Working Paper Series
No. 2016-28

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Three Myths

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December 2016

Keywords: creativity, innovation, aging, ageism

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Three Myths

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Abstract

This paper debunks three persistent myths: that creativity is greatest in youth, that wisdom hinders creativity, and that every discipline has a single peak age of creativity. These myths systematically neglect the achievements of *experimental* innovators – including such figures as Charles Darwin, Mark Twain, Paul Cézanne, Robert Frost, Virginia Woolf, Frank Lloyd Wright, and Alfred Hitchcock – who develop their work gradually over long periods to arrive at major contributions. Recent research has shown that experimental innovators are greatest late in life, that their wisdom increases their creativity, and that virtually every intellectual domain has great experimental old masters as well as conceptual young geniuses. In a society that devotes as much effort as ours to eliminating such pernicious forms of discrimination as racism and sexism, it is past time to recognize that these myths about creativity make a damaging contribution to ageism.

Age and Creativity

One of the most widespread and persistent myths about creativity is that it is primarily, or even exclusively, associated with youth. The stereotype of the brash and iconoclastic young genius as the dominant source of important innovations has long had a firm hold on the popular imagination. Thus in surveying popular attitudes toward aging, the psychologist Dean Simonton observed that "Most conspicuous is the notion that creativity is the prerogative of youth, that aging is synonymous with a decrement in the capacity for generating and accepting innovations."[1]

Nor is this misconception restricted to the general public. It is also shared by many scholars. One of its foundations is Harvey Lehman's *Age and Achievement*, published in 1953, which remains the most ambitious empirical investigation of this relationship ever done by a psychologist. Lehman measured the ages at which large numbers of practitioners of scores of different activities made important contributions to their disciplines. For each activity, he then aggregated these individual ages into a single statistical distribution. From inspection of the distributions he produced in this way, Lehman concluded that "the genius does not function equally well throughout the years of adulthood. Superior creativity rises relatively rapidly to a maximum which occurs usually in the thirties and then falls off slowly." He described what he called a "gerontic paradox," that "the old usually possess greater wisdom and erudition. These are invaluable assets. But when a situation requires a new way of looking at things, the acquisition of new techniques or even new vocabularies, the old seem stereotyped and rigid. To learn the new they often have to unlearn the old and that is twice as hard as learning without unlearning." Lehman conceded that "when a situation requires a store of past knowledge then the old find their advantage over the young," but he did not believe that these were occasions for creativity.[2]

Lehman's book remains basic to the study of creativity by psychologists. In 1994, Simonton called it "one of the most impressive research programs in the scientific study of achievement," and noted that Lehman's conclusions had not subsequently been contradicted.[3] Lehman's conclusion about age and creativity was in fact echoed by the psychologist Colin Martindale in 1989 who wrote, that "In general, a person's most creative work is done at a fairly early age," and by Simonton in 1990, that "creativity seems to peak in early to middle adulthood."[4]

Scholars outside psychology have also expressed similar beliefs. So for example the economist Paul Romer declared that "Young people, I think, tend to be more innovative, more willing to take risks, more willing to do things differently, and they may be very important, disproportionately important, in this innovation and growth process."[5] And the biological scientist Francis Collins, director of the National Institutes of Health, told a journalist that "One thing I've learned from being in science is that the researchers in the early stages of their careers tend to be the ones with the fire in the belly. They are not afraid of tackling the really hard problems."[6]

The bold leaps of fearless and iconoclastic young conceptual innovators are one important form of creativity. But they are not the only form. For equally demonstrated is the fact that there is another, very different type of creativity, in which important new discoveries emerge gradually and incrementally from the extended cautious explorations of older experimental innovators. Innovators who made major contributions at the age of 50 or above include Darwin, Twain, Cézanne, Rodin, Atget, Wright, Frost, Le Corbusier, Berlin, Ford, Hitchcock, Bishop, Gehry, and Yunus. Nor are these rare anomalies. So for example even a cursory survey of other great experimental innovators in some of the modern arts who made major contributions after 50 includes Camille Pissarro, Edgar Degas, Thomas Hardy, Claude Monet, Henry James, Joseph

Conrad, William Butler Yeats, Wassily Kandinsky, Marcel Proust, Piet Mondrian, Thomas Mann, Constanin Brancusi, Wallace Stevens, William Carlos Williams, Jerome Kern, Marianne Moore, Eugene O'Neill, Jean Renoir, Howard Hawks, Henry Moore, Richard Rodgers, Mark Rothko, Willem de Kooning, David Smith, Francis Bacon, Akira Kurosawa, Louise Bourgeois, Saul Bellow, Aleksandr Solzhenitsyn, Lucian Freud, Robert Altman, Clint Eastwood, John Updike, Philip Roth, and J.M. Coetzee. This list of artists could easily be multiplied many times over, and it could be expanded to include great scholars and entrepreneurs. But this is unnecessary. This list is more than sufficient to make the point that older experimental innovators have had an enormous impact on our art, and society.

It should be emphasized that this is no mere numbers game. The differences in the creative life cycles of experimental and conceptual innovators go far beyond simply differences in age, for they are based on differences in kind – differences in their goals, their methods, and in the very nature of their products. Lehman and the other psychologists who have studied the relationship between age and creativity have too often done so exclusively quantitatively and mechanically, counting and tabulating innovators and innovations. This methodology is not well suited to the study of creativity, for aggregate quantitative studies are most effective for the analysis of large, homogeneous populations. But there are not millions, or thousands, or perhaps even hundreds, of great innovators in a society in any generation. Great creativity is the province of small numbers of exceptional individuals, and they are far from homogeneous.

To reject the psychologists' aggregate quantitative exercises is definitely not to assert that there are no systematic patterns in creativity. Experimental innovators not only share a pattern of creativity over the life cycle, in which the power of their work increases throughout much or most of their adult lives, but their goals, their methods, and the nature of their work also share a basis –

in the concrete rather than the abstract, the real rather than the imaginary, and the uncertain rather than the certain. No understanding of creativity can be complete without recognizing both the quantitative and the qualitative similarities among innovation's late bloomers. It is this latter type of creativity that has been unduly ignored by both the general public and scholarly specialists. And it is consequently worth emphasizing the specific mechanisms that typically connect age with experimental creativity.

In 1904, in a letter to a younger friend, the 65-year-old Paul Cézanne assessed his own achievement:

> In your letter you speak of my realization in art. I believe that I attain it more every day, although a bit laboriously. Because, if the strong feeling for nature – and certainly I have that vividly – is the necessary basis for all artistic conception on which rests the grandeur and beauty of all future work, the knowledge of the means of expressing our emotion is no less essential, and is only to be acquired through very long experience.

A few months later, Cézanne wrote to Emile Bernard that "I progress very slowly, for nature reveals itself to me in very complex ways; and the progress needed is endless." The next year, Cézanne again wrote to Bernard that he believed he had made some progress, "rather slow," in his latest studies, then added, "It is, however, very painful to have to state that the improvement produced in the comprehension of nature from the point of view of the picture and the development of the means of expression is accompanied by old age and a weakening of the body."[7] These letters expressed Cézanne's conviction that above all two key elements – the acuity of his perception of his subject, and the development of a technique that would allow him to express that perception – were critical to the improvement of his art, as well as his belief that both of these elements could only be products of long and careful study. These letters also expressed his cautious judgment that he was making progress. Students of Cézanne's art have

agreed, as Roger Fry wrote of his "long research for an ultimate synthesis which unveils itself little by little from the contemplation of the things seen," and Meyer Schapiro declared that "the years from 1890 to his death in 1906 are a period of magnificent growth."[8]

Mark Twain emphasized that his fiction always grew out of things he knew directly—"life with which I am familiar"—so it is not surprising that he considered experience "an author's most valuable asset." For Twain, experience was what brought fiction to life, and it could only be the product of deep knowledge of a subject: "Almost the whole capital of the novelist is the slow accumulation of unconscious observation—absorption." This required time: "The life, the genius, the soul of a people are realized only through years of absorption." In addition to experience of life, the writer needed experience of his craft, which also required time: "Every man must *learn* his trade—not pick it up. God requires that he learn it by slow and painful processes. The apprentice hand in blacksmithing, in medicine, in literature, in everything, is a thing that can't be hidden."[9] The novelist Wright Morris compared Twain's growth to that of an experienced ship's captain, observing that he "learned to write the way a river pilot learns the feel of a channel."[10] T.S. Eliot recalled that reading *Tom Sawyer*—"a boys' book, and a very good one"—had not prepared him for *Huck Finn*, "the only one of Mark Twain's various books which can be called a masterpiece." He contended that Twain's growth in the years between the two books was not only in his skill in the use of language, but in his creation of the form of narrative: "We look at Tom as the smiling adult does: Huck we do not look at —we see the world through his eyes. The two boys are not merely different types; they were brought into existence by different processes." This produced a basic difference in the depth of characterization: "Huck's persisting admiration for Tom only exhibits more clearly to our eyes the unique qualities of the former and the commonplaceness of the latter." Twain's mature mastery of language allowed him to create Huck

consistently and convincingly: “there is no exaggeration of grammar or spelling or speech, there is no sentence or phrase to destroy the illusion that these are Huck’s own words.” Twain created Huck experimentally, for “*Huckleberry Finn* is not the kind of story in which the author knows, from the beginning, what is going to happen.” Twain’s experience, both of writing and of life growing up on the Mississippi, allowed him to give a simple boy a quality that made him one of fiction’s lasting characters: “Huck has not imagination, in the sense in which Tom has it: he has, instead, vision. He sees the real world; and he does not judge it—he allows it to judge itself.”[11]

Charles Darwin’s career was based on the conviction that theories should be the product of deep and detailed knowledge. At the age of 22, he accompanied a Cambridge geology professor on a field trip to Wales. Darwin was “utterly astonished” when the professor dismissed a single anomalous discovery as uninteresting, because of the absence of related evidence that the oddity was of real significance. This left a lasting impression: “Nothing before had ever made me thoroughly realize…that science consists in grouping facts so that general laws or conclusions may be drawn from them.”[12] Four decades later, at 62, Darwin gave a concise statement of his formula for creativity, in a letter congratulating his youngest son on passing a college exam. The boy was not a distinguished student, and Darwin could clearly identify with him. His encouragement to his son stressed that creativity did not depend solely on intelligence:

> I have been speculating last night what makes a man a discoverer of undiscovered things, and a most perplexing problem it is. Many men who are very clever – much cleverer than discoverers – never originate anything. As far as I can conjecture, the art consists in habitually searching for causes or meaning of everything that occurs. This implies sharp observation and requires as much knowledge as possible of the subject investigated.[13]

In a recent study of Darwin’s career, the geneticist Steve Jones emphasized the vast amount of evidence Darwin produced, and its powerful effects:

> His lifelong labors – six million words in nineteen published works, hundreds of scientific papers, and fourteen thousand letters – generated an archipelago of information, a set of connected observations that together form a harmonious whole. Biology emerged from that gargantuan effort as a unitary subject, linked by the great idea of common ancestry, of evolution. The volumes written in Down House made sense of a whole new science and enabled its students to navigate what had been an uncharted labyrinth of shoals, reefs and remote islets of apparently unrelated facts.

