Creative Genius as Causal Agent in History:

William James's 1880 Theory Revisited and Revitalized

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Abstract

Near the onset of his illustrious career, the psychologist William James proposed a theory of how individual genius can exert a unique and enduring causal impact on the history of civilization. After first attacking the prevailing view that sociocultural determinism rendered individual creators and leaders mere epiphenomena, James argued that the causal effect of the genius paralleled that of the spontaneous variation or mutation in the theory of evolution by natural selection. Although his specific arguments suffer severe problems even from the standpoint of his own theory, current psychological research on creativity and genius indicate how his basic thesis can be revised and updated with respect to creative genius. This revision and updating concentrates specifically on what is known about the behavioral productivity, thinking processes and procedures, personality characteristics, and early developmental experiences in highly creative individuals. These modern enhancements then lead to the integrated discussion of Jamesian free will and the causal agency of the creative genius. The net result is a revitalized theory of how it even becomes possible for single individuals to make creative choices that not only may cause changes in their own lives, but also alter the course of world history.

Keywords: genius; creativity; evolution; determinism; free will; William James

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William James left his biggest mark on general psychology with the publication of the 1890 textbook *The Principles of Psychology*. Still read today, and just as noted for its literary style as for its scientific insights, *Principles* treats several topics that have enduring importance in the discipline—such as the stream of consciousness, the James-Lange theory of emotions, and the nature of the self. Many of the chapters represent versions of articles published earlier in various periodicals, particularly in the philosophical journal *Mind*, which started publication in 1876, at the beginning of his career. An early example is James's 1879 paper addressing the question "Are We Automata?" that appeared later in an updated version in Chapter 5 of the *Principles*. In both the article and the chapter, James argues strongly for a negative answer to the posed question, maintaining that consciousness has an independent causal impact on the operation of the brain. Yet on related issues, James sometimes followed an extensive treatment in an article with more perfunctory discussion in the *Principles*. Thus, the section on "The Question of 'Free Will'" in Chapter 26 on "Will" is largely truncated by his assertion "My own belief is that the question of free-will is insoluble on strictly psychological grounds" (W. James, 1890/1952, p. 822; cf. Baer, Kaufman, & Baumeister, 2008). He then refers the reader to a more philosophically oriented article published a half dozen years earlier on "The Dilemma of Determinism" (W. James, 1884) for more extensive but non-psychological analysis. Nonetheless, it is obvious from the articles and the textbook chapters that James was very much concerned with defending an individual's causal agency. In his mind, determinism certainly did not hold full sway over personal thought and action.

Yet James published another article between 1879 and 1884 that dealt with a related topic, but without having any corresponding discussion in *Principles* (with a tiny exception to be discussed later). Entitled "Great Men, Great Thoughts, and the Environment," the article appeared in an 1880 issue of the magazine *The Atlantic Monthly* (now called *The Atlantic*). Here James expanded the scope of the person's causal agency from the circumscribed psychological realm—such as merely selecting what to attend to, deciding what to believe, or choosing a particular pathway to walk home—to the far more vast sphere of whole sociocultural systems. Certain individuals, at least, could make history via their spontaneous generation of "great thoughts" that had no identifiable causal antecedents in their society or culture. Appropriately enough for that time, he called these causal agents "great men." But if he were writing today he would have called them "geniuses" instead, a more gender-neutral term. The justification for saying this is that James switched to "genius" a dozen years later, namely in his 1902 *The Varieties of Religious Experience*. Consequently, the noun "genius" will be favored in the current essay (see also Ball, 2014). Although many of the concrete examples that James (1880) offers to illustrate genius come from political, military, and religious leadership, he also cites numerous instances of creative genius, such as novelist Charles Dickens, essayist Ralph Waldo Emerson, philosopher J. S. Mill, painter Rembrandt van Rijn, playwright William Shakespeare, and opera composer Richard Wagner.

The present article will in fact concentrate on creative geniuses as causal agents in history (cf. Grinin, 2010). This focus is partly driven by the need to keep discussion within reasonable bounds. Yet the focus is also motivated by the availability of a huge body of more recent psychological research on creativity and genius that sheds totally new light on James's original argument (for comprehensive handbooks, see Kaufman & Sternberg, 2010; Simonton, 2014c).

Even if James was surely not prescient enough to predict the state of psychological knowledge more than a century later, his core ideas are sufficiently profound to warrant revision and updating today. He was apparently justified in believing not only that individuals can create their own lives, but also that some persons can permanently create the world in which future agents will make their very choices. Even so, as will be seen, those geniuses cannot simply *will* history to happen their chosen way.

This article begins by providing an overview of James's (1880) theory regarding how individual genius can introduce original ideas into the sociocultural system, ideas that have causal sources which are independent of that system. I then turn to an evaluation, revision, and update of his theory, thereby bringing his arguments into the 21st century. These amendments will include a general discussion of what it actually means to exert free will in the context of a hypothetically deterministic world. With those modifications and additions, James's principal thesis remains: Eminent creators are indeed causal agents underlying historical change.

James's Original 1880 Theory

Historians often view James as the progenitor of what later became known as the Functionalist School of Psychology. This school was decisively shaped by Charles Darwin's 1859 evolutionary theory of natural selection. Thoughts and behaviors were seen as adaptive, as having functions. Significantly, it was James who first observed a striking connection between Darwin's theory and the specific phenomenon that motivated his 1880 essay. Indeed, he opens the article with the explicit one-sentence paragraph: "A remarkable parallel, which I think has never been noticed, obtains between the facts of social evolution on the one hand, and of zoölogical evolution as expounded by Mr. Darwin on the other" (p. 441). To document that correspondence more fully, James put forward a two-part argument. The first part was dedicated

to overthrowing the then-current theory of social evolution that nullified any role for the genius, whether creator or leader. The second part then concentrates on articulating the signal parallel between Darwin's evolutionary theory and the actual place of the genius in social evolution. Even if both positions are "evolutionary," the first is emphatically sociocultural and deterministic, whereas the latter is far more individualistic and indeterministic, and thus more consistent with James's views regarding personal free will as well (cf. McGranahan, 2011).

Contra Spencerian Sociocultural Determinism

Before delving into the rationale behind the supposed parallel, James decides to "prepare the ground" for his thesis by discussing what it means to have a scientific understanding of any particular event. He says "It is a common platitude that a *complete* acquaintance with any one thing, however small, would require a knowledge of the entire universe" (p. 441). Supposedly, "Not a sparrow falls to the ground but *some* of the remote conditions of his fall are to be found in the milky way, in our federal constitution, or in the early history of Europe" (p. 441). Alter any of these antecedents, however distant, then the sparrow might not have fallen by "the particular little street-boy who threw the stone" (p. 441). That boy might not even exist! James is describing a deterministic universe in which every single event is the upshot of an indefinite number of immensely long causal chains spreading throughout the cosmos and going back to the beginning of time—the moment of the Big Bang, as we would say nowadays.

