpson had already taught himself International Morse Code and had earned a 2nd class radio operator's license. After his trip to New Orleans, he received an offer to ship out to South America on a freighter, but soon turned it down, deciding instead that he had taken enough time off from his formal education and should return to the university (author's interview with Simpson, 3 Feb. 1979, Tucson, Arizona).

At the end of his senior year at Yale, Simpson went off to France in the summer of 1923 to complete his French language requirement for graduation. An eager tourist, he visited all the sites — chateaux, museums, cathedrals — and wrote home the usual self-conscious and affected letters of a young, unsophisticated American experiencing the Old World for the first-time (Simpson, 1987: passim). Simpson spent the following summer, under the auspices of the American Museum, doing fieldwork in Texas and New Mexico, partly to gain fossil-collecting experience and partly to relieve the pressure of an already doomed marriage (Laporte 2000:41 ff.).

This pattern of travel and wife-avoidance was well established by the time Simpson completed his doctoral work at Yale in 1926, for he immediately went abroad to the British Museum in London to continue his study of Mesozoic mammals, arranging at his wife's insistence for her and their two infant daughters to spend the year in southern France. In the early 1930s, Simpson was off once again, this time for two year-long field seasons in South America. Although the South American travels were certainly justified by his ongoing mammalian research, there was the added benefit of being able to remove himself beyond the range of his now estranged, but still troublesome wife (Laporte 2000:6–8).

Attending Marvels

The first sojourn in South America resulted in *Attending Marvels*, published by Macmillan in 1934, which brought Simpson to the attention of the non-paleontological world, including a radio interview in New York City and front-page coverage in the *New York Times* Book Review (Fig. 1). The book's title was straight out of Melville's "Moby Dick"—"All the attending marvels of a thousand Patagonian sights and sounds . . ." (Simpson, 1934: frontispiece epigraph). This was the first of a number of non-specialist books that Simpson was to write over his long career, all of which had considerable travel commentary (Table 2).

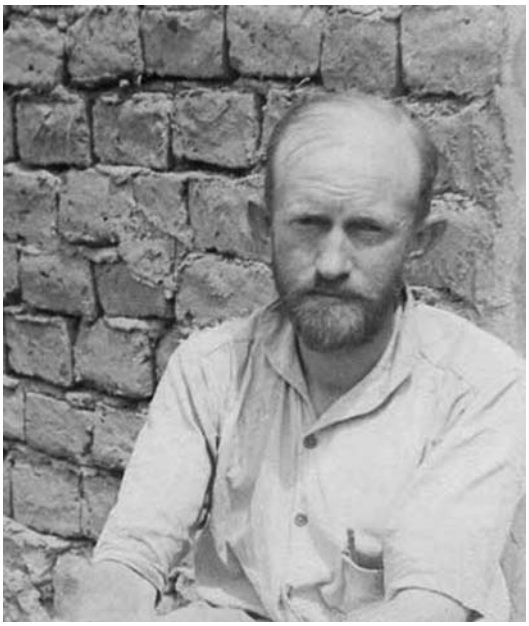

FIGURE 1. Simpson, age 31, in the field during his first Patagonian expedition, 1933–34.

A quote from the foreword of *Attending Marvels* provides some insight to the point of view that Simpson brought to this and his many other travel commentaries.

> This is an account of a scientific expedition, but it is more concerned with people and events than with science. A definite aim gives meaning and incentive to travel, but it does not keep voyages to the far corners of the earth from having interest and excitement not dependent on technical accomplishments (1934:xx).

The *New York Times* reviewer (R.L. Duffus) praised the book, saying,

> . . . informal as it is, it contains in essence the true scientific spirit.…With no direct discussion of its subject [of paleontology] at all, Dr. Simpson makes us see what happens when man cannot conquer Nature in which respect Patagonia is almost prehistoric. The reader should return to the problems of the 'the Machine Age' with a new and possibly more tolerant point of view (3 June 1934).