Jones contended that Darwin "became a better scientist as he grew older for he began to test ideas with experiments, many far ahead of their time, rather than collating the results of others, brilliant as the synthesis might be." [14] Antonello La Vergata observed that Darwin's intellectual ability itself developed over time: "Darwin students today generally agree that Darwin's theory was constructed, not discovered, and that it was the result of the evolution of a creative system: Darwin's mind."[15] This development gave Darwin an ever greater capacity to analyze his steadily accumulating body of evidence. In closing his autobiography, Darwin attributed his success as a scientist above all to "the love of science – unbounded patience in long reflecting over any subject – industry in observing and collecting facts – and a fair share of invention as well as of common-sense."[16]

The critic Harold Bloom contended that the uniqueness of Shakespeare's genius was in peopling a world with "men, women, and children preternaturally natural. Cervantes rivals him with two giant personalities, Don Quixote and Sancho Panza, but Shakespeare has hundreds." [17] Shakespeare was an experimental innovator, whose artistic development was gradual; Stephen Greenblatt observed that his achievement was "not a sudden, definitive innovation, but the subtle refinement of a particular set of representational techniques."[18] Virginia Woolf studied Shakespeare's plays to understand his stylistic concision, marveling at his ability to reveal "a whole character packed in a little phrase."[19] T.S. Eliot considered Shakespeare the greatest of

poets and dramatists, and studied his work from an early age (when Eliot was 16, his mother wrote to the headmaster of Milton Academy that "He has read practically all of Shakespeare, whom he admires, and retains much in memory").[20] Eliot never stopped pondering the nature of Shakespeare's artistic development. He made references to it over a span of at least 35 years, as Shakespeare's example became a focal point for Eliot's consideration of the relationship between age and creativity. Eliot marveled at the "slow, continuous development of mastery of his craft of verse," that never ceased: "To the last Shakespeare is inexhaustible. Whatever he did was new."[21] He stressed the significance of the whole process of Shakespeare's growth and maturation, "in which the choice both of theme and of dramatic and verse technique in each play seems to be determined increasingly … by the particular stage of his emotional maturity at the time." This produced an overall unity in his work, "so that we may say confidently that the full meaning of any one of his plays is not in itself alone, but in that play in the order in which it was written, in its relation to all of Shakespeare's other plays, earlier and later." Shakespeare's integral development became an artistic touchstone for Eliot: "the measure in which dramatists and poets approximate to this unity in a lifetime's work is one of the measures of major poetry and drama."[22]

Eliot contrasted Shakespeare's creative life cycle to that of a transgressive young genius who was his exact contemporary:

> We can also observe…that the plays of Christopher Marlowe exhibit a greater maturity of mind and of style, than the plays which Shakespeare wrote at the same age: it is interesting to speculate whether, if Marlowe had lived as long as Shakespeare, his development would have continued at the same pace. I doubt it: for we observe some minds maturing earlier than others, and we observe that those which mature very early do not always develop very far.[23]

Eliot thus recognized the difference between the life cycles of conceptual and experimental poets. Reflecting on the quality of maturity, Eliot remarked that Shakespeare's greatness not only grew as the writer aged, but became more apparent to the reader as he himself aged: "No reader of Shakespeare…can fail to recognize, increasingly as he himself grows up, the gradual ripening of Shakespeare's mind."[24] In his last public lecture, at 73, Eliot remarked that "So great is Shakespeare…that a lifetime is hardly enough for growing up to appreciate him," and in one of his last essays he declared that "of Shakespeare, the development of one's opinions may be the measure of one's development in wisdom."[25] The extended and gradual development of the experimental Shakespeare was puzzling to the conceptual Eliot, whose own life cycle of creativity followed a very different path, and the subject may have been an uncomfortable one in view of Eliot's awareness of his own diminishing creativity. But Eliot was too perceptive a reader not to recognize the growth of Shakespeare's art over the course of his life, and too principled a critic not to consider the ways in which his creativity grew with age.

The photographer and critic Jerry Thompson contended that under just the right circumstances, a photographer would learn from the world at the same time that his skill at finding pictures grew, and that the results of this relationship between the photographer and his subject would be greatest for the most patient and watchful artists. His prime example of this process was the investigation of old Paris by Eugène Atget. Thompson noted that over time, Atget often returned to the same locations again and again: "The pictures do not change greatly in their visual appearance, but as the years pass they become deeper, richer, more charged with meaning, and more suggestive of strong emotion." In Atget's late works, his camera was often farther back, "as if the aging photographer, having studied texture and close detail for so long, is now consistently able to take in longer views with the same degree of mastery." Thompson believed

that this mastery was a product not only of Atget's growing skill at composition, in understanding how forms and light would appear in a picture, but also of his growing receptivity to his subject: "His great experience of looking at the same things for so long has combined in a deep way with the age he has attained, age resulting from a long life whose main energies were spent in this very looking."[26]

Late in his life, the literary scholar David Kalstone set out to write a book about the generation of American poets who came of age after World War II, but as he worked, Elizabeth Bishop "eventually took over my book." The manuscript he left unfinished when he died was about "the steady growth of an extraordinary mind."[27] Kalstone was not alone in becoming captivated by the process of Bishop's artistic maturation. The poet Thom Gunn recalled that when he first met Bishop, he felt that there was a depth in her personally that had not gotten into her poetry, but that when he read *Geography III*, the last of her books published in her lifetime, "all at once everything was changed…It was only ten poems long, and yet its achievement was such that it retrospectively altered the emphasis and shape of an entire career."[28] Thomas Travisano pointed to qualities of Bishop's work that appear to have been subject to development over time. Her idiomatic language and conversational voice grew more relaxed. Her understated treatment of small details of everyday life grew subtler. The timing of her poems increasingly worked to allow images to emerge gradually, as if the poem were being composed even as the reader examined it. The tone of her writing became progressively more elegiac, so that even her most personal poems were not confessional in the standard sense of that term: her meditations dealt not only with personal loss, but with the universality of loss. She elevated humble and overlooked subjects, finding "[a]mongst the discarded and ignored…examples of integrity, dignity, courage, humor, and grace."[29] These qualities made Bishop's late poetry an inspiration to Gunn and other young

poets who wanted to make their art from careful observation of life. Bishop had a profoundly experimental distrust of theorizing about poetry. But late in her life, in a letter to a literary scholar she came close to a generalization about why art might grow with the accumulation of knowledge and experience: "Well, it takes an infinite number of things coming together, forgotten, or almost forgotten, books, last night's dream, experiences past and present—to make a poem."[30]

Harvey Lehman and a number of later psychologists have assumed that the accumulation of knowledge serves only to reduce the flexibility, and consequently the creativity, of the old. Greater knowledge, and associated entrenched habits of thought, do appear to constrain conceptual innovation, for they create barriers to the extreme simplifications that often characterize conceptual creativity (see, for example, George Martin's judgment that Paul McCartney's lack of formal training in music gave him the freedom to make outrageous innovations), and they tend to erode the innocent and brash self-confidence of the cocksure young prodigy who can make bold leaps into the unknown because he is not yet aware of, and intimidated by, the complexity of his discipline (when the 50-year old Orson Welles was asked how he had arrived at the innovations in *Citizen Kane*, he replied "I owe it to my ignorance. If this word seems inadequate to you, replace it with innocence").[31]

But the recipe for experimental innovation is very different. Great experimental innovators develop not only vast stores of knowledge about their chosen area—"as much knowledge as possible of the subject investigated," in Darwin's words – but also the technical means by which to turn it into a novel contribution – Cézanne's "knowledge of the means of expressing." Both the accumulation of great knowledge and the construction of new technical means are "only to be acquired through very long experience," in Cézanne's words, and this implies that their greatest results will almost always appear late in a career. In the presence of appropriate technical

expertise, greater knowledge affords the experimental innovator a larger and more trustworthy foundation for generalizations, to support broader and more far-reaching conclusions. A key contributing factor is that great experimental innovators, like Cézanne, Darwin, Shakespeare, and Bishop, are often "inexhaustible," never lose their fascination with their chosen discipline, and consequently never cease developing intellectually.