This idea is often associated with Pierre-Simon Laplace, the French mathematician and scientist who first espoused such extreme determinism back in 1814. However, James has a different proponent in mind, namely, Herbert Spencer, the English philosopher whose determinism was far more directly related to James's thesis. Where Laplace focused on the determinism in the physical world, Spencer concentrated on the determinism inherent in the

human social world, a determinism ruled by the "laws of history." In particular, Spencer attacked the "great man" theory of history whereby singular individuals exert a lasting impact on the course of human events. James quotes at length from Spencer's 1873 *The Study of Sociology*, where it is argued that the genius explanation is far too vague to be considered a legitimate scientific account: "But now, if, dissatisfied with vagueness, we demand that our ideas shall be brought into focus and exactly defined, we discover the hypothesis to be utterly incoherent" (p. 33). Either the genius has supernatural origins, which is scientifically unacceptable, or else the genius is a natural phenomenon, in which case the genius must have had causal antecedents in the society in which he or she was born. "Before he can re-make his society, his society must make him" (p. 35), asserts Spencer, who then adds

> Even were we to grant the absurd supposition that the genesis of the great man does not depend on the antecedents furnished by the society he is born in, there would still be the quite-sufficient facts that he is powerless in the absence of the material and mental accumulations which his society inherits from the past, and that he is powerless in the absence of the co-existing population, character, intelligence, and social arrangements. (p. 35)

James goes on to quote other thinkers with similar Spencerian views. The consensus is strong: Geniuses cannot be considered causal agents in history both because they are themselves caused by history and because they lack the requisite power to freely exert their will over history. Creative genius is thus reduced to an epiphenomenon. Any "hero worship," such as seen in Thomas Carlyle (1841), totally lacks justification, merely giving credit where no credit is due.

James (1880) attacks this sociocultural determinism in two ways. First, he claims that it is not the genius theory that is vague, but rather Spencer's deterministic position. James offers a specific contrast between the two arguments:

> Suppose I say that the singular moderation which now distinguishes social, political and religious discussion in England, and contrasts so strongly with the bigotry and dogmatism of sixty years ago, is largely due to J. S. Mill's example. I may possibly be wrong about the facts; but I am, at any rate, "asking for particulars," and not "resting in general notions." And if Mr. Spencer should tell me it started from no personal influence whatever, but from the "aggregate of conditions," the "generations," Mill and all his contemporaries "descended from," the whole past order of nature in short, surely he, not I, would be the person "satisfied with vagueness." (p. 449)

In more general terms, because the genius theory ties explanation to individuals with actual proper names, the scientist can examine specific causal effects, both before and after the agent's distinctive "great thoughts" (cf. Ball, 2012). Those causes are unique to the person.

James's second attack begins with the observation, "The fact is that Mr. Spencer's sociological method is identical with that of one who would invoke the zodiac to account for the fall of the sparrow" (p. 449). Without imposed constraints, the number of potential causes becomes exponentially large, while all of those causes also become infinitesimally remote and weak. Only if the human intellect were infinitely omniscient—like a supreme being or "Laplace's demon"—would Spencer's method boast exhaustive explanatory precision.

Nor is James's argument purely epistemological, just acknowledging the limits of human knowledge. The argument is ontological, too. The configuration of potential causes of the sparrow's fall is such that the impact of the milky way, the federal constitution, and the early

history of Europe can all be effectively ignored as adding nothing substantial to the explanation beyond what we already know about the sparrow and the stone-throwing boy. James compares this deliberate and selective ignorance to the mathematician who deletes "quantities lying outside a certain range" as negligible when solving a problem in differential calculus, or to the astronomer who, "in dealing with the tidal movements of the ocean, takes no account of the waves made by the wind, or by the pressure of all the steamers which day upon night are moving their thousands of tons upon its surface" (p. 443). Once big, proximal causes are accounted for, minuscule and/or distal causes seldom enhance explanatory power. The swallow would still have fallen even if the Constitution of the United States of America had never added its Bill of Rights!

Needless to say, those large, proximal causes may directly involve the creative genius.

Pro Darwinian Evolutionary Indeterminism

Once James believes he has effectively demolished Spencerian sociocultural determinism, the stage is set for his application of Darwin's theory to understand the place of the genius in history. So James affirms

> that the relation of the visible environment to the great man is in the main exactly what it is to the "variation" in the Darwinian philosophy. It chiefly adopts or rejects, preserves or destroys, in short *selects* him. And whenever it adopts and preserves the great man, it becomes modified by his influence in an entirely original and peculiar way. He acts as a ferment, and changes its constitution, just as the advent of a new zoölogical species changes the faunal and floral equilibrium of the region in which it appears. (pp. 445-446)

Thus, in selecting the great ideas of the creative genius, the environment becomes transformed, thereby changing the conditions under which future geniuses will have their own ideas selected.

Yet the main point is that the genius, not the environment, will always constitute the initial causal agent of sociocultural change. As James says,

> social evolution is a resultant of the interaction of two wholly distinct factors: the individual, deriving his peculiar gifts from the play of physiological and infra-social forces, but bearing all the power of initiative and origination in his hands; and, second, the social environment, with its power of adopting or rejecting both him and his gifts. Both factors are essential to change. The community stagnates without the impulse of the individual. The impulse dies away without the sympathy of the community. (p. 448)

Note that James agrees with Spencer's point that geniuses cannot force the social environment to accept their ideas. That acceptance is beyond the genius's personal control. If otherwise, "neglected genius" would be impossible for any creative individual willing to engage in sufficient self-promotion. At the same time, James rejects Spencer's belief that the causal locus resides external to the individual. On the contrary, James argues that originality emerges from physiological and psychological ("infra-social") forces within the single thinker without whom the sociocultural system would languish. These internal forces produce a style of thinking comparable to the "spontaneous variations" and "mutations" in evolutionary biology—utterly unpredictable and unprecedented. In particular, James offers the following description of the processes by which the genius conceives great ideas:

> Instead of thoughts of concrete things patiently following one another in a beaten track of habitual suggestion, we have the most abrupt cross-cuts and transitions from one idea to another, the most rarefied abstractions and discriminations, the most unheard-of combinations of elements, the subtlest associations of analogy; in a word, we seem suddenly introduced into a seething caldron of ideas, where everything is fizzling and

> bobbing about in a state of bewildering activity, where partnerships can be joined or loosened in an instant, treadmill routine is unknown, and the unexpected seems the only law. (p. 456)

Admittedly, this description may seem a bit fanciful, even if translated out of its rich Victorian rhetoric. Moreover, as will be seen later, his descriptive hyperbole is mostly unnecessary to attain James's desired goal, which is to make the genius a causal agent.

The heading of this section inserts the word "indeterminism," but that noun must be qualified. James's treatment of the origins of great thoughts follows very closely Darwin's own concept of spontaneous variation. It's not that the variations are necessarily uncaused but rather that the causal sequences leading to a given variation are largely if not entirely unconnected to the causal sequences leading to the selection of that variation (cf. Kronfeldner, 2010). That disconnect between the two causal chains implies that a variation is not generated *because* it is already known to enjoy superior adaptive fitness, which would render the selection process pro forma rather than a bona fide decision. It is precisely because the variations are produced without guaranteed selective advantage that a "struggle for existence" (Darwin's term) or "survival of the fittest" (Spencer's term) becomes necessary to weed out the less adaptive variations. If all variations, whether biological or intellectual, were guaranteed to be adaptively equivalent, then any selection could be totally random. Flipping a coin would fulfill the task equally well.

In the case of variation, furthermore, the causal chains are often not as strong as those in the case of selection, for one or more links in the variation chains can even involve chance—a random switch in one direction or another. James wrote his 1880 essay 20 years before Gregor Mendel's genetic laws were rediscovered, and even longer before the role of mutations were truly understood. Yet he clearly believed that chance changes at the molecular level would

generate unexpected biological variations, just as chance changes at the physiological level would produce unanticipated ideational variations. Accordingly, James (1880) says that "the new conceptions, emotions, and active tendencies which evolve are originally *produced* in the shape of random images, fancies, accidental out-births of spontaneous variation in the functional activity of the excessively instable human brain, which the outer environment simply confirms or refutes, adopts or rejects, preserves or destroys,—*selects*, in short, just as it selects morphological and social variations due to molecular accidents of an analogous sort" (p. 456). The adjectives "random" and "accidental" render it unambiguous not only that the variations are not caused by the environmental circumstances responsible for later selection, but also that variations are not even caused in the first place, or at least not in any sense compatible with absolute determinism. Both genetic and cognitive mutations can thus represent indeterminism. Just as the course of biological evolution is not predetermined from the onset of life on this planet, so is the history of social evolution not preset from the beginning of human civilization. Random mutations can deflect either evolutionary trajectory on an unforeseen and unique path. The history of any given trajectory represents only one specific manifestation of an indefinite number of equally feasible alternative histories.