TABLE 2. Simpson's writings with my estimated percent of his included travel commentary.

SIMPSON'S TRAVEL WRITINGS	
Travel per se —	
"Attending Marvels," 1934, Macmillan	
"Travel Diaries," (APS, unpublished)	
Travel commentary in passing (%) —	
"Observations During a War," 1942-44, APS	(75%)
"Concession to the Improbable," 1978, Yale Press	(60 %)
"Discoverers of the Lost World," 1984, Yale Press	(25 %)
"Simple Curiosity," 1987, Univ. California Press	(50 %)

The reviewer in the *New Republic* (Isidore Schneider) was a little less enthusiastic, remarking that while

> Dr. Simpson writes with charm and liveliness, he suffers, however, from the peculiar sense of inferiority shown by some scientists who feel that their professional work is a bore to others, and that the gossip of the camp is more entertaining. When that feeling is in the ascendant, the book goes into a decline; but fortunately, after the author settles down to his task, the scientist takes hold and the result is a highly interesting book (1934, vol. 79).

In any case, *Attending Marvels* had sustained success since 1934, for it was twice reprinted: first in 1965 as one of a series of books in the Time Reading Program, and again in 1982 by the University of Chicago.

During his military service during the Second World War, Simpson wrote to his wife, Anne Roe, several times weekly over the course of two years. The letters cover Simpson's tours-of-duty in Algeria, Tunisia, Sicily, and Italy, and their travel content comprises, by my estimate, about three-quarters of the 272 pages of transcribed typescript now located in the archives of the American Philosophical Society.[2]

Simpson also provided an extensive accompaniment of travel writing in his other published works. The *New Yorker* reviewer (Jeremy Bernstein) remarked that "*Concession to the Improbable* is [Simpson's] autobiography — sort of. It is a mixture of travel stories (interesting and not so interesting), facts about flora and fauna from here and there, and at least a partial account of his long and full life" (*New Yorker*, 12 June 1978:132).

Discovers of the Lost World, published a month before Simpson's death, which tells of the history of paleontological exploration in South America, is strongly laced with travel lore (Simpson 1984). *Simple Curiosity*, the posthumously published volume of letters that Simpson wrote to his family between 1921 and 1970 is, again by my estimate, about 50% travel writing.

Nearly Fatal Travel

However much Simpson obviously enjoyed his travels and writing about them, there was one travel adventure that almost cost him his life and certainly had negative repercussions for the rest of his professional career. In the summer of 1956 Simpson joined Brazilian colleagues to look for fossils in the headwaters of the Amazon near the Peruvian border, a trip that in his words was to be "in some respects among the best of my many travels, in one respect much the worst." Two months into the trip, while a camp site was being cleared, a felled tree struck Simpson, and as he later recalled "it hit my head, giving me a concussion; my left shoulder, dislocating it; my back, bruising it; and my legs, dislocating my left ankle and shattering my right leg with a compound fracture of tibia and fibula. That event changed my life quite radically." Indeed, it ended what Simpson called his "halcyon period" of private and professional life that had begun with his discharge from the Army in late 1944 (Simpson 1978:166–170).

The remoteness of the accident resulted in a week's delay before Simpson received adequate medical treatment. Its seriousness meant that for two years he was unable to pay full attention to his responsibilities as chairman of the Department of Vertebrate Paleontology at the American Museum of Natural History. Or at least that is how it was perceived by the museum director and by one or two colleagues in his department. When eventually asked to resign the chairmanship,

[2] "Observations During A War; Excerpts from Letters of G. G. Simpson, 1942–1944." American Philosophical Society, Philadelphia, Manuscript Collection 31.