It is difficult to understand how the scholars cited earlier could so completely overlook the existence of experimental creativity. Their failure may stem from several mistaken assumptions. One, noted above, is that of homogeneity – that all innovators in any given activity share a single pattern of creativity over the life cycle, because their methods and goals are all the same. Another is suggested by Lehman's comment, quoted above, that older practitioners are hindered by the inability to rid themselves of habits of thought – "To learn the new they often have to unlearn the old." This appears to assume that innovators must depart from existing practices at the time they produce their own novel contributions. In fact, however, experimental innovators typically reject existing practices long before they arrive at new forms to replace them. Cézanne, Darwin, Frost, Bishop, and many others were not in the position of having to break away from traditional approaches late in their lives, for they had instead done this quite early, then spent long periods constructing and refining the new approaches that would become their contributions.

In dismissing increasing age as a source of creativity, Lehman and the scholars who have followed him in this error were guilty of mistaking a part of creativity for the whole. Old age and experience may be lethal to the creativity of the conceptual young genius, but they are the lifeblood of the innovations of experimental old masters. This analysis would come as no surprise to Paul Cézanne, Charles Darwin, Mark Twain, Elizabeth Bishop, or any other great experimental innovator. Among the latter was Louise Bourgeois, a great experimental sculptor, who once

declared “I am a long-distance runner. It takes me years and years and years to produce what I do.”[32] Bourgeois made her greatest work after the age of 80.[33] When she was 84, and an interviewer asked whether she could have made one of her recent works earlier in her career, she replied, “Absolutely not.” When he asked why, she explained, “I was not sophisticated enough.”[34]

Wisdom and Creativity

The myth that wisdom hinders creativity is effectively a corollary to the belief that increasing age is detrimental to creativity, and has been promoted by many of the same scholars. As noted above, Harvey Lehman recognized that “the old usually possess greater wisdom and erudition,” but he contended that these were accompanied by a rigidity that made them ineffective in situations that require “a new way of looking at things, the acquisition of new techniques, or even new vocabularies.”[35] In 1990, Dean Simonton wrote that “Creativity and wisdom are frequently viewed as exhibiting contrary relations with aging: where the former is viewed as a privilege of youth, the latter is seen as a prerogative of old age. Empirical research on longitudinal changes in both personal assets appear to support this commonplace perception.”[36] And in 2003, the psychologist Robert Sternberg observed that “the kinds of thinking required to be creative and wise are different.” He believed that the wise lacked a key attribute of creativity: “Creative thinking is often brash whereas wise thinking is balanced.” Wisdom and creativity had opposing bases: “Whereas the wise person is perceived to be a conserver of worldly experience, the creative person is perceived to be a defier of such experience.”[37]

As in their analysis of the relationship between age and creativity, the fundamental error of these psychologists is their implicit belief that all creativity is conceptual. This is evidenced by Sternberg’s characterization of creative thinking as brash, rather than balanced. In fact, however,

creative thinking can be balanced, measured, and judicious, and important experimental innovators generally benefit from considerable wisdom.

Great experimental innovators crucially come to understand how they themselves learn. They recognize that whereas conceptual innovators progress by sudden leaps, based on abstraction and deduction, they themselves are empiricists, who learn inductively by gradually accumulating knowledge, often primarily from their own experiments. This recognition is key for turning expertise into wisdom, and ultimately into innovation. Experimental innovators' dissatisfaction with their inability to achieve their distant and indistinct goals spurs them to change their work, cautiously and tentatively but persistently. And a key for making these changes into a cumulative evolution is the ability to separate successful experiments from failures: this capacity for self-criticism is what enables them to make their trial-and-error methods the basis for sustained improvement in their work over time. Thus judgment is a central element of wisdom.

Robert Frost believed that a poem "begins in delight and ends in wisdom."[38] Experience was essential for the poet: "Practice of an art is more salutary than talk about it." He never wrote poems merely as an exercise – "I always extended for the best yet" – but even unsuccessful efforts made a contribution, for "what I failed with I learned to charge up to practice after the fact."[39] In a letter of 1915, the 41-year-old Frost considered the maturation of his artistic interests. He recalled that for a decade beginning at the age of 18, "I thought I greatly preferred stocks and stones to people." This was a period in which "my conscious interest in people was at first no more than an almost technical interest in their speech." Then he came to a realization: "There came a day about ten years ago when I made the discovery that though sequestered I wasn't living without reference to other people. Right on top of that I made the discovery in doing The Death of

The Hired Man that I was interested in neighbors for more than merely their tones of speech – and always had been." He enjoyed the small talk of his neighbors: "I like the actuality of gossip, the intimacy of it." And he understood that this was the essence of poetry: "effects of actuality and intimacy are the greatest aim an artist can have. The sense of intimacy gives the thrill of sincerity."[40]

The scholar Tim Kendall noted that "The Death of the Hired Man," which Frost wrote at 41, was probably the first successful application of Frost's theory of the "sound of sense" – an abstract effect that Frost said could best be gotten "from voices behind a door that cuts off the words."[41] The poem's most famous passage was the culmination of a debate between a husband and wife in which she countered his mocking and sarcastic definition of home with a more generous and tolerant one:

> "Home is the place where, when you have to go there,
> They have to take you in."
>
> "I should have called it
> Something you somehow haven't to deserve."[42]

The central theme of the poem was the process by which the wife gently but persistently overcame the stubbornness of the husband, and it marked Frost's shift "into poetry as a drama of everyday lives."[43] The critic Edward Garnett praised its dialogue for its "exquisite precision of psychological insight."[44] Frost's mature poetry captured the subtlety and nuance of the speech of three-dimensional characters because it was based on a deep understanding of people as individuals. This followed from Frost's conviction that "a real poet" was one who noticed those "shades of character which are harder to see."[45]

Robert Frost's true subject was not the language of New England, but its people: thus he wrote of himself in 1933, "The country and nature in New England have been his background, but

the poems are almost without exception portraits of people."[46] Randall Jarrell explained that Frost's "wonderful dramatic monologues or dramatic scenes come out of a knowledge of people that few poets have had, and they are written in a verse that uses, sometimes with absolute mastery, the rhythms of actual speech." The combination of Frost's deep knowledge of his subject and subtle mastery of his technique made his reader feel "that he is not in a book but a world, and a world that has in common with his own some of the things that are most important in both."[47] To Frost, the knowledge of his subject and the technical means of its expression could not be separated, for the form of art had no merit independent of its content. Both were the product of knowledge that poets could neither gain solely in libraries nor acquire deliberately, but comprised "what will stick to them like burrs where they walk in the fields."[48] This knowledge, compounded from a blend of experience and judgment, was Frost's most highly prized possession. As he wrote in his notebook, "I had rather be wise than artistic."[49] What mattered in art above all was not its form but its content, as late in his life he reflected that "All there is to learning to write or talk is learning how to have something to say."[50]

In a memorial lecture for William Butler Yeats, T. S. Eliot marveled at the sustained development of Yeats' art throughout his long career. Eliot explained that Yeats had grown from a great craftsman into a great poet, "who, out of intense and personal experience, is able to express a general truth; retaining all the particularity of his experience, to make of it a general symbol." Yeats' early work was necessary for the late: "he had to wait for a later maturity to find expression of early experience." The transition from one to the other was not discrete, but continuous, with the growth of judgment: "It is not that he became a different man, for, as I have hinted, one feels sure that the intense experience of youth had been lived through –and indeed, without this early experience he could never have attained anything of the wisdom which appears

in his later writing."[51] The poet Donald Hall stressed that it was Yeats' skill in judging his own writing that allowed this development: "It is this twin ability –first to see the failure of his own work, then to use that failure as a starting point for new work –which makes Yeats the greatest model for another poet."[52]

At the age of 46, Virginia Woolf wrote that "Every secret of a writer's soul, every experience of his life, every quality of his mind is written large in his works." Her biographer Lyndall Gordon commented that this was a deliberate extravagance, but that "in her case, nothing is so true as her fiction to her most cherished experience."[53] Few writers can have devoted more time and effort than Woolf to understanding their discipline and honing their skills. She read and wrote voraciously. In addition to her nine novels, she wrote hundreds of essays and reviews, nearly 4,000 letters, and 26 volumes of a diary.[54] A biographer noted that she "wrote every day for about thirty-five years."[55] After Woolf's death, her husband wrote that her diaries "show the extraordinary energy, persistence, and concentration with which she devoted herself to the art of writing and the undeviating conscientiousness with which she wrote and rewrote and again rewrote her books."[56] Woolf herself had written in her journal that "in this book I practice writing; do my scales; yes and work at certain effects… [T]he diary writing has greatly helped my style; loosened the ligatures."[57] Woolf came to realize that for her writing was not only a pleasure, but a necessity, recording in her diary at the age of 51 an insight into "the synthesis of my being: how only writing composes it: how nothing makes a whole unless I am writing."[58] Writing was her calling: "I feel that by writing I am doing what is far more necessary than anything else."[59]

When Woolf was not writing, her primary activity was talking with her remarkable circle of friends. The famous Bloomsbury group was intellectually diverse – it included writers, poets, artists, critics, and scholars – but an occasional guest, the writer William Plomer, observed that

Woolf's friends shared one common denominator: "their power of being articulate." A number of such visitors recorded memories of their impressions of Woolf in her salon. Virtually all described her as formidable – brilliant, beautiful, articulate, charming – but many also saw her studying as she socialized. The poet John Lehmann remembered her always asking questions: "her curiosity about people was immense." The biographer David Cecil remembered Woolf as an "extraordinarily unegotistic talker. She seemed much more interested in what other people said than in what she said herself. She questioned one a lot and seemed intensely interested in the answers." The novelist Elizabeth Bowen emphasized that "she wanted to know all the details of other people's lives," and the artist Barbara Bagenal recalled that "she really wanted to understand everyone's mind and thoughts." The writer Nigel Nicolson explained that "no human experience was considered by her too trivial to be interesting and she stored it away in the back of her mind," perhaps "to come out years later in some totally changed way in one of her books."[60] Woolf's famous social circle was thus not only a source of erudite entertainment for its sophisticated members, but also a laboratory in which Woolf relentlessly accumulated knowledge about her central subject, the refined and educated residents of London in the 1920s.