James's 1880 Theory Today

By the beginning of the current millennium, William James could be identified as the 14th most cited psychologist of the 20th century (Haggbloom et al., 2002). James's 1880 article certainly did its part in contributing to his citation count. According to a recently conducted search using Scholar Google, the essay received at least 480 citations, including 6 to the original article (a serious underestimate because of the nature of the database), 23 to a reprint in *Philosophy after Darwin: Classic and Contemporary Readings* (Ruse, 2009), and another 451 to

the reprint in James's (1897) own *The Will to Believe and Other Essays in Popular Philosophy* (under the altered title "Great Men and Their Environment"). Unfortunately, James made no effort to develop his theory in later publications, including in his *Principles*. In the latter case, Chapter 28 (on "Necessary Truths and the Effects of Experience") contains the single sentence "Every scientific conception is in the first instance a 'spontaneous variation' in someone's brain" (W. James, 1890/1952, p. 863), and adds a footnote elaborating only slightly:

> In an article entitled "Great Men, Great Thoughts, and the Environment" … the reader will find some ampler illustrations of these remarks. I have there tried to show that both mental and social evolution are to be conceived after the Darwinian fashion, and that the function of the environment properly so called is much more that of *selecting* forms, produced by invisible forces, than *producing* of such forms,—producing being the only function thought of by the pre-Darwinian evolutionists, and the only one on which stress is laid by such contemporary ones as Mr. Spencer … (p. 863)

Hence, James had not changed his mind about the basic truth of the thesis, even if his continued endorsement was hidden in a footnote that often gets lost as an endnote in many editions of the *Principles*.[1] Who reads such notes anyway?

Perhaps it would be too much to expect James to have developed his ideas further. After all, James lost interest in psychology shortly after publishing his textbook, famously calling the discipline "a nasty little subject." Although James (1902) briefly touched upon the topic of genius a dozen years later, it was in the context of the connection between genius and mental illness, sans any reference to the issues raised in 1880. As is well known, he ended his career as a philosopher, with a special focus on pragmatism. Even if pragmatism has patent links with functionalist ideas, its questions were more epistemological than psychological. Besides, once

James passed away in 1910, any opportunity to revise and update the theory had vanished once and for all. Yet since that date some major problems with his position have become ever more obvious. These shall be examined first. Then this article will treat the various ways that James's main thesis can be resuscitated by contemporary psychological science.

Some Major Problems with James's 1880 Theory

Conveniently, James can be analyzed in terms of his own theory. First, although we can't doubt that James was a "great man," we can question whether the sentence that opens his 1880 counts as a "great thought." Does he make a sufficient case for the thought's greatness? Second, we can inquire into whether the social environment was or is disinclined to select that thought. Is there a misfit between the idea and the evaluating milieu that lowers its ideational fitness?

James's great thought. Despite James's intellectual debt to Darwin, he seems to have overlooked the opening to the very last chapter of *Origin of Species* in which Darwin asserts that "this whole volume is one long argument" (C. Darwin, 1859, p. 399). According to his autobiography, Darwin got his own great insight in 1838, but did not publish it until more than 20 years later, and would have taken still longer if Alfred Russell Wallace had not sent him an 1858 manuscript arguing for a very similar thesis (F. Darwin, 1892/1958). Darwin knew that his theory would not undergo acceptance by the scientific community unless it was tightly argued and amply documented with diverse facts. Darwin had written a 35-page abstract of this theory in 1842 and a 230-page manuscript two years later, yet neither was deemed ready for publication. Only his closest colleagues were even aware of his ambitious efforts. So significant were Darwin's labors in elaborating the theory that Wallace himself never contested priority and even wrote an 1889 book called *Darwinism: An Exposition of the Theory of Natural Selection with Some of Its Applications*—which became Wallace's most cited publication.

James probably should have followed Darwin's example for his 1880 idea about the parallel between organic and sociocultural evolution. One problem is apparent at once: His thesis is oversimplified. For example, in his theory, ideational variation occurs at the level of the singular thought, whereas societal selection happens with respect to the individual. This disparity would only work if all "great men" had just one "great thought" apiece, making each genius the analog of the "one-hit wonder" in music (cf. Kozbelt, 2008). Yet one of the best established characteristics of the top-tier creative geniuses is their extreme productivity, producing lots of great thoughts rather than just one (Albert, 1975). Darwin's own career demonstrates that fact, just as does James's. Moreover, not all thoughts of the great are great (Simonton, 2010a; Sinatra, Wang, Deville, Song, & Barabási, 2016). Many, and perhaps even most, are mediocre if not plain wrong or ugly. Fortunately, any genius who enjoys sufficient domain-specific expertise should do a reasonable job at initially separating out the good and bad thoughts, thus sparing colleagues needless trouble. Darwin engaged in such extensive ideational editing in route to his *Origin*, which helps explain its immediate success. In short, selection can certainly take place at the individual level as well (Campbell, 1965; Simonton, 2011). Worse yet, social selection itself can operate at more than one level, such as the interpersonal, professional, sociocultural, and historical. James just glossed over all of these essential complications, letting his own great thought stand without presenting a sufficiently long argument to support it. To be sure, an adequate argument might have required a whole book, comparable in size to *Origin*. Yet it should come as no surprise that in psychology, books tend to have higher impact than journal articles (Heyduk & Fenigstein, 1984; Simonton, 1992). Explanations for complicated phenomena often require extended logical and empirical development, where psychological phenomena are

unquestionably more complex than biological phenomena (Simonton, 2015). James did not provide that requisite development for his thesis, great or not.

Another key weakness in James's treatment was his inability to specify the psychology of the variation process. Although he spoke of "infra-social" forces besides the physiological ones, he seems to emphasize instabilities in the brains of geniuses, thus betraying his early roots in physiology (i.e., his medical training).[2] Indeed, in 1880, when his essay was published, James had just signed the contract to write the *Principles* that was to appear a decade later. So perhaps he still had much more to learn about various possibilities. Or, given the state of the discipline at the time, there really was not much to say anyway. Even his textbook says nothing about the relevant processes. Ironically, the best he could do in 1880 was to paraphrase a portion of a statement put forward by William Stanley Jevons, an economist and logician rather than psychologist, who three years earlier had observed that

> It would be an error to suppose that the great discoverer seizes at once upon the truth, or has any unerring method of divining it. In all probability the errors of the great mind exceed in number those of the less vigorous one. Fertility of imagination and abundance of guesses at truth are among the first requisites of discovery; but the erroneous guesses must be many times as numerous as those that prove well founded. The weakest analogies, the most whimsical notions, the most apparently absurd theories, may pass through the teeming brain, and no record remain of more than a hundredth part. The truest theories involve suppositions which are inconceivable, and no limit can really be placed to the freedom of hypotheses. (Jevons, 1877/1900, p. 577)

The correspondences between this passage and the James quote given earlier should be obvious.

Naturally, the lack of specifics regarding the variation process was just as true of Darwin as James. Darwin died in 1882 without really knowing anything about modern genetics, including both recombination and mutation. Indeed, Darwin's theory of inheritance, pangenesis, was first experimentally challenged in his own lifetime by his cousin, Francis Galton.