Simpson was infuriated — as he later said, "I resigned [from the Museum] rather than accept such a humiliating situation" (1978:170). Simpson soon accepted an Alexander Agassiz professorship at Harvard's Museum of Comparative Zoology, offered through the good graces of the MCZ's director and his colleague, Alfred Sherwood Romer. However, because of the continuing medical difficulties resulting from the Brazilian accident and other health problems, Simpson became increasingly cranky and next retreated to Tucson, Arizona, where he was given an appointment at the university. There his ego and body began to recover as he now basked in the adulation of more complaisant colleagues and the Arizona sun (Laporte 2000:240 ff.).

TABLE 3. Sulloway's method for estimating the probability of one's supporting radical conceptual revolutions with my estimates for G.G. Simpson in particular.

Predicted Probabilities of Supporting Radical Conceptual Innovations

A. BASE-RATE PROBABILITIES

	Firstborns (including only children)	*Middle children*	*Lastborns*
Individuals under the age of 30			
Social conservatives[a]	14	40	49
Social moderates[a]	48	77	84
Social liberals[a]	75	92	96
Individuals aged 30 to 59			
Social conservatives	6	22	26
Social moderates	25	58	66
Social liberals	52	82	86
Individuals aged 60 and over			
Social conservatives	3	12	15
Social moderates	15	44	50
Social liberals	36	72	76

Enter relevant base rate (A) here: 84 %

B. ADJUSTMENTS TO BASE-RATE PROBABILITIES

1. **Pronounced parent-offspring conflict** (add 30 percent for firstborns and 10 percent for laterborns) + Ø %
2. **Pronounced shyness** (add 20 percent for firstborns; subtract 15 percent for lastborns) ± Ø %
3. **Age spacing** (add 5 percent for firstborns, for close [0–2.0 years] or distant [more than 5.0 years] spacing; subtract 5 percent for laterborns, for close or distant spacing) ± −5 %
4. **Early parental loss and surrogate parenting** (subtract 15 percent for firstborns; add 10 percent for laterborns) ± Ø %
5. **Gender** (for women born before 1900, add 10 percent; for women born after 1900, add 5 percent) + Ø %
6. **Race and ethnicity** (add 10 percent for minorities) + Ø %
7. **Friendship** (add 10 percent for being a close personal friend of a radical innovator) + Ø %
8. . . . . *Total adjustments from Section B (preliminary)* −5 %[b]

C. Calculate the absolute difference between 50 percent and the applicable base-rate percentage (from Section A) 34 %

D. Subtract line C from 50 and divide the result by 50 .32 %

E. Multiply line B.8 by the fraction on line D −1.6 %

F. If line E is positive, add line E to Line A
If line E is negative, subtract line E from line A

This is the applicable predicted probability 82 %

Quod Erat Demonstratum?

What then can we say about Simpson and travel? I do believe that, as a laterborn, Simpson saw travel as a means of breaking out of the cowtown provincialism of early twentieth century Denver and his family, first by transferring to Yale in the senior year of college, then exploring Paris and its environs, and finally returning to England and the Continent a few years later. His early mammal studies at Yale and the British Museum established him as a bright young paleontologist who then had additional opportunities for travel, which not only were especially appealing to him professionally, but also provided the necessary domestic relief from a bad first marriage. Following Sulloway's thesis, I would claim that the urge to travel was an important aspect of Simpson's personality and not merely an incidental activity accompanying more serious work. The activity of travel and writing about it formed a significant part of Simpson's professional and personal life, even when, as in the case of the 1956 Brazilian expedition, it almost killed him.

Propensity to Rebel

I have offered here, in the case of G.G. Simpson, a post-facto corroboration of Sulloway's thesis that a penchant for trav-

el, especially world travel, is an indicator of a person being an "innovator," "a rebel," someone "open to experience," even at times a "revolutionary."

In Appendix II, Table 10, of his book, Sulloway provides a test of the "propensity to rebel" (Table 3). One can therefore see retrospectively what Simpson's "predicted probability of supporting radical conceptual innovations" would be. The three major factors to consider are birth-order, age, and social attitudes. Under social attitudes Sulloway claims that "political and religious beliefs deserve special attention." Further, he states, "because laterborns are more open to experience, they are more willing to revise what they have been taught by their parents."