Woolf's single-minded goal was always to become a better writer, and many critics have remarked on her progress in this over time. So for example in 1929 the writer Raymond Mortimer declared that Woolf had a Midas touch: "every object she touches becomes iridescent, every word she uses is alive and pulling like a trout on a line." He observed that her style was "the result of years of experience. We can see it developing as we follow the chronological order of her works. But this long apprenticeship has left her a complete mistress of her medium. Her line, like a great painter's, is now spontaneously artful."[61]

Woolf never wrote at length about the process by which she had trained herself, but her essays contain occasional comments about writers, and writing, that appear to have been based on introspection as well as observation. One of her recurring themes was that formal education was only part of a writer's training. Late in her life, in an essay surveying the development of the English novel, she remarked that "a writer's education is so much less definite than other educations. Reading, listening, talking, travel, leisure – many different things it seems are mixed together. Life and books must be shaken and taken in the right proportions."[62] Earlier, Woolf had reviewed a volume of the letters of Henry James, one of her literary models.[63] She related James' artistic process to the trajectory of his art: "If we look upon many of these early pages as experiments in the art of writing by one whose standard of taste exacts that small things must be done perfectly before big things are even attempted, we shall understand that their perfection is of the inexpressive kind that often precedes a late maturity." Later in the essay she returned to this subject: "A spectator, alert, aloof, endlessly interested, endlessly observant, Henry James undoubtedly was; but as obviously, though not so simply, the long-drawn process of adjustment and preparation was from first to last controlled and manipulated by a purpose which, as the years went by, only dealt more powerfully and completely with the treasures of a more complex sensibility." The confidence of her understanding is likely to have stemmed from Woolf's recognition of her kinship with James as a fellow experimental novelist. The same is true of the reticence she shared with James, and her insight into his refusal to explain his underlying concerns to uncomprehending critics: "Scarcely for a moment does Henry James talk of his writing; never for an instant is the thought of it absent from his mind…[E]ach book is a step onward in a gradual process of evolution, the plan of which is known only to the author himself. He remains inscrutable, silent, and assured."[64]

An apparent glimpse of Woolf's analysis of her own career comes from her counterfactual reflections on the likely development of another illustrious predecessor. In 1923, in an essay originally titled "Jane Austen at Sixty," the 41-year old Woolf wrote about a great novelist who had died at the age of 42.[65] Woolf declared that "She died at the height of her powers. She was still subject to those changes which often make the final period of a writer's career the most interesting of all." In closing, she speculated about how Austen's work would have changed had she lived longer. Woolf was confident that Austen would not have made any radical changes, but would have remained devoted to her craft: "She would not have written of crime, of passion, or of adventure. She would not have been rushed by the importunity of publishers or the flattery of friends into slovenliness or insincerity." But Woolf was equally confident that Austen would have improved her art, in specific ways:

> [S]he would have known more. Her sense of security would have been shaken…she would have trusted less…to dialogue and more to reflection to give us a knowledge of her characters. Those marvelous little speeches which sum up, in a few minutes' chatter, all that we need in order to know an Admiral Croft or a Mrs. Musgrove for ever, that shorthand, hit-or-miss method which contains chapters of analysis and psychology, would have become too crude to hold all that she perceived of the complexity of human nature. She would have devised a method, clear and composed as ever, but deeper and more suggestive, for conveying not only what people say, but what they leave unsaid; not only what they are, but what life is. She would have stood farther away from her characters, and seen them more as a group, less as individuals…She would have been the forerunner of Henry James and of Proust…[66]

- and, clearly, of Virginia Woolf, in this procession of great modern experimental novelists.[67] The precision of Woolf's analysis of the hypothetical development of Austen points to the likelihood that Woolf was drawing from her agenda for her own future work. Woolf projected onto Austen her own perennial desire to gain deeper knowledge of her characters and to devise better technical means of presenting that knowledge.

One of Woolf's closest friends, the novelist E.M. Forster, wrote that "she respected and acquired knowledge, she believed in wisdom." He observed that she "had a singleness of purpose which will not recur in this country for many years." Forster understood that Woolf's constant application was a product of her love for her art, as he commented that "She liked writing with an intensity which few writers have attained or even desired."[68] By the 1920s, Woolf knew that she had gained wisdom as a writer, through her constant dedication to a single goal. She recognized that Austen, James, and Proust were great experimental writers who had also gained wisdom, by working tirelessly and single-mindedly to improve the quality of their art as they grew older. While writing *Mrs. Dalloway*, at 43, she entertained the possibility that "I might become one of the interesting – I will not say great – but interesting novelists," and her own convictions may have appeared in the mind of one of her characters:

> The compensation of growing old, Peter Walsh thought, coming out of Regent's Park, and holding his hat in hand, was simply this; that the passions remain as strong as ever, but one has gained – at last! – the power which adds the supreme flavor to existence – the power of taking hold of experience, of turning it round, slowly, in the light.[69]

The triumphant exclamation point emphasizing "at last" may have expressed Woolf's celebration of her own hard-won powers, and this suspicion is reinforced by her characteristic qualification of this joy almost immediately thereafter: "A whole lifetime was too short, now that one had acquired the power, the full flavor; to extract every ounce, every shade of meaning…"[70]

In his autobiography, Charles Darwin wrote that it was during his time on the *Beagle* that he acquired "the habit of energetic industry and of concentrated attention to whatever I was engaged in…Everything about which I thought or read was made to bear directly on what I had seen and was likely to see." With characteristic modesty, he reflected that "I feel sure that it was this training which has enabled me to do whatever I have done in science." Considering the

development of his abilities over time, he wrote that "I think that have become a little more skillful in guessing right explanations and in devising experimental tests; but this may probably be the result of mere practice, and a larger store of knowledge."[71] Michael Ghiselin commented of Darwin that "Perhaps we should attribute his accomplishment less to intelligence than to wisdom," noting that Darwin sought "to gain wisdom through reflecting upon his experience, and was very careful to learn from his mistakes." Ghiselin argued that Darwin's achievement was the result of a combination of courage, ability, audacity, and one other crucial element: "To accomplish his great feats of intellect, Darwin needed a remarkable talent for judging the appropriate."[72]

Darwin stands high among a large class of scholars who have devoted long periods, often entire careers, to the study of a single subject. The greatest innovators in this class are those, like Darwin, who have produced powerful generalizations based on their vast accumulated knowledge. These innovators have had great wisdom, in their judgment of the limits of the generalizations that are warranted by the evidence, and in the ability to separate their own successful experiments from their failures, building on the former, and discarding the latter.

At the age of 71, Frank Lloyd Wright declared that every one of his more than 200 buildings had been "an honest experiment." He believed he was always making progress: "I am always building, professedly and openly out of my own experience better buildings with truer economy."[73] At 90, in a book he titled *A Testament,* he included a short section on "Wisdom," and reflected that "I have learned about architecture by root, by world-wide travel and by incessant experiment and experience in the study of nature."[74]

Not only the general public, but also many academic experts on creativity, have assumed that major innovations are necessarily the result of discrete bold and dramatic actions. This is a

mistake. The sudden leaps of conceptual innovators certainly can yield radical new results. But major innovations can equally be achieved through the gradual and incremental procedures of experimental innovators. Robert Frost's poetry, Virginia Woolf's fiction, Charles Darwin's theory of evolution, Frank Lloyd Wright's architecture, and many other great experimental contributions are among the most important developments in modern art and science, and all were the result of decades of experimentation. All of these depended on the wisdom of a great innovator, who had the patience, determination, and judgment to make sustained progress toward a distant goal over long periods, by taking countless small steps. And all are prime examples of the wise and balanced thinking that Robert Sternberg wrongly rejected as a correlate of creativity: brash thinking is characteristic of conceptual innovators, but balanced thinking is generally the very source of creativity for their older experimental counterparts. As in the preceding section, the last word can be provided by Louise Bourgeois, at age 84. When an interviewer asked whether she always felt the impetus to do something different, she objected, "No, not different! Better!" How was this possible? "You become better, which is… the wisdom of the elders."[75]

Revolutions and Evolutions

One reason why creativity is often incorrectly assumed to be restricted to conceptual innovation, and experimental innovation is overlooked, is that there is frequently a great difference in how conspicuously the two types of innovation arrive. Conceptual innovations often appear dramatically and suddenly, whereas experimental innovations typically arrive gradually and almost imperceptibly.

Conceptual innovations are often formulated and introduced suddenly and completely, and can consequently have an immediate revolutionary impact. Thus William Carlos Williams lamented that T.S. Eliot's *Waste Land* "wiped out our world as if an atomic bomb had been dropped upon it." When *Citizen Kane* opened in Paris in 1946, after the end of World War II, 14-year-old François Truffaut, who had already dropped out of school, instantly knew he had found his calling: "When I first saw *Citizen Kane*, I was certain that never in my life had I loved a person the way I loved that film."[76] When the young director Bernardo Bertolucci first saw Jean-Luc Godard's *Breathless*, he "had the feeling that something was starting from zero," and when he was introduced to Godard, "I was so emotional that I almost fainted."[77] When Sylvia Plath's late poems were published in 1965, the critic A. Alvarez wrote that these could not have been predicted from her earlier work, "because such a leap into originality is always unforeseeable."[78] Within just months, the critic George Steiner observed that the *Ariel* poems "have already passed into legend."[79] Bruce Springsteen recalled that "when I was fifteen and I heard 'Like a Rolling Stone,' I heard a guy who had the guts to take on the whole world and who made me feel like I had to, too."[80] When *Sgt. Pepper* was released in 1967, the critic Kenneth Tynan declared in *The Times* that it was "a decisive moment in the history of Western civilization."[81] And the physicist Paul Dirac wrote of the impact of Einstein's general theory of relativity, "I can't describe it by other words than by saying that it just *burst* upon us. It was a new idea, a new kind of philosophy, and it aroused interest and excitement in everyone."[82]

The drama of these innovations was heightened by the youth of their creators: Eliot was 34 when he published *The Waste Land*, Welles 26 when he made *Citizen Kane*, Godard 30 when he made *Breathless*, Plath 30 when she wrote the *Ariel* poems, Dylan 24 when he wrote "Like a Rolling Stone," and Einstein 36 when he completed the general theory. Other examples of

dramatic conceptual innovations include *Les Demoiselles d'Avignon*, that Picasso painted at 26; *Spiral Jetty*, that Robert Smithson constructed at 32; the Vietnam Veterans Memorial, that was completed when Maya Lin was 22; and the Apple II, that Steve Jobs launched when he was 22. Nor does this come close to exhausting the list of radical conceptual modern innovations that had a powerful and immediate impact on their disciplines. Even a short list would include the poem "Le Bateau Ivre," that Arthur Rimbaud wrote at 17; the play *Ubu Roi*, first performed when Alfred Jarry was 23; the ballet *The Rite of Spring*, first performed when Igor Stravinsky was 31; *Ulysses*, published on James Joyce's fortieth birthday; *The Great Gatsby*, published when F. Scott Fitzgerald was 29; and *The Catcher in the Rye*, published when J.D. Salinger was 32. This list could be expanded greatly, with bombshells made by young conceptual innovators not only in the arts but also in many other activities.