James's social environment. The point made at the end of the previous section deserves emphasis: Darwin's own theory had so many loose ends at the time of his death that enthusiasm for Darwin's greatest thought somewhat waned in the latter part of the 19th and the early part of the 20th centuries. It was not until the advent of Neo-Darwinism or the Modern Synthesis in the late 1930s and 1940s, when natural selection was integrated with Mendelian genetics, that Darwin could undergo a full revival. That represents a very long hiatus!

In the meantime, Darwin's ideas underwent a rather pernicious transformation by becoming linked with what eventually became known as Social Darwinism where the "survival of the fittest" was applied to human societies, an application that justified imperialism, racism, and sexism. Yet it was not Darwin who initiated this movement but rather Herbert Spencer, who pushed the idea (even if not the specific term) after Darwin had passed away. Social Darwinism also became associated with the eugenics movement launched by Francis Galton, another posthumous development that lacked Darwin's endorsement. Nevertheless, even though James's own application to social evolution differed rather markedly from these other usages (McGranahan, 2011), it's conceivable that when Social Darwinism, eugenics, and similar positions finally became largely discredited, many psychologists would naturally be put off by the opening sentence of James's 1880 essay.

It is quite telling that when Donald Campbell (1960) proposed his blind-variation and selective-retention (BVSR) theory of creativity, he seems to have bent over backwards to avoid

any association with either Darwin or James. Neither has publications listed in the references section, and James is completely ignored. Even Darwin is merely mentioned to point out that Alexander Bain (1855/1977) had come up with an early version of BVSR creativity, namely trial-and-error problem solving, prior to 1859. Hence, as Martindale (2009) noted in his historical review, Bain proves that "It is certainly possible to formulate an evolutionary theory of creativity with no mention at all of Darwinian evolution" (p. 112). Interestingly, when Darwin was still working on his theory of evolution, a friend had recommended that he read Bain's 1855 work; Darwin actually purchased the volume and placed it on his library shelf, but never got around to reading it (Simonton, 2010b). Even more amazingly, although James cites Bain numerous times throughout *Principles*, including Bain's 1855 book, he never noticed the parallel between Bain's theory of creativity and Darwin's evolutionary theory. Perhaps that oversight resulted from the fact that Bain saw the variation-selection process operating within the individual mind rather assigning the selection stage immediately and exclusively to the social environment.

Increasing antagonism toward Darwinian social extrapolations may not have been the only ill fit between James's 1880 great idea and the environment. Another important intellectual trend was a revival of a sociocultural determinism that again minimized opportunities for the creative genius to function as causal agent in history. This revival ultimately spurred the downfall of the "great man" theory of history. This trend first became conspicuous among cultural anthropologists and sociologists, and then began to permeate psychology, particularly among historians of the discipline. For example, in 1917 the distinguished cultural anthropologist Alfred Kroeber discussed the phenomenon where two or more individuals independently arrive at the same discovery or invention. Among the most well-known examples are the theory of evolution by natural selection by Darwin and Wallace, the calculus by Newton and Leibnitz, and,

within psychology's own discipline, the theory of emotions independently proposed by James and Lange. Although Galton (1869, 1874) had noted this very phenomenon much earlier, Kroeber drew a very different and profound inference, namely that at a particular point in the evolution of any given sociocultural system certain discoveries and inventions become absolutely inevitable. Individual psychology, even genius, has nothing to do with it. Five years later William Fielding Ogburn, an eminent sociologist, provided an extensive list of independent discoveries and inventions in order to address the question "Are Inventions Inevitable?" (Ogburn & Thomas, 1922). His answer was positive. Sociocultural determinism was apparently established beyond doubt (Lamb & Easton, 1984).

In apparent ignorance of this earlier work, E. G. Boring (1927), a pioneering contributor to the history of experimental psychology (Boring, 1929), wrote an article documenting independent discoveries in physiological psychology. By mid-century he used this same phenomenon to help support a direct attack on the "great man" theory (Boring, 1950), including a scathing criticism of James's (1880) article. By this time Boring had also become familiar with both Kroeber and Ogburn, and thus the critique of the genius theory based on this phenomenon had become multidisciplinary. According to Boring, anyone who continued to focus on individual contributions to science was engaged in a personalistic rather than naturalistic enterprise—writing heroic rather than scientific history. Boring's interpretation and its long-term influence on the subsequent history of psychology textbooks was pervasive (Simonton, 1995). Generations of psychologists grew up rejecting the "great man" theory as unscientific (as well as ahistorical; Ball, 2012).

James's Theory Brought into the 21st Century

As specified at the outset, the focus here is the creative genius as one major guise of a person who generates great thoughts (thus leaving out the political, military, and religious leaders whose thoughts take the form of great actions; cf. Grinin, 2010). That means that James (1880) can be embedded in a rich psychological literature on creativity and genius that has arisen in the past half century or so. This research lends support to the inference that creative geniuses do truthfully function as causal agents in history. Yet this demonstration does not rely on "personalistic" or "heroic" positions, but rather depends on genuine scientific theory and data, thus representing a "naturalistic" approach to the phenomenon. More specifically, below I will offer overviews of what psychologists have learned about creative productivity, thought, personality, and development.

Creative productivity. It was already noted that the greatest creative geniuses are typically *not* one-idea creators. In fact, the cross-sectional variability in lifetime output is not only substantial, the most prolific creators tending to produce at least a 100 times more work than the least prolific, but the distribution is far from normal, the top producers occupying the upper end of an extremely stretched out tail (Simonton, 1997a, 2003). To put this highly skewed distribution in concrete terms, if IQ scores followed the same distribution while still maintaining a mean of 100 and standard deviation of 16, then a population of 10,000 persons would include some individuals whose IQs exceeded 300, more than 18 standard deviations above the mean (Simonton, 1988). Those on the upper tail thus represent the creative elite.

Yet, as mentioned earlier, not every work put out by creative individuals will contain a great thought. Instead, career will most often contain a mix of hits and misses, with the former vastly outnumbered by the latter (Simonton, 2010a; Sinatra et al., 2016). Moreover, the single

best predictor of the number of hits is the total number of attempts, that is, quality is a positive function of quantity (Simonton, 2003; Sinatra et al., 2016). Although some individuals will average higher hit rates than others, the chance element always remains paramount. For that reason, hits and misses are randomly distributed across the career course, the creators best work merely having the highest probability of appearing in that period when the creator is the most prolific, which usually happens in the first half of the career (Simonton, 1997a, 2010a; Sinatra et al., 2016). Across and within careers, the emergence of great thoughts in the creator's mind looks inescapably random.[3]

It is worth noting that this same probabilistic principle applies to the phenomenon of independent discovery and invention, or what has more conveniently been named *multiples* (Merton, 1961). Scientists and inventors vary in the degree to which they get themselves ensnared in such supposed duplications, yet such involvement is partially a positive function of cross-sectional variation in lifetime productivity (Simonton, 2010a). The higher the output, higher the odds of multiples participation. So to avoid getting involved in priority disputes, a scientist should publish very little. Not publishing at all works even better!