Based on published and unpublished evidence, one can rate Simpson at least as a "social moderate" in his youth and middle age, giving him a base-rate probability of some 84 percent. For example, when barely a teen-ager, he turned from the strict Presbyterian upbringing of his parents, deciding that he did not want to foreclose the possibility of ever again "being naughty." Later, in his teens, he tried to dissuade his close neighborhood friend, Anne Roe, from her temporary conversion to fundamental Protestantism. His failure to do so contributed to a prolonged estrangement that only ended years later when she became his second wife (Laporte 2000:70–72).

Later, at Yale, despite the university's policy against undergraduates being married, Simpson secretly married his first wife, Lydia Pedroja. Subsequently, after his separation from Lydia, he kept his renewed friendship and eventual cohabitation with Anne Roe hidden from all except his immediate family and a few close associates (Laporte 2000:4, 8–9). In fact, he quite deliberately lied when asked directly by Carl Dunbar, a Yale colleague, if he was living with Anne. Simpson said, "definitely not." Dunbar replied that he was sure that Simpson "would certainly do nothing of the sort." This falsehood still bothered Simpson in his old age (author's interview with Simpson, 18 August 1982, Tucson, Arizona).

In explicit political terms, it is hard to locate exactly where along the political spectrum Simpson stood. However, given that there is no evidence that he espoused either strongly conservative or strongly liberal viewpoints, the public expression of which by themselves would tend to place him at one or the other end. I would therefore consider him "politically moderate," as defined by Sulloway as someone lying between the 25th ("conservative") and 75th ("liberal") quartiles of the population.

There is evidence of some parent-offspring conflict and shyness, and although neither can be labeled "pronounced," their effects in any case would virtually cancel out. We can subtract 5 percent for age spacing with his siblings: sister Peg was seven years older and sister Marty was four years older. All the other adjustments are not applicable: parent loss, gender, race and ethnicity, or close friendship with a radical innovator, which leaves about 82 percent predicted probability of Simpson's supporting radical conceptual innovation.

In the case of G.G. Simpson, then, both post-diction and prediction support Sulloway's theory that owing to their rebellious tendencies, laterborns are especially open to experience, one expression of which is world travel, and that then becomes a proxy for one's willingness to entertain new scientific theories, in short to be "innovators."

References

Harris, J.R. 1998. *The Nurture Assumption*. The Free Press, New York.

Laporte, L.F. 2000. *George Gaylord Simpson: Paleontologist and Evolutionist*. Columbia University Press, New York.

Modell, J. 1997. "Family niche and intellectual bent" (a review of Born to Rebel). *Science* 275:624–625.

Simpson, G.G. 1933. "Autobiographical Notes" (unpaginated). American Philosophical Society, Philadelphia.

SIMPSON, G.G. 1934. *Attending Marvels*. Facsimile reprint, University of Chicago Press, Chicago.
SIMPSON, G.G. 1942-1944. "Observations During A War; Excerpts from Letters of G.G. Simpson, 1942–1944." American Philosophical Society , Philadelphia, Manuscript Collection 31.
SIMPSON, G.G. 1944. *Tempo and Mode in Evolution*, Columbia University Press, New York.
SIMPSON, G.G. 1978. *Concession to the Improbable: An Unconventional Autobiography*. Yale University Press, New Haven.
SIMPSON, G.G. 1984. *Discoverers of the Lost World*. Yale University Press, New Haven.
SIMPSON, G.G. 1987. *Simple Curiosity: Letters from George Gaylord Simpson to His Family, 1921–1970*. Edited by L.F. Laporte. University of California Press, Berkeley.
SULLOWAY, F.J. 1997. *Born to Rebel: Birth Order, Family Dynamics, and Creative Lives*. Vintage Books, New York. (According to the colophon in the 1997 paperback edition, "Originally published in somewhat different form in hardcover by Pantheon Books, a division of Random House, Inc., New York, in 1996.")