These conceptual innovations exploded on practitioners of their disciplines, and caused sudden radical changes in the way many of those practitioners worked. In many cases, the clarity of their innovative ideas made it possible for other practitioners to understand and adopt their approaches almost immediately. So for example Raoul Dufy recalled his sudden conversion to Fauvism upon first seeing Henri Matisse's masterpiece *Luxe, calme et volupté* in 1905: "It was for me the greatest revelation. I understood instantly the mechanics of the new painting."[83] Comparable individual landmark innovations are rarer among experimental innovators. The *Origin of Species* and *Adventures of Huckleberry Finn* had an enormous impact on their disciplines and beyond; Fallingwater and Notre Dame du Haut had a profound impact on architects; and *Vertigo* influenced many filmmakers. But these were innovations of a different kind, derived from lifetimes of work: Darwin and Twain published their masterpieces at 50,

Wright was 70 when he completed Fallingwater, Le Corbusier 63 when he completed the chapel at Ronchamp, and Hitchcock 59 when he directed *Vertigo.*

Many great experimental innovators have made no individual landmark works, because the careers of experimental innovators typically display continuity, with no sudden leaps or discrete discoveries. Scholars who have studied Cézanne's career have invariably been struck by the deliberateness of his approach to his art, both in making individual works and in pursuing his elusive goal of "realization." Meyer Schapiro observed that exploration was intrinsic to every effort Cézanne made: "Cézanne's method was not a foreseen goal which, once reached, permitted him to create masterpieces easily. His art is a model of steadfast searching and growth." Cézanne's construction of his paintings was tentative and cautious because of his uncertainty. Doubting the real possibility of final resolution, he developed a visual means of representing his doubt: "The qualities of the represented things, simple as they appear, are effected by means which make us conscious of the artist's sensations and meditative process of work…The marvel of Cézanne's classicism is that he is able to make his sensing, probing, doubting, finding activity a visible part of the painting." He never ceased to explore: "he never becomes settled in his art."[84]

Clive Bell recognized that "Cézanne's consciousness of the impossibility of realizing completely his conceptions – his consciousness, rather, that he had not completely realized them – made him regard all his pictures as unfinished." This was the source of his attitude toward his works, not as finished products, but as studies:

> Every picture carried him a little further towards his goal – complete expression; and because it was not the making of pictures but the expression of his sense of the significance of form that he cared about, he lost interest in his work so soon as he had made it express as much as he had grasped. His own pictures were for Cézanne nothing but rungs in a ladder at the top of which would be complete expression. The whole of his later life was a climbing towards an ideal. For him every picture was a means, a step, a stick, a hold, a stepping-stone – something he was ready to discard

> as soon as it had served his purpose. He had no use for his own pictures. To him they were mere experiments.[85]

Cézanne's quest did not begin at the start of his career. Thus after describing the development of Cézanne's art, Roger Fry immediately added that "it is necessary to explain that all this refers to Cézanne in the plenitude of his development, after many years of research, after the failure of many attempts in different directions – to Cézanne when he had discovered his own personality. Hardly anything of what has been said above would be true of Cézanne in his youth."[86] Great experimental artists make their greatest work late in their careers not only because their development is gradual, but often also because their real artistic evolution is delayed. Cézanne set out to become a painter of nature only from the time he spent studying with Pissarro near Paris, when he had already passed the age of 30. Mark Twain did not write his first novel until he was 38, and Robert Frost did not publish his first book of poetry until he was 39. Virginia Woolf did not publish her first novel until she was 33, and had spent a decade in self-imposed apprenticeship, publishing essays and reviews (she once told a younger writer that no one should publish before the age of 30: "Write till then, but scrap it or put it aside.").[87] These innovators not only did not believe in sudden breakthroughs, but distrusted the products of inexperienced artists.

Orson Welles was a flamboyant showman: the critic Andrew Sarris observed that "every Welles film is designed around the massive presence of the artist as autobiographer. Call him Hearst or Falstaff, Macbeth or Othello, Quinlan or Arkadin, he is always at least partially himself, ironic, bombastic, pathetic, and, above all, presumptuous. The Wellesian cinema is the cinema of magic and marvels, and everything, and especially its prime protagonist, is larger than life." At 26, Welles created one of the most deliberately and manifestly revolutionary works in the history of the modern arts, filled with technical innovations that startled and surprised viewers. In contrast, Sarris observed that in spite of the fact that Alfred Hitchcock was "the supreme

technician of the American cinema," the subtlety of his technique often caused it to be overlooked by critics and scholars. Nonetheless, Sarris maintained that "Hitchcock's art will always delight the specialist because so much of it is rendered with an air of casualness."[88] The unobtrusiveness of Hitchcock's technique was not accidental, but was characteristic of a great experimental innovator for whom a primary goal was to subordinate form to content. Thus Hitchcock maintained that "Technique that calls itself to the audience's attention is poor technique. The mark of good technique is that it is unnoticed."[89]

In 1988, Bruce Springsteen thought back 23 years, to when he was 16:

> The first time I heard Bob Dylan, I was in the car with my mother listening to WMCA and on came that snare shot that sounded like somebody had kicked open the door to your mind—"Like a Rolling Stone." My mother—she was no stiff with rock and roll, she liked the music—sat there for a minute, then looked at me and said, "That guy can't sing." But I knew she was wrong. I sat there and I didn't say nothing but I knew that I was listening to the toughest voice that I had ever heard. It was lean and it sounded somehow simultaneously young and adult.

Springsteen explained that Dylan had expanded the scope of popular music: "He had the vision and the talent to make a pop song that contained the whole world. He invented a new way a pop singer could sound, broke through the limitations of what a recording artist could achieve, and changed the face of rock and roll forever."[90] Gerry Goffin and Carole King had written more than 100 hits for American and English pop singers and groups in the early '60s, but in 2001 Goffin recalled that with "Like a Rolling Stone," "Dylan managed to do something that none of us was able to do: put poetry in rock 'n' roll, and just stand up there like a mensch and sing it. And Carole felt the same way too…so we took all the [demos of] songs that hadn't been placed…and smashed them in half. We said, we gotta grow up, we gotta start writing better songs now."[91]

Frank Gehry often speaks of *evolution* in describing how he designs buildings. So for example he explains that in working with models, "I move a wall, I move a piece of paper, and I

look at it – and it evolves." The process of discovery is visual, because the goal is aesthetic. Thus he recalled designing the Guggenheim: "When I drew the plan of Bilbao I was so happy, because I realized that it was a beautiful thing…It just evolved. I didn't consciously do it, but it intuitively evolved."[92] Thomas Krens, the director of the Guggenheim who commissioned Gehry, observed that whereas many architects resist any changes to their designs, Gehry never had qualms about starting over, because "he understands … that to do it a second time, and a third, he acquires knowledge of the problem, and the potential solutions tend to become cumulative. It gets better each time."[93] Gehry has explained that his work must develop gradually: "I always say if I knew in advance where I was going, I wouldn't go there. So I'm constantly letting things evolve." Not knowing where he wants to go, he is never certain whether he has arrived: "I always feel precarious. I don't feel like my work is resolved. It's intuitive and I don't have a road map…I'm trying to solve something and arrive somewhere so I am never in a state of being finished."[94]

Gehry has spoken of developing a personal language, and has compared his process to that of a great experimental sculptor: "If you look at Michaelangelo's *Slaves*, you realize how he carved into the stone searching for the answer, and when I draw, it's a lot like that. I'm looking for the idea. It's hand-to-eye coordination, but it's also intuition. It has the training of the language you've evolved."[95] When Gehry discussed the architect's life cycle in an interview, the examples he cited were exclusively experimental innovators, who were great late in their careers: "It takes a long time … for you to develop a unique language … So by the time you get there, you're in your late fifties or sixties. And that's the tradition. Louis Kahn didn't get anything until he was in his late fifties. I think Frank Lloyd Wright was the same. Corbusier. Mies van der Rohe. It's just a profession that peaks later."[96] (In fact, however, it is only experimental architects – the visual architects Gehry most admires – who peak late. Omitted from his generalization were such

important conceptual architects as Walter Gropius, who gained fame at the age of 30 for his design of the Fagus Factory; Renzo Piano and Richard Rogers, who jointly designed the sensational Pompidou Center at 30 and 34, respectively; or Maya Lin, who designed the radical Vietnam Veterans Memorial at 22.) Critics have remarked on Gehry's extended artistic growth. Charles Jencks observed that Gehry "followed a clear development…His extraordinary accomplishment has been to be so creative and interesting for so long."[97] Paolo Favole noted that "In his later buildings, Gehry applied the principles of his first projects on a significantly larger scale," and that the Guggenheim was "the outcome of a process that began with the breakdown of buildings into volumes" at least a decade earlier.[98] Gehry has spoken of his development of an attitude that allowed him to reconcile himself to letting individual projects go, by realizing that his work as a whole is continuous: "at some point I stop, because that's it. I don't come to a conclusion, but I think there's a certain reality of pressures to get the thing done that I accept. It's maturity, or whatever you want to call it, to say, stop, go, finish. I've got other ideas now, and the door is open for the next move, but it's not going to happen on this building, it's going to happen on the next one." [99]