One final observation is critical to the argument: Once the social environment certifies a genius's thought as "great," that idea can endure for the remainder of history, marking a permanent contribution to human civilization. At least for the past two millennia, it has become relatively rare for recognized geniuses and their masterpieces to disappear altogether from the historical record (Ginsburgh & Weyers, 2014; Simonton, 1998). Indeed, some contributions will become iconic "classics" with an impact far in excess of the creator's actual output, such as happened to the plays and poems of William Shakespeare (Martindale, 1995). This endurance does not mean that fluctuations in acclaim will not take place. History is always undergoing

revision. For example, when Pablo Picasso was elevated to the status of the second greatest Western artist of all time, right below Michelangelo, the latter's contemporaries, Leonardo and Raphael, got bumped down to 3rd and 4th place (Murray, 2003). Yet it is hard to imagine any future discussion of the Italian Renaissance that will not make mention of either demoted artist.

Creative thought. For many decades, creativity researchers have been investigating the processes and procedures that can produce creative ideas, and their investigations have proven fruitful—indeed, far too fruitful. The outcome is a huge inventory of possible routes to getting a great thought (Simonton & Damian, 2013). Even a partial list must include divergent thinking, remote association, cognitive disinhibition (or defocused attention), analogy formation, systematic and heuristic search, behavioral tinkering, play, and exploration, juggling induction and deduction, conceptual reframing, broadening perspective, dissecting the problem, reversal, recombination and rearrangement, plus Janusian, homospatial, and sep-con articulation thinking (e.g., Carson, 2014; Guilford, 1967; Mednick, 1962; Ness, 2013; Newell & Simon, 1972; Rothenberg, 2015). Yet even if all of these work some of the time, absolutely none works all of the time. There is no such thing as *the* creative process or procedure. In fact, it has been well documented that—quite contrary to what James (1880) maintained—even ordinary thinking can lead to extraordinary outcomes (Weisberg, 2014). So what are we going to make of this heterogeneous mess? Is there anything that all of these processes and procedures have in common that can be used to place them under a single superordinate psychological mechanism?

The answer is affirmative. To see how, we must make three primary observations.

First, all forms of creativity can be safely assumed to be combinatorial in nature, that is, each thought entails a combination of prior ideas. This assumption is often explicitly stated by many creativity researchers. For instance, Mednick (1962) defined "the creative thinking process

as the forming of associative elements into new combinations which either meet specified requirements or are in some way useful," then adding that "more mutually remote the elements of the new combination, the more creative the process or solution" (p. 221). The combinatorial nature of creativity is certainly apparent in the creative products themselves. For example, Thagard (2012) scrutinized 100 top discoveries and 100 top inventions, showing that without any exception whatsoever each could be broken down into some variety of combinatorial event. In the arts, psychologists have established how Pablo Picasso's famous *Guernica* painting can be analyzed into a complex combinatorial outcome of diverse images and thematic material (Damian & Simonton, 2011; Weisberg, 2004). Moreover, many highly creative scientists, such as Albert Einstein and Henri Poincaré, have published introspective reports pointedly expressing their reliance on combinatorial processes to arrive at their respective great thoughts (Hadamard, 1945; Poincaré, 1921). Whatever the diversity of the processes and procedures associated with creativity, they must all share this single capacity for generating combinations.

Second, not all combinations are creative, and indeed the overwhelming proportion lack any creativity at all. An obvious example are the personal habits to which James (1890/1952) devoted all of Chapter 4. Every habit represents a specific combination of behaviors or thoughts that feature an extremely high probability of emission because that combination is not only highly useful, but also well known to be useful owing to past experience and practice. An instance is the routine procedure by which I make coffee each morning: Various actions are combined in an automatic manner, yielding a cup to wake me up. In stark contrast, although a creative combination must also be highly useful, like any habit, it must also have a low probability precisely because its usefulness is not already known in advance. It is for this reason that the creativity of any given combination has been defined as $c = (1 - p)u(1 - v)$, where p

represents the combination's initial probability, *u* indicates the combination's final utility (i.e., ultimate effectiveness, meaningfulness, value, appropriateness, etc.), and *v* gauges the person's prior knowledge of that utility (Simonton, 2016). Here *c*, *p*, *u*, and *v* are all continuous parameters ranging from 0 to 1, like probabilities or proportions. Note, too, that $(1 - p)$ can be called the combination's originality, while $(1 - v)$ can be called the combination's surprise (viz. the degree to which prior ignorance of the combination's utility has been decreased). Hence, a combination's creativity is the joint product of its originality, utility, and surprise (see also Boden, 2004; Simonton, 2012b). Simple calculation makes it evident that a routine thought or behavior, which exhibits the parameter values $p = u = v = 1$, has a creativity value of $c = 0$.

Third and last, the creativity of a combination can be assessed at two distinct levels. On the one hand, the individual creator can judge a combination's creativity at the moment the combination is conceived and evaluated. This judgment is purely psychological. In other words, the assessment occurs as the outcome of a trial and error, generate and test, or BVSR episode (Bain, 1855/1977; Campbell, 1960; Newell & Simon, 1972). This evaluation then decides the combination's *personal* creativity (Simonton, 2016). On the other hand, once the combination is communicated to others, such as colleagues, consumers, critics, or audiences, those persons will make their own judgments, and thereby determine the combination's *consensual* creativity (Simonton, 2016). Presumably, the combination will not normally undergo submission for consensual assessment until it first undergoes evaluation at the personal level—an important departure from James's (1880) original formulation, which overlooked that intervening selection process. The individual first selects those combinations that are deemed creative, and then hopes that the "social environment" will agree with that personal evaluation when those combinations are offered for consideration. As when any manuscript is submitted for peer review!

Given that the personal assessment of creativity must, in any case, precede the consensual assessment, it must then be asked how the individual arrives at highly original, highly useful, and highly surprising combinations. The answer is simple: Apply any process or procedure that works! No one-size-fits-all method will do the job. That's precisely why so many different approaches have been identified in the first place. The only commonality in these processes and procedures is that they all represent alternative ways of generating low probability combinations with unknown or poorly known utilities. The utilities must then be assessed post-generation via personal selection with the hope that some combination will appear that is worthy of subsequent exposure to consensual selection. In terms of Campbell's (1960) theory of creativity, individuals must engage in some two-stage blind-variation and selective-retention process or procedure, where the term "blind" here just refers to the unknown utility value (i.e., $v \rightarrow 0$). If the utility is pretty much known in advance (i.e. $v \rightarrow 1$), then either the combination would not be generated in the first place (because $u \rightarrow 0$ and hence $p \rightarrow 0$; e.g., a response that already underwent extinction as useless) or it would not be considered at all creative (because $u \rightarrow 1$ and hence $p \rightarrow 1$; e.g. a habitual response). It follows logically from the definition of personal creativity that it cannot maximize unless the prior knowledge of the utility minimizes (Simonton, 2013c). Thus arises the need for *blind* variations—combinations with insufficiently known utility values.

At this juncture another substantial departure from James (1880) must be emphasized: In drawing the analogy with biological evolution, James felt the need to stress the randomness of the creative process. Biological evolution depends on molecular accidents, so social evolution must depend on physiological or psychological accidents. Yet as Campbell (1960) noted, randomness is not at all required, just blindness. Although a randomly generated combination is inevitably blind, a blind combination does not have to be randomly generated. Campbell gave the

example of any systematic search, such as methodical generate-and-test sequences applied to a set of alternative combinations (Simonton, 2011). Obviously, a combination would not undergo an evaluation if its utility were already known in advance, so each alternative combination must be blind to a substantial degree, particularly if no assurance even exists that any combination in the set will prove useful (see "exploration" rather than "elimination" in Simonton, 2013a). Even if the set of combinations is guaranteed to contain one useful one, the blindness of each combination to be tested will most often increase with the size of the set (e.g., Watson's discovery of the DNA code; Simonton, 2011). If the prior knowledge of the utilities is perfect, nothing needs to be done. Yet the individual is not then venturing into the unknown.

After dismissing James's (1880) original requirement that great thoughts depend on chance, I will now assert that the net effect of applying sundry processes and procedures to generate a diversity of ideational combinations will effectively operate just like chance (Simonton, 2003). To the extent that a great thought attains the highest level of creativity—such as revolutionary new scientific theory—it will not be known beforehand which process or procedure will provide the most creative combination (cf. the "No Free Lunch Theorem" discussed in Nickles, 2003). Moreover, even within a given process or procedure, useful and useless combinations will emerge in a more or less chaotic order to the degree that prior knowledge of their utilities is very low (because, if otherwise, the probabilities should correlate positively with the utilities). The best thought can even come last, after a long incubation period (when $p = 0$). The overall result will be a random distribution of great thoughts across any creative career (Simonton, 2003). As a consequence, formal models which assume that combinations are generated by chance mechanisms have displayed considerable predictive success (Simonton, 2010a). For example, such models predict the central empirical findings

regarding multiples—and thereby completely undermine the traditional deterministic interpretation of the phenomenon! In essence, multiples are coincidences.

Creative personality. According to the foregoing analysis, the capacity for generating great creative thoughts appears unstable, making it seem that creative genius must be considered a transient state of the person rather than an enduring trait. Yet that appearance of instability is unjustified. Besides the general continuity provided by domain-specific expertise, a stable disposition underlies the random hits and misses, a disposition that helps make everything possible. Most recently, one such dispositional trait has been identified with the openness to experience factor of the Big-5 Factor Model (McCrae & Greenberg, 2014). This dimension incorporates such key traits as intellectual curiosity, preference for variety, aesthetic sensitivity, and active imagination or fantasy. Not only is openness positively correlated with creative achievement, but it is also relatively stable over the lifespan. Although openness may somewhat decline in the later years, those individuals who are highly open relative to their cohort will very likely remain so as they age, and thus maintain their creative edge.

This dispositional openness really throws a monkey wrench into Spencer's rigid sociocultural determinism, which assumes that the society must first make the genius before the genius can re-make society, thus rendering the genius a mere passive intermediary for the whole system to get from one point to the next. Instead, openness implies that highly creative individuals are acquiring an immense amount of knowledge and skill outside of the societal conventions. These are the students whose omnivorous reading goes well beyond the required school texts, who engage in extracurricular activities tangential to the main coursework, and who may even go so far as not study for an upcoming exam because some cultural, intellectual, or aesthetic opportunity has attracted far greater interest. Yet these very extraneous experiences

may contribute to creative insights that would otherwise be overlooked. For example, Galileo's avid interest and training in the visual arts, and particularly in the use of chiaroscuro, enabled him to interpret the bright spots and shadows of the lunar surface in terms of earth-like mountains, an interpretation completely missed by his predecessors (Simonton, 2012a). Needless to say, skill in drawing lights and darks to indicate three-dimensional shapes was not part of any astronomer's formal education at the time, just like it isn't today.

Speaking more generally, highly creative scientists are more likely than their less creative colleagues to pursue avocations in the arts notwithstanding the expressed irrelevance of the arts in the scientific curriculum (Root-Bernstein et al., 2008; Root-Bernstein, Bernstein, & Garnier, 1995). These interests often crop up in the scientist's work without any antecedents whatsoever in the sociocultural system. Nothing taking place in contemporary theoretical physics would have predicted Murray Gell-Mann's introduction of the quark and the Eightfold Way. Those concepts came from his private exposure to James Joyce's *Finnegan's Wake* and Buddhist scripture, respectively. Neither reading was considered standard fare in the curriculum planned for a theoretical physicist. Driven by curiosity, Gell-Mann's intellect was patently self-made.

It is significant that openness to experience correlates positively with cognitive disinhibition as well (Carson, 2014). This trait means that highly creative individuals are less likely to filter out supposedly irrelevant input, whether external stimuli or internal associations. Although this cognitive trait can sometimes prove inconvenient, distracting the person from the task at hand, the same defocused attention can lead to major serendipitous discoveries as well. The prototypical illustration is the discovery of the antibacterial properties of the *Penicillium* mold by Alexander Fleming, a discovery based on his chance observation of a staphylococci colony destroyed by the fungal contamination. Most expert bacteriologists would have just

thrown the petri dish into the autoclave without drawing any profound inferences. A priori, mold was a trivial irrelevancy.

Notice how serendipity ties in with James's (1880) suggestion that the causal sequences leading to ideational variations are divorced from those sequences governing the selection of those variations (see also Cannon, 1940; Kantorovich & Ne'eman, 1989). The spoiled bacteria culture was not generated *because* it would allow Fleming to discover a miracle drug. Instead, the event occurred quite by chance, and Fleming had the openness to stop and think about the event's implications. As the psychologist B. F. Skinner (1959) once stressed, "a first principle not formally recognized by scientific methodologists: when you run onto something interesting, drop everything else and study it" (p. 363). Yet Skinner's advice works only when you first realize that something interesting has been encountered. Accordingly, the physicist Ernst Mach (1896) warned that many fortuitous events "were seen numbers of times before they were noticed" (p. 167). Not all are willing to take notice of a great thought knocking at the door. The willingness to notice what others ignore then indicates that the creative genius provides an essential link in the causal sequences leading to the consensual assessment. The advent of penicillin needed a specific discoverer before it could become socially certified as a discovery.

I would be remiss if no mention were made of cognitive disinhibition's dark side: It is also associated with psychopathology (Carson, 2014). The inability to filter out extraneous inputs from inside and outside can overwhelm an individual to the point of disconnecting the person from the actual world. Hallucinations and delusions take over instead. So why does cognitive disinhibition sometimes lead to creative genius and other times to uncreative madness? Although a complete answer is elusive, one significant factor is the person's general intelligence, which serves as a decisive moderator variable (Carson, 2014). With sufficient intellect, and the meta-

cognitive control it implies, the initially unfiltered influx of associations and stimuli can be channeled into more productive avenues, including those that can generate potentially great thoughts. In the absence of a sufficiently imposing intellect, the irrational ideas take over.

Although William James was seldom able to anticipate future psychological findings, in this case he was spot on. In 1902 he observed that

> The nature of genius has been illuminated by the attempts ... to class it with psychopathological phenomena. Borderline insanity, crankiness, insane temperament, loss of mental balance, psychopathic degeneration (to use a few of the many synonyms by which it has been called), has certain peculiarities and liabilities which, when combined with a superior quality of intellect in an individual, make it more probable that he will make his mark and affect his age, than if his temperament were less neurotic. (pp. 22-23)

He then concluded a bit later

> Thus, when a superior intellect and a psychopathic temperament coalesce—as in the endless permutations and combinations of human faculty, they are bound to coalesce often enough—in the same individual, we have the best possible condition for the kind of effective genius that gets into the biographical dictionaries. (pp. 23-24).

Those who know James's intimate biography will recognize that the above statements are somewhat autobiographical. Suffering from various mental disorders throughout his life, and often depressed and even suicidal, James was intellectually brilliant as well, and thus could channel any psychopathological tendencies into the production of many truly great thoughts, like those just quoted. Note as well that James (1902) was not arguing that the genius is outright mentally ill. Clinical psychopathology would normally terminate creativity, not enhance it. In

James's specific case, his own subclinical symptoms did not attain the frequency or intensity to prevent him from contributing well over 100 publications spread over more than 30 years (Anonymous, 1911)—besides serving as a highly successful Harvard professor for more than a quarter century.[4]

Creative development. Openness to experience, general intelligence, and any tendencies toward subclinical psychopathology all count as relatively stable traits that have a substantial genetic foundation (Bouchard, 2004). In that sense, creative genius can be said to be born rather than made. Indeed, this genetic influence provides yet another example of a causal sequence that impinges on social evolution without being influenced by the sociocultural system. Unless a society were to introduce a massive eugenic intervention that breeds humans like cattle, the mating and parenting choices made by individuals lie outside the system. Moreover, the complexities of genetic inheritance with respect to creative genius would render any such intervention impractical anyway (Johnson & Bouchard, 2014). Even Nobel laureate sperm banks will not do the trick (Plotz, 2005). Pre-fab born genius is most likely impossible.