The psychologist Howard Gruber observed that there is widespread scholarly agreement "that Darwin's development was a true epigenesis: a series of structures with each phase growing out of the previous, always in the interaction with new circumstances provided by a changing scientific and social environment."[100] The biologist Michael Ghiselin contended that the nature of Darwin's scholarship has sometimes caused its strengths to be overlooked: "The mind not attuned to technicalities is hardly likely to appreciate Darwin's real merits. His manner of thinking gives rise to no obvious spectacle … Perhaps Darwin will always have most appeal to the connoisseur." He stressed that Darwin's incremental research process does not diminish his achievement: "That

Darwin had to proceed by gradual steps in no way detracts from the fact that he alone made them…Darwin's capacity for developing his ideas, and for thereby generating new ones, was no common talent."[101] The geneticist Steve Jones emphasized the continuity of Darwin's work: "His literary canon makes sense only when considered as a whole. At first sight its subjects seem disconnected – earthworms, inbreeding, barnacles, plant hormones, domestication, insect-eating plants, the expressions of joy or despair in dogs, apes, and men – but in truth all share a theme: the power of small means, given time, to produce gigantic ends."[102]

In some cases, the majesty of the extended effort witnessed in the life cycle of a great experimental artist's creativity has in itself become a source of inspiration to other practitioners. The scholar Ernst van de Wetering observed that Titian, who worked into his 80s, became a legendary figure: "He was the painter who had consorted with princes on an almost equal footing, but what had made him almost as intriguing was that his style changed so radically in the course of his long life. After beginning with a fine technique he later adopted a manner which Vasari called '*pittura di macchia*,' or 'painting with splotches.'" Van de Wetering contended that the great Italian master's late style had a particular importance for Rembrandt:

> One of the most noteworthy statements in Vasari's *Life* of Titian, and possibly the most important one for an understanding of Rembrandt's development is the remark that behind the apparently effortless "*pittura di macchia*" … lay a vast store of knowledge and experience. Vasari accordingly warned young artists not to attempt this technique, stressing…that an artist should begin with a painstaking and fine technique and adopt the rough manner later in life. Surveying Rembrandt's career, it is as if he took this advice very much to heart.

Other distinctively experimental features of Titian's late technique included "the countless modifications to his work" in the process of painting that were "an almost inevitable side-effect of a method" that involved working "with paint alone, without making drawn studies on paper," and his custom of leaving many works "in a state which could only have been regarded as unfinished

by the standards of contemporary painting practice." Vasari's *Life* of Titian was translated into Dutch in 1604, a year after Rembrandt's birth, and his analysis of the Italian master became current in Dutch workshops, so these aspects of Titian's experimental approach would have been known to Rembrandt. Rembrandt did not visit Italy, so he saw only a few of Titian's paintings, but he owned a "very large book with almost all of the works of Titian" – prints of Titian's paintings, the principal means by which innovations circulated among artists at the time. Rembrandt borrowed specific compositions and poses from Titian in several paintings, including a 1640 self-portrait. And van de Wetering has argued that the evolution of Titian's experimental approach may have had a greater impact on Rembrandt, and later experimental painters, than even Titian's art.[103]

Many artists have been inspired by Cézanne's long and dedicated commitment to the development of his art, in recognition that his "whole life went into the art of painting."[104] Georges Braque, whose initial departure into Cubism was based on studying both Cézanne's paintings and his published letters, reflected that Cézanne's revolution was a product of his personal investment: "He melds his life in the work, the work in his life."[105] For the poet Paul Valéry, Cézanne provided "the example of the dedicated life."[106] The poet Seamus Heaney agreed:

> Sitting there *sur le motif*, his grumpy contrary old back turned on us as he faces the humpy countervailing mountain…The first art book I bought myself was about Cézanne…What I love is the doggedness, the courage to face into the job, the generation of what Hopkins would have called "self-yeast"…This may or may not be the Cézanne known to the art critics and historians, but he's the one I've lived with, the one rewarded with those incontrovertible paintings, so steady in themselves they steady you and the world—and you in the world.[107]

The painter Brice Marden admired Cézanne for "this intense, long, slow process of working, looking, assimilating."[108] The painter R.B. Kitaj was inspired by Cézanne's late work: "Cézanne's last three great *Bather* pictures excite me more than any other art except Kafka's three novels.

Both of these trios were left unfinished/finished at the death of their makers. Cézanne's lessons appear endless to me, encyclopedic like, say, Shakespeare or Beethoven."[109] Meyer Schapiro explained that "The greatness of Cézanne does not lie only in the perfection of single masterpieces: it is also in the quality of his whole achievement…His art has a unique quality of ripeness and continuous growth."[110]

William Butler Yeats labored for decades "to make my work convincing with a speech so natural and dramatic that the hearer would feel the presence of a man thinking and feeling," and his mature style became a powerful influence on younger poets.[111] But the process of his development was also an inspiration. T.S. Eliot wrote that "to have accomplished what Yeats did in the middle and later years is a great and permanent example – which poets-to-come should study with reverence – of what I have called Character of the Artist: a kind of moral, as well as intellectual, excellence."[112] Seamus Heaney elaborated on the lessons of Yeats' experimental evolution: "What Yeats offers the practicing writer is an example of labor, perseverance. He is, indeed, the ideal example for a poet approaching middle age. He reminds you that revision and slogwork are what you have to undergo if you seek the satisfactions of finish…He proves that deliberation can be so intensified that it becomes synonymous with inspiration."[113] Heaney held up Yeats—and three other experimental poets—as models of greatness in aging:

> [I]n certain great poets—Yeats, Shakespeare, Stevens, Milosz—you sense an ongoing opening of consciousness as they age, a deepening and clarifying, and even a simplifying of receptivity…It's like those rare summer evenings when the sky clears rather than darkens. No poet can avoid hoping for that kind of old age.[114]

John Berryman was another younger poet who was inspired by Yeats' example. Berryman was an experimental writer, whose art developed late: when he was 50, Robert Lowell wrote in a review of the *Dream Songs* that "His writing has been a long, often back-breaking search for an

inclusive style, a style that could use his erudition and catch the high, even frenetic, intensity of his experiences, disgusts, and enthusiasm."[115] Berryman's recognition of Yeats' career pattern had sustained him. Early in his career, he told his future wife that he did not envy the early fame of his friend and contemporary, the conceptual poet Delmore Schwartz, explaining that "Yeats's way was the ideal way. A long slow development, the work getting better, the character stronger, until the late great poems."[116] The scholar Thomas Travisano contended that this was not mere rhetoric: "Berryman's adoption of Yeats as a model for his own development…meant that he was willing to risk early weakness, even failure, in order to achieve later success."[117]

Piet Mondrian was one of the pioneers of abstract painting, and his gradual experimental development led him to produce his greatest individual painting at the end of his life.[118] The critic David Sylvester wrote that "A Mondrian retrospective is not just a procession of great pictures, but a progression which in itself is an aesthetic experience: the trajectory of the man's art becomes as much a thing of beauty as the art."[119] Mondrian's practice inspired later artists: the Abstract Expressionist Barnett Newman wrote in the 1940s that Mondrian's "example as an artist and man has created respect for the steadfastness to principle" he demonstrated.[120]

Frank Gehry's inspiration from Le Corbusier's chapel at Ronchamp derives not only from the beauty of the building, but also from his respect for the process that produced it. Gehry explained that he still returns to see the chapel every year because "It's so beautiful. It's almost perfect…Even though I'm not religious, it's an uplifting experience, and I know Corbusier's work well enough to know where it came from and the struggle he went through to get it there. For seven years he worked on it, and I studied all the variations he worked on."[121]

Young conceptual innovators are often brilliant and flamboyant, and their bold early achievements explode on their disciplines, creating instant controversy and excitement. In

contrast, great experimental innovators tend to be diffident and cautious, more concerned with making further progress in their research than in attracting attention for what they have achieved. Their discoveries generally emerge piecemeal and unobtrusively, with no single embodiment or announcement. The neglect of their results is often also caused by their own modesty, as many observers take at face value their protestations that their work is inadequate or incomplete, failing to recognize that doubt and uncertainty are inherent in inductive research. Simply put, the gradual and incremental processes followed by even great experimental innovators often causes the importance of their innovations to be overlooked.

In the introduction to his final book, the 72-year old Charles Darwin admonished a Mr. Fish, who had earlier rejected Darwin's "conclusions with respect to the part which worms have played in the formation of vegetable mould, merely on account of their assumed incapacity to do so much work." Darwin scolded Mr. Fish for denying that worms could be of much importance because of their presumed weakness and small size, and concluded that "Here we have an instance of that inability to sum up the effects of a continually recurrent cause, which has often retarded the progress of science, as formerly in the cause of geology, and more recently in that of the principle of evolution."[122] So too perhaps in creativity: extended intellectual evolutions may be no less important than sudden intellectual revolutions, but they are less conspicuous, and their consequent neglect may retard the progress of our knowledge.