Obviously, a major reason why behavior genetics cannot tell the whole story is that the early environment also plays a key role. Even Galton, after first advocating "hereditary genius" (Galton, 1869), soon backed off enough from genetic determinism to introduce the nature-nurture issue into the scientific study of exceptional creative achievement (Galton, 1874). He was actually the very first investigator to identify birth order as a purely environmental influence. The impact of the environment on creative development might then provide the opportunity for society to shape the future genius, and thus minimize his or her personal causal impact. Spencer would thus seem vindicated. The principal problem with saving his sociocultural determinism this way is that environmental factors do not operate in the mandated manner.

The biggest problem is that a considerable empirical literature has documented the developmental importance of "diversifying experiences" in childhood and adolescence (Damian & Simonton, 2014). These are events that "help weaken the constraints imposed by conventional socialization" (Simonton, 2000, p. 152). In particular, "highly creative individuals stem from unconventional backgrounds (e.g., cultural or religious minorities, sickly dispositions, early orphanhood, or financial trouble), [and] had unconventional educational and training experiences (e.g., studies abroad, multiple mentors, voracious reading, and diverse hobbies)" (Damian & Simonton, 2014, p. 389; see also Damian & Simonton, 2015). The short-term effects of diversifying experiences have even been simulated in laboratory experiments (Ritter et al., 2012; cf. Vohs, Redden, & Rahinel, 2013). Although the impact of these experiences varies across creative domains—higher influence in the arts than in the sciences—their developmental importance still cannot be denied.

In the specific context of Spencer's sociocultural determinism, one type of diversifying experience has special interest, namely, multiculturalism, which also has a positive impact on creativity (Leung, Maddux, Galinsky, & Chiu, 2008; Maddux, Adam, & Galinsky, 2010; Saad et al., 2013). Creative geniuses whose development includes the substantial influx of influences from outside the mainstream society or majority culture can no longer be taken as the mere powerless servants of sociocultural system to which they relay their preordained great thoughts. No wonder, then, that civilizations often undergo a major Golden Age of creativity after they successfully assimilate novel ideas from foreign cultures (Simonton, 1997b, in press). Multiculturalism likely facilitated James's phenomenal creativity as well: Educated in both the United States and Europe, he became fluent in both German and French (as well as extremely

adept in his native English); he also pursued artistic training under William Morris Hunt before switching to the sciences and then to medicine—only to end up in psychology and philosophy.

The heterogeneity of developmental backgrounds also shows up in the multiples phenomenon (Simonton, 2010a). Although two independent discoveries or inventions may be labeled as duplicates, close examination of the alternative claimants most often reveals stark contrasts; any similarities can even be well outnumbered by the dissimilarities (as often legally established in lawsuits over rival patent claims). Newton and Leibnitz did not invent exactly the same calculus, nor did Darwin and Wallace put forward equivalent takes on evolutionary theory—plus the James-Lange theory of emotion can be divided into James's and Lange's versions. Creativity is a combinatorial process that must operate with the ideas put in each individual's ideational hopper, and thus creators with different intellectual backgrounds will end up with distinct versions of the putative multiple (see also Footnote 3). Consequently, when sociocultural determinists contend that a particular discovery or invention becomes absolutely inevitable at a specific place and time, what they should really say is that some recognizable approximation of the idea may appear somewhere, at some time or another, eventually. But then, with this admission, the determinism completely vanishes! At this point, too, it matters *who* makes the specific contribution, bringing the causal analysis back to the individual genius.

Free Will and Causal Agency

To address the fundamental question that drives this article, I must first examine James's presumed position on free will taking place at the individual level and then advance to what it means for a creative genius to serve as a causal agent at the sociocultural level. These two issues are closely related but not equivalent.

Jamesian Free Will

As said in the introductory section, William James was very much obsessed with free will. Indeed, back in 1870, just one year out of medical school, he resolved a deep personal crisis by asserting that his "first act of free will shall be to believe in free will" (H. James, 1920, p. 147). Unfortunately, James was not a particularly systematic or formal thinker, often presenting his ideas in concrete scenarios and a popular style. However, Doyle (2010) has argued that a two-stage model of free will can be reasonably abstracted from James's 1880 and 1884 articles. The two stages are briefly described as "first chance, then choice" (Doyle, 2010, p. 1). Alternative options would first be "randomly" generated, but the selection of a specific option would be self-determined at the moment the person makes the decision. Thus, the "two-stage model effectively separates chance (the indeterministic free element) from choice (an arguably determinate decision that follows causally from one's character, values, and especially feelings and desires at the moment of decision)" (p. 8). The temporal separation permits "Jamesian free will" to integrate both indeterminism and determinism, solving the problem that either condition taken totally alone is definitely antithetical to personal agency. The options are randomly produced, but the choices are determined.

This conception of free will has obvious parallels with Donald Campbell's (1960) blind-variation and selective-retention theory of creativity (Simonton, 2013b). Both the variation and the selection takes place within the individual's mind. Moreover, remembering that all random variations are perforce blind, selecting a randomly generated option that is judged to be the most useful is equivalent to "first chance, then choice." Consequently, any creator engaged in the BVSR process in which the variations are randomly generated must be engaged in making free choices by the Jamesian definition. Because the combinatorial mechanism that generates

thoughts very often operates *as if* it is random, as described earlier in this article (see Simonton, 2003, for more discussion), creative thoughts can represent acts of free will (Simonton, 2013b).

Yet it must then be asked: If the source of the BVSR variations is blind but not random, can those acts of creativity still count as acts of free will? For example, if a person came up with a creative idea via a systematic search through a range of possibilities without prior knowledge of their utilities, would that still count as a free choice given that the options were blindly generated? It would seem that the answer is affirmative, in which case the expression "first chance, then choice" is too restrictive. A more inclusive description be, "first blind options, then choice." That is, the alternatives must be generated with little or no prior knowledge about which alternative will be later judged the best on which to act. If otherwise, then the chosen idea or response is neither creative nor free of prior determination—as in routine or habitual behavior.

Simonton (2013b) provides far more detailed formal analyses and concrete illustrations, so may it suffice here to say that the creative genius is undoubtedly exerting Jamesian free will, with just the added proviso that chance is not strictly required, only blindness.

Causal Agency of the Creative Genius

It would be convenient if we could just conclude that Jamesian free will is sufficient to justify the inference that the creative genius must be a causal agent in history. Yet that justification is not obvious. After all, the determination of whether an idea constitutes a great thought has now shifted from the individual genius to the sociocultural system. Although the individual's choice (the selective-retention part of BVSR) is independent of the option generation (the blind-variation part of BVSR), and hence personally free, might it be still be possible for those variations to be determined in such a way that the creator invariably becomes causally peripheral? He or she may not know it, but the zeitgeist, or "spirit of the times," might

have just chosen the individual to produce the ideas that are guaranteed to be selected by the society at large. The individual persists as nothing more than the spokesperson of the age, without leaving any direct causal impression on the age, other than leaving a proper name associated with the societally identified great thoughts. If so, Spencerian sociocultural determinism would seem vindicated. Two main problems confront this supposed vindication.