Disciplines and Life Cycles

In *Age and Achievement*, the psychologist Harvey Lehman measured the ages at which large numbers of practitioners of dozens of different activities made their greatest contributions. For each of these activities, he placed all of these peak ages in a single statistical distribution, then

identified its central tendency, which he called the period of "maximum average rate of highly superior production." For oil painting, this period was ages 32-36; for lyric poetry, 26-31; and for novels, 40-44. Among his conclusions, he contended that "the golden decade for the writing of secular poetry occurs not later than the twenties," and for novels, that "an author's one best book is most likely to be written in the forties."[123]

The central tendency of a distribution is most informative about the behavior of the individuals included in it when a population is homogeneous with respect to the relevant behavior; it becomes less so as the heterogeneity of the population increases. Lehman's period for all painters to produce their best work, ages 32-36, does not include the single most important year in the career in the career of the greatest painter of the twentieth century – Picasso, age 26 – and it is decades away from the peak year for the greatest painter of the nineteenth century – Cézanne, age 67.[124] Lehman's approach, citing a single period of central tendency for a distribution that includes all painters, obviously cannot shed any light on differences, like this one between Cézanne and Picasso, within a single discipline. Acceptance of Lehman's analysis, with a single distribution for the entire discipline, furthermore tends to encourage the belief that the creative life cycles of painters are homogeneous, and consequently to discourage disaggregated study of the individuals involved. So for example this would conceal the enormous differences in methods and goals that separated the experimental Cézanne from the conceptual Picasso, and would greatly reduce our understanding of the sources and means of creativity. Unfortunately, this is just what has occurred in most of the research by psychologists on creativity that has followed that of Lehman.

Lehman concluded that "Possibly every human behavior has its period of prime."[125] A series of psychologists have followed him in referring to a single prime period for practitioners of

given disciplines. Poetry is an example. Colin Martindale wrote in 1989 that "In general, a person's most creative work is done at a fairly early age, and this age of peak productivity varies from field to field. It is fairly early in lyric poetry…(ages 25-35)…Only a few specialties, such as architecture and novel writing show peak performance at later ages (40-45)."[126] Howard Gardner wrote in 1993 that "lyric poetry is a domain where talent is discovered early, burns brightly, and then peters out at an early age. There are few exceptions to this meteoric pattern."[127] Dean Simonton wrote in 1994 that "In some fields creative productivity comes and goes like a meteor shower; the peak arrives early, and the decline is unkind. In other creative domains the ascent is more gradual, the optimum point is later, and the descent is more leisurely and merciful…In the arts, for example, the curve for writing novels peaks much later than that for poetry writing."[128] Elsewhere, Simonton explained that this difference in life cycles was a result of the difference in the speed at which works in the two genres are produced: "Fast ideation and elaboration are characteristic of lyric poetry, whereas writing novels requires more time both for isolating an original chance configuration and for transforming it into a published communication configuration."[129] Mihaly Csikszentmihalyi observed in 1996 that "the most creative performances in some domains are the work of young people, while in other domains older persons have the edge. The most creative lyric verse is believed to be that written by the young."[130] James Kaufman declared in 2004, "Poets peak young."[131] Keith Sawyer asserted in 2006 that creative life cycles are homogeneous within activities: "Every creative domain has its own characteristic inverted-U shape that tends to apply to all individuals working within that domain. Each domain has a typical peak age of productivity, the age at which the most significant innovation of a career is typically generated; and each domain has a distinctive shape to its 'U' curve, with different slopes to the rise and decline."[132]

It is easy to believe that great poets must be young prodigies, because of the striking list of famous poets who made major contributions in spite of dying young, which includes such familiar names as Robert Burns, Lord Byron, Percy Bysshe Shelley, John Keats, Arthur Rimbaud, Giacomo Leopardi, Rupert Brooke, Wilfred Owen, Hart Crane, Dylan Thomas, and Sylvia Plath. This unfortunate roll has made a powerful contribution to the popular conception that poetry is the domain of youth: in the words of the poet Josephine Jacobsen, "the Shelley-Keats image, the youthful figure of the runner fame never outran, lingers."[133] These poets were all conceptual young geniuses. But they are only part of the discipline, for poetry also has its experimental old masters.

We do not have enough systematic studies of poets' creative life cycles to know with confidence the relative frequency of conceptual and experimental innovators among the art's leaders throughout the ages. But one recent study examined the careers of the 11 American poets, born between 1870 and 1940, whose work appears most frequently in anthologies.[134] Five of these poets were conceptual innovators, and six were experimental. For three – E.E. Cummings, Ezra Pound, and Richard Wilbur, all of whom were conceptual – the single decade from which their poems were most often reprinted was their 20s; for three, the conceptual T.S. Eliot and Sylvia Plath, and the experimental Marianne Moore – the most important decade was their 30s; and for five – Elizabeth Bishop, Robert Frost, Robert Lowell, Wallace Stevens, and William Carlos Williams, all of whom were experimental – the leading decade was their 40s.

There is widespread critical agreement that Frost, Bishop, and Lowell arrived at their greatest achievements gradually, relatively late in their careers. The same is true for Stevens and Williams. When Stevens was 67, the scholar F.O. Matthiessen wrote that "Stevens, who did not publish a poem until he was 35, will increasingly be recognized to belong…with that small body

of American artists who have ripened as they have matured."[135] Seven years later, William Carlos Williams wrote that "It is a mark of genius when an accomplished man can go on continually developing, continually improving his techniques as Stevens shows by his recent work."[136] After Stevens' death, the poet Randall Jarrell reflected that Stevens "wrote some of his best and newest and strangest poems during the last year or two of a very long life."[137] The scholar Hugh Kenner observed that "Williams became Williams only at 40."[138] Josephine Jacobsen judged that Williams and Robert Frost wrote poetry "that reached its highest level when the men who produced it were able to speak from great reserves of experience."[139] Williams' artistic goal was to privilege the real and the particular over the abstract and the general: "No ideas but in things." [140] When Williams published the first book of *Paterson* at the age of 64, Robert Lowell wrote that "for experience and observation, it has, along with a few poems of Frost's, a richness that makes almost all other contemporary poetry look a little secondhand."[141] Wallace Stevens admiringly described Williams' late poems as "rubbings of reality."[142]

Robert Frost published "Stopping by Woods on a Snowy Evening," his most frequently anthologized poem, at the age of 48. Wallace Stevens published "The Snow Man," his most anthologized poem, at 42, and "The Idea of Order at Key West," his second most anthologized, at 55. William Carlos Williams published his most anthologized poem, "The Red Wheelbarrow," at 40, and his second, "The Dance," at 59. Robert Lowell published his two most anthologized poems, "Skunk Hour" and "For the Union Dead," at 41 and 42, respectively. Elizabeth Bishop published "One Art," her second most anthologized poem, at 65.[143] These poems are among the greatest achievements of their respective authors, who are all among the greatest American poets of the twentieth century. They constitute powerful evidence against statements like that quoted above of Lehman, that there is a golden decade for writing poetry in the twenties, or of Gardner,

that there are few exceptions to the pattern of early decline of lyric poets. Nor can the late greatness of Frost, Stevens, Williams, Lowell, and Bishop be dismissed as exceptional. Other modern experimental poets who were great late in their careers include Robert Browning, Thomas Hardy, William Butler Yeats, Marianne Moore, Stanley Kunitz, Robert Penn Warren, W.H. Auden, John Berryman, Philip Larkin, A. R. Ammons, Derek Walcott, Seamus Heaney, Joseph Brodsky, Billy Collins, and Natasha Trethewey. These are not a few exceptional cases, but rather a substantial proportion of the greatest figures in the modern discipline.

Are experimental old masters as common among important poets as conceptual young geniuses? The answer is uncertain; it would likely depend on the particular period and place chosen for study. Yet for understanding the history of modern poetry, or creativity in general, this question seems much less important than the recognition that great poets are heterogeneous in the nature of their creativity, and consequently in their life cycles. Many great modern poets have been conceptual young geniuses, and many have been experimental old masters. Experimental and conceptual poets differ fundamentally in their goals and methods, and because of these differences they make their greatest achievements at very different stages of their careers.

Several of the psychologists quoted above contended that novelists reach their creative peaks later than poets. Many modern novelists have been great late in their lives. Twain published *Huck Finn* at 50, and Woolf *To the Lighthouse* at 45. Other examples of modern novelists who produced major works at older ages include Thomas Hardy, who published *Jude the Obscure* at 55; Henry James, *The Golden Bowl*, at 61, Joseph Conrad, *Nostromo*, at 47; Edith Wharton, *The Age of Innocence*, at 62; Theodore Dreiser, *An American Tragedy*, at 54; Marcel Proust, *Remembrance of Things Past*, at 56; Saul Bellow, *Herzog*, at 59; and J.M. Coetzee, *Disgrace*, at 59. But Melville published *Moby-Dick* at 32, and Hemingway, *A Farewell to Arms*, at 30. And the

list of great modern novelists who produced important works at early ages can readily be expanded to include Stephen Crane, who published *The Red Badge of Courage* at 24; D.H. Lawrence, *Women in Love*, at 35; F. Scott Fitzgerald, *The Great Gatsby*, at 29; Henry Roth, *Call It Sleep*, at 28; Richard Wright, *Native Son*, at 32; Albert Camus, *The Stranger*, at 29; Norman Mailer, *The Naked and the Dead*, at 25; J.D. Salinger, *The Catcher in the Rye*, at 32; Jack Kerouac, *On The Road*, at 35; Günter Grass, *The Tin Drum*, at 32; and Thomas Pynchon, *Gravity's Rainbow*, at 36.

Twain and Woolf were greatest late in their careers because of their experimental techniques and goals, whereas Melville and Hemingway were most innovative early because of their conceptual approaches. This same contrast applies to the additional novelists listed above. Hardy, James, Conrad, Wharton, Dreiser, Proust, Bellow, and Coetzee were all important experimental writers, whereas Crane, Lawrence, Fitzgerald, Roth, Wright, Camus, Mailer, Salinger, Kerouac, Grass, and Pynchon were all major conceptual innovators. Many other important modern novelists of both types could easily be named, but this seems unnecessary. Whether there have been more experimental older masters than conceptual young geniuses among great novelists appears likely to depend on the particular period and place studied. But the relative frequency of the two types in general again seems much less important than the recognition that virtually any consideration of the greatest modern novelists must include both types.