First, to the extent that exceptional creative thought depends on chance, then it is difficult to argue that such creative thought is also determined by sociocultural causes. Even if the system provides the initial ideas that are input into the combinatorial process or procedure, once the ideas are subjected to that mechanism, the system loses complete control over the outcome. Society can provide the coin, but not fix the outcome of the coin toss. The social environment then has no other option but to wait for what emerges at the other end, and then engage in its societal selection. The intervening chance events taking place within the individual's brain breaks the causal chain needed to connect the sociocultural antecedents with the eventual historical changes. This break is precisely why James (1880) put so much emphasis on the "instable human brain" that produced results akin to spontaneous variations or mutations.

Second, even if we leave aside the question of whether creative thought actually functions as if it were dependent on a random process or procedure, the other central phenomena of creative genius—productivity, personality, and development—just do not operate in the manner expected of deterministic outcomes. Starting with productivity, why would the impact of a person's output seem so dependent on chance? For example, why would a scientist have so few high-impact works relative to total output, and why would those high-impact works be randomly distributed across the career? Similarly with respect to personality: If sociocultural determinism held, then wouldn't it seem that the system was dependent on precisely the wrong persons to

serve as causal links? For instance, why favor individuals who are unusually open to experience, including experiences outside the mainstream culture? Why prefer persons who display more cognitive disinhibition, and thus are less likely to stay on track during formal education and professional training? Why not rule out entirely those with any inclinations towards psychopathology, making sure that all creative geniuses are stable and conforming to elementary societal norms? Lastly, with regard to creative development, why would diversifying experiences have a positive rather than negative effect? For example, why would multicultural experiences enhance a particular society's causal control over its most highly creative individuals? Taken altogether, creative thought, productivity, personality, and development just do not display the telltale features that would be expected from sociocultural determinism. Nobody, neither the genius nor the society, seems in charge of history and historical change. James's (1880) parallel with biological evolution triumphantly returns. Spontaneous variants are not inert conduits.

To be sure, creative genius in the sciences will generally operate under stronger sociocultural constraints than creative genius in the arts. The less random nature of scientific history falls in line with the more conventional dispositional and developmental characteristics of scientific creators relative to artistic creators (Simonton, 2009). Yet at the same time, the history of science still does not progress in a manner consistent with Spencer's sociocultural determinism—and particularly not in times of scientific revolutions. Notably, even though eminent scientists generally exhibit appreciably less subclinical psychopathology than eminent artists (Simonton, 2014b), eminent scientific revolutionaries are more prone to display such symptoms than those scientists who attain eminence by preserving the received disciplinary paradigm (Ko & Kim, 2008). The more revolutionary the thoughts, the fewer the societal constraints on those thoughts.

Conclusion

All told, with suitable revision, and with the appropriate incorporation of current research on creativity and genius, James's (1880) original theory claims considerable merit. Out of the creator's mind emerges ideas that cannot be considered mere effects of sociocultural determinism. Of course, to revitalize James's theory, some critical changes were necessary. For instance, where he only had selection happening at the societal level, it was found necessary to impose an earlier selection phase occurring at the individual level. The creators first freely select what ideas they deem creative, offer them before the world, and wait to see whether those ideas receive consensual endorsement. Another critical change was to remove James's original stipulation that great thoughts be produced by an inherently random mechanism. Creative processes or procedures only need to generate possibilities that are *blind* to their eventual utilities, as determined later in the selection phase. That said, when creative thought, productivity, personality, and development are carefully examined, it becomes obvious that none of these aspects of creativity betray any evidence that they are the upshot of an underlying deterministic order, and certainly not the products of sociocultural determinism. Indeed, it is perfectly possible to model the production of great thoughts in terms of random combinatorial mechanisms. The phenomena simply behave as if they were the outcomes of chance.

Apropos of the last comment, even if total Spencerian sociocultural determinism has been summarily rejected, Laplacean physical determinism is neither rejected nor affirmed. The current analysis holds even if everybody, including creative geniuses, live in a deterministic universe where chance has a deep-rooted determinism.[5] Even in that scenario, the genius remains as a causal agent in history because creative acts are still uncaused by the sociocultural system. Had William Shakespeare died in his crib, we would now live in an immeasurably different world.

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Footnotes

[1]James (1880) did respond to some critical commentary in a brief 1890 article on "The Importance of Individuals" later reprinted in James (1897, pp. 255-262). Nonetheless, the latter addition did not really enhance his argument in any important way. James mostly argued for the significance of substantial individual differences that were denied by non-psychologists. By James's own admission, the editors of *The Atlantic Monthly* rejected his reply when he submitted it for publication and it ended up after some delay in *Open Court*.

[2]James's very first course in psychology was the one he himself taught at Harvard in the 1875-1876 academic year—which was the first psychology class offered anywhere in the United States. Even then, the course concerned the relation between physiology and psychology. James was entirely self-educated with regard to contemporary psychological research.

[3]To offer a recent but typical example of independent discovery, what Simonton (2010a) called the "equal-odds baseline," Sinatra et al. (2016) labeled the "random-impact model." Then both formal treatments introduced a special term that accounted for consistent departures from chance expectation (u_i in Simonton and Q_i in Sinatra et al., where i in both models indexes a given individual). Although Sinatra et al. cite Simonton's (1991, 1997a) earlier papers, they were unaware of his much later work introducing u_i, thus making their Q_i an authentic independent discovery. Even more remarkable, the idea emerged from two different directions. Where Simonton (2010a) was engaged in developing a BVSR combinatorial model of creative genius applicable to art, science, and technology, Sinatra et al. (2016) were conducting an empirical investigation into the differential impact of many thousands of scientists, some exceptional, like Nobel laureates, but the vast majority not nearly so distinguished. Yet top down and bottom up formal and statistical developments converged at the same place for, conceptually, $u_i \approx Q_i$.

[4]The proverbial "mad-genius" controversy still attracts research (Kaufman, 2014). Unhappily, much of the empirical work continues to confound what are demonstrably orthogonal hypotheses (see, e.g., Simonton, 2014a). Moreover, the bulk of the inquiries focus on college student participants taking psychometric measures rather than study actual creative geniuses using at-a-distance historiometric methods (Song & Simonton, 2007). When the latter approach is adopted, then achieved eminence in creative domains is associated with subclinical levels of psychopathology, albeit the functions are most often single-peaked curvilinear and vary across domains (Simonton, 2014b). William James was actually included among the "thinkers" in the latter study, obtaining a 2 on a 0-3 point scale, meaning that his psychopathology was "marked" rather than either "mild" or "severe" (Post, 1994). His score was close to average for thinkers in the sample (M = 1.91). Friedrich Nietzsche, in contrast, received a 3 = "severe."

[5]The paradoxical assertion "Random number generation is too important to be left to chance" sometimes shows up on T-shirts. The quote is the actual title of an article published in 1970 by Robert R. Coveyou, an expert in pseudo-random number generators (Niederreiter, 1978). The latter implement utterly deterministic methods to produce number sequences that for all practical purposes can be deemed random (e.g., for Monte Carlo simulations). The prowess of these computer algorithms proves that chance can be effectively simulated by determinism. That simulation is certainly sufficient to provide the basis for a BVSR combinatorial model that operates *as if* it were random (Simonton, 2010a). The causal chain connecting any sociocultural antecedents of the "great man" and the social selection of the "great thoughts" would still remain broken. The circumstances underlying initial idea generation are manifestly *decoupled* from those behind the idea's final preservation (Toulmin, 1981). Domino chain reactions end if some dominos are missing from the lineup—or if the two lines of dominos aren't even lined up.