Writers have been aware of the contrasting life cycles within their disciplines. William Faulkner, for example, demonstrated his understanding of the contrasting life cycles of conceptual and experimental novelists in explaining his low opinion of his rival Ernest Hemingway. Faulkner noted that there were sculptors, painters, and musicians, "like Mozart, that knew exactly always what they were doing, that used their music like a mathematician uses his formula."[144] He

believed Hemingway was of this type: "He learned early in life a method by which he could do his work, he has never varied from that method, it suited him, he handled it well."[145] In contrast, Faulkner explained that he and Thomas Wolfe had never settled on a fixed method: "We tried to crowd and cram everything, all experience, into each paragraph…That's why it's clumsy and hard to read."[146] Faulkner contended that he and Wolfe had surpassed Hemingway because they had never stopped attempting "to reach the unattainable dream, to accomplish more than any flesh-and-blood man could accomplish, could touch;" it was for their ambition and effort – "the splendor of our failure" – that Faulkner considered their achievement greater than that of Hemingway, who had not challenged himself, but early in his career "taught himself a pattern, a method which he could use and he stuck to that without splashing around to try to experiment."[147] Hemingway was a conceptual innovator whose novels were tightly organized and plotted. In contrast, both Faulkner and Wolfe were experimental writers, who were never able to plan their novels, but discovered their plots as they wrote, and always found organization a challenge.

The psychologist Mihaly Csikszentmihalyi has argued that differences in creative life cycles across domains are a function of what he calls the *structures* of these domains. In his view, the clarity and strict logic of some domains allow young practitioners to master the rules quickly, and to make novel contributions early, whereas the ambiguity of other domains requires much longer periods of study for practitioners to arrive at mastery, and creativity.[148] But this analysis is based on a false premise. Few if any domains, and certainly none in the arts, have a single, fixed set of rules and practices, that are accepted and followed by all practitioners. Instead, many disciplines simultaneously have several different sets of rules. It is common for experimental and conceptual artists or scholars to follow very different practices within a single discipline.

An example is afforded by modern painting. Important modern paintings – works that are studied by scholars, and hang in major museums – have been made by methods as complex and personal as those of the experimental Abstract Expressionists, or by methods as simple and impersonal as those of the conceptual Pop artists. So for example, Willem de Kooning worked on his most celebrated painting, *Woman I*, over an elapsed period of more than two years, whereas Andy Warhol made each of his most important paintings, often aided by an assistant, in a matter of minutes.[149] De Kooning and Warhol had very different creative life cycles: the former was 48 in 1952, the year from which his work is most illustrated in textbooks, whereas the latter was 34 in 1962, his most illustrated year.[150] The complexity of their art was directly related to the difference in their life cycles. Thus de Kooning spent decades developing his gestural style to achieve aesthetic aims, in the process repeatedly painting over virtually every image: his widow recalled that "on any given canvas, I saw hundreds of images go by. I mean, paintings that were masterpieces." But he never stopped making changes: "He simply was never satisfied."[151] The long gestation period of *Woman I* was not caused by slow and painstaking execution; de Kooning's brushwork was in fact done quickly. The painting's extended creation was instead a product of major changes in the image over time, as de Kooning struggled with the proportions of the figure. And even when he finally abandoned the painting – which today hangs in New York's Museum of Modern Art – de Kooning did not consider it a success: "in the end I failed. But it didn't bother me because I had, in the end, given it up; I felt it was really an accomplishment."[152] In contrast, Warhol made his most frequently illustrated works in the very first year he adopted the mechanical technique of silkscreening. He was not trained in using the method, and routinely made errors that professional industrial printers would not have made. A friend of Warhol's who was a skilled printer recalled that Warhol actually wanted a bad technique: "These smears and

blurs…weren't intentional at all. It just came out like that and he said, 'Oh, isn't that interesting.' He would say things like that. 'Oh, I love it this way. Let's leave it.'"[153] But the flaws in execution were irrelevant, for Warhol's innovations were not aesthetic, but conceptual – the use of the mechanical technique, the serial imagery of the paintings, and the basis of the images in photography.

The simplicity of Warhol's goals and techniques thus allowed him to innovate quickly and early, whereas the complexity of de Kooning's goals and methods led him to innovate gradually and late. But de Kooning and Warhol were not members of different domains or genres, for in the psychologists' categorization they were both oil painters. The fact that both were central figures in advanced art within a short span of time demonstrates the error of the assumption that domains have fixed rules, followed by all practitioners.[154]

Nor is painting unique in this respect. In 1929, in the conclusion of an essay surveying the differing goals of different types of novelists, Virginia Woolf observed that " 'the novel,' as we still call it with such parsimony of language, is clearly splitting apart into books which have nothing in common but this one inadequate title. Already the novelists are so far apart that they scarcely communicate, and to one novelist the work of another is quite genuinely unintelligible or quite genuinely negligible."[155] Woolf's emphasis on the growing diversity of novelists over time calls attention to another basic source of error in psychologists' use of disciplines, or domains, as aggregate categories in their analysis of the life cycles of creativity. For the histories of virtually all intellectual disciplines testify precisely to the creativity of practitioners in violating established disciplinary conventions, and in the process changing the boundaries of disciplines. So for example neither the gestural abstractions of Pollock or de Kooning nor the silkscreened images of Warhol could have been seriously considered as paintings by any significant artist or critic of the

early twentieth century. Yet today both are widely considered to be among the most important contributions to painting of the twentieth century. And even one of the few basic conventions shared by nearly all the paintings of both Pollock and Warhol, the application of paint to a two-dimensional support, was earlier conspicuously violated by Picasso, the greatest painter of the twentieth century, when he invented collage.

Picasso himself explained succinctly why creativity should not be analyzed by reference to the domain. When a publisher instructed the photographer Brassaï not to bother photographing one of Picasso's works for a planned book on Picasso's statues because the publisher didn't consider it a sculpture, Picasso was incensed, asking, "Who does that man think he is, to tell me, Picasso, what is or is not a sculpture! He's got some nerve! I just might know more about it than he does." Picasso understood that the boundaries of disciplines are not defined by outsiders, whether publishers or scholars, but rather by the actions of practitioners, and that as a result these are constantly subject to change. Thus Picasso said to Brassaï, "What is sculpture? What is painting? Everyone's still clinging to outdated ideas, obsolete definitions, as if the artist's role was not precisely to offer new ones."[156] The critic Peter Schjeldahl made precisely the point that innovators change the rules of their domains in reviewing an exhibition of the revolutionary early Cubism of Picasso and Braque: "It's a made-up system that laid down the surefire principles of modern revolution: 1) consider whatever you're doing a game, and 2) change the rules so you win."[157]

Picasso was particularly aware of the malleability of genres and domains, because he played a pivotal role in making the history of modern art the story of how artists have changed the boundaries of their disciplines. His invention of collage triggered an outpouring of innovations by which artists – almost all young and conceptual – created new forms that they or their admirers

named to establish their independence as new genres. From readymades and photomontages in the 1910s, through rayograms and frottages in the ‘20s, mobiles and found objects in the ‘30s, décollages and environments in the ‘40s, assemblages and combines in the ‘50s, and many more, dozens of new genres of visual art arose in the course of the twentieth century.[158] These eventually became so numerous that many young innovators ceased bothering to name their new forms. Dead and often sectioned animals in vitrines, for example, are so closely associated with Damien Hirst that the artist had no need to trademark the practice by naming it. In 1996, Hirst remarked that he had discovered that whatever he did “it’s all art,” explaining that “I wanted to be stopped, and no one has stopped me. I just wanted to find out where the boundaries were. So far, I’ve found out there aren’t any.”[159] Hirst is among the most influential visual artists alive. Psychologists might struggle to classify him – painter, sculptor, collagist, installation artist? – but the effort would be misguided. Hirst is a bold conceptual innovator whose most influential work, done early in his career, deliberately violated the boundaries of existing artistic disciplines.

Means, or any other statistical measures of central tendency, are powerful tools for summarizing the behavior of large, homogeneous populations. But they are less useful for small, heterogeneous populations, and this is the case for innovators. Cézanne and Picasso should not be aggregated within a single distribution, nor should Melville and Twain, Bishop and Plath, Hitchcock and Godard, or Stieglitz and Sherman. Understanding their creativity requires us to understand their very different approaches to their work, and this can only be done by studying them individually.

The scholar Rob Pope recently stressed that genre is never subject to fixed or universal definition:

> *all* genres, in so far as they continue to be alive and vibrant, are as “old” as we find them and as “new” as we (re-)make them. This fact is often obscured by the persistently neo-

> Classical tendency to treat genres as fixed, pure and distinct categories…Such an approach may be initially convenient but is grossly distorting and fundamentally limiting.[160]

Experimental and conceptual innovators can take radically different approaches, and effectively follow very different conventions and rules, within what is generally considered a single genre or discipline. The theory of creativity presented here recognizes that there are both experimental and conceptual innovators in nearly every intellectual activity, and that as a result almost every discipline has its own old masters and young geniuses.

The heterogeneity of practitioners and products in virtually every intellectual discipline makes aggregation by discipline unsatisfactory in analyzing the life cycles of creativity. In general, experimental innovators consider their disciplines more ambiguous and uncertain than their conceptual peers. And this is true in scholarship as well as the arts. Great scholarship can be as nuanced and detailed as the inductive discoveries of Darwin, or as clear and abstract as the deductive discoveries of Einstein. Understanding creativity requires us to recognize the presence, and importance, of both conceptual young geniuses and experimental old masters in virtually every intellectual activity.

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