Section I

BASIC CONCEPTS

CHAPTER 1

Creativity Research

A Historical View

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Creativity Research: A Historical View

The growth of creativity studies continues to accelerate. This makes perfect sense given the applications of creative studies to education, innovation and business, the arts and sciences, and society as a whole (Florida, 2002; Runco, 2007; Simonton, 1997). Ironically, there is much to be learned about creativity, both by moving ahead with new research and theories and by looking back at what has been explored before. An examination of the history of research on creativity suggests that many ideas and issues have been discussed literally for hundreds of years. This chapter presents one history of research on creativity. There are other perspectives on the topic. Some of these focus on one era or compare two periods of time. Bullough, Bullough, and Mauro (1980), for instance, compared eighteenth-century Scotland with fifteenth-century Italy. Kroeber (1944), Lamb and Easton (1984), Martindale (1990), Murphy (1958), and Naroll and colleagues (1971) also compared specific historical eras in terms of various indices of creativity. Many others have inferred something about creativity and history via biography and autobiography (see Gardner, 1993). Our own perspective directed us to the work of eminent individuals (e.g., Francis Bacon, Darwin, Galton, Malthus, Adam Smith) who had a particular impact on the clarification and eventual meeting of the concepts of research and creativity. The present chapter is unique in that instead of focusing on one era or person, it takes a broad view and examines extended historical changes in the concept of creativity.

Our assumption is that history is the medium in which ideas and events build up and arrive, with some significant effects rarely going away. (This is history seen as a slow boil.) In this chapter we take the position that the early conceptualizations of creativity and research were in themselves exceptional creative acts, as was the eventual bridging of these concepts through deliberately applying research methods. These methods were essential not only to the meaning and significance of creativity in human experience, but to how and why historical events were set in

motion. Understanding this should help us appreciate the following three aspects of creativity within history.

The first is that the significance of historical processes lies as much in their timing as in their content. "When" determines "what" will be important. This has been recognized in reports that Rembrandt was not all that well known in his own time, Van Gogh died a pauper, and no one gave much credence to Mendel's theories for 50 years. Yet the impact of "when" applies well beyond the recognition of individual creativity. It applies to the concepts related to creativity and to the methods used to study it. Second, institutions and identifiable groups are critical in selecting and giving coherence to the important strands of possibilities from those already in the work and minds of interested persons. Third, the relevance of ideas becomes apparent only when there is a group of engaged articulate persons deeply concerned with the same question, problem, or set of possibilities. This implies that (a) a critical mass of information and interest must coexist and be in place and (b) significance and meaning not only are abstract but, as William James pointed out, come from consequences, not all of which are predictable. Seen in this light, history is experimental.

Some of the most evident creativity in Western history can therefore be found by tracing evolving concepts of research and creativity through the past 2,000 years, and by examining their eventual linkage in the late nineteenth century after centuries of being apart. The necessary first step in doing research was to have the concept of research in mind, which more or less required the invention of research. The next step was nearly as difficult but no less important. This was to believe that doing research on human nature – rather than merely speculating about it – was as important and as feasible as doing research on physical nature. The history of research on creativity began with the recognition that research constitutes an effective and practical way of learning about and understanding the world around us. Aristotle, Kant, and many other luminaries had much to say about creativity (see Rothenberg & Hausman, 1976), but they often included it in genius and other expressions of exceptionality, and they did not base their ideas about it on rigorous empirical evidence.

The concept of creativity has its own history, taking an intellectual path that was for two centuries independent of the institutionalization and conceptualization of research. At their beginnings and during most of their histories of development, research and creativity were not viewed as related to one another; therefore, if there were to be creativity research, the pairing of creativity and research had to go through several major intellectual transformations, and a deliberate extension in how scientific research was defined and could be applied needed to be undertaken. As it was, it took another 150 years after research was a recognized and widely encouraged institutional undertaking before the concept of creativity was sufficiently sculpted out of the many debates regarding the meaning and eventual separation of such competing ideas as imagination, originality, genius, talent, freedom, and individuality (Engell, 1981; Gruber, 1996; Kaufman, 1926; Martindale, 2007; Runco, 2007, chapter 13; Singer, 1981–1982). As we will show in detail, the invention of research was the outgrowth of long-standing questions about the nature of physical laws and the belief that it was possible for men and women to understand the physical world without divine intervention. The conceptualization of creativity, on the other hand, grew out of discussions and arguments regarding the basic nature of the human being when released from institutional doctrine. Early on, these debates involved only a slight interest in how this could be investigated. The main issue was freedom, a topic taken up later by Barron (1968) and Maslow (1973).

Creativity research is booming. Yet not long ago there were few empirical articles and scholarly books specifically on the subject (Albert, 1969; Feist & Runco, 1993; Guilford, 1950). In the words of Feist and Runco (1993), "One of the most widely cited

statements from Guilford's article is that out of the 121,000 titles listed in *Psychological Abstracts* from the late 1920s to 1950, only 186 dealt with creativity. This is fewer than 2 articles out of 1,000. We recently discovered that the figure for more recent creativity research is roughly five times higher. The percentage of articles dealing with creativity in the *Psychological Abstracts* has grown from .002% in the 1920s to approximately .01% in the 1980s. From the late 1960s until 1991, almost 9,000 creativity references have been added to the literature" (p. 272). Virtually every major twentieth-century psychologist (e.g., Freud, Piaget, Rogers, Skinner) has taken creativity seriously and explored what it means to be creative, and at present the field can be described only as explosive. It has been noted that the maturing of a professional interest can be seen in the growth of its journals. Creativity research now has its own scholarly journals (e.g., *Creativity Research Journal*, and *Psychology of Art, Creativity, and Aesthetics*), and "creativity" is attracting increasing attention in the media and popular press.

Conceptions of Creativity

Pre-Christian Views of Creativity

Long before the Christian view of creativity had begun to emerge, there were efforts to grasp the meaning for humankind of what we now recognize as creativity for humanity. In general, the pre-Christian understanding, a view that has had influence on our thinking throughout the centuries, is the concept of genius that was originally associated with mystical powers of protection and good fortune. It is when the Greeks placed emphasis on an individual's daimon (guardian spirit) that the idea of genius became mundane and was progressively associated with an individual's abilities and appetites, both destructive and constructive. Creativeness took on a social value, and by the time of Aristotle an association with madness and frenzied inspiration arose, a view that reappeared during most of the nineteenth and the first half of the twentieth centuries. The succeeding Roman view of genius had two additional characteristics given to it: It was seen as an illustrious male's creative power, and it could be passed on to his children. At this point creativity was a male capacity. Giving birth was the exception.

The Early Western View of Creativity

The earliest Western conception of creativity was the Biblical story of creation given in *Genesis*, from which followed the idea of the artisan doing God's work on earth (Boorstin, 1992; Nahm 1957). Boorstin described it this way:

> *For man's awareness of his capacity to create, the Covenant was a landmark. It declared that a people become a community through their belief in a Creator and His Creation. They confirmed their creative powers through their kinship, their sharing qualities of God, their intimate and voluntary relationship to a Creator – God. Christianity, [by] turning our eyes to the future, played a leading role in the discovery of our power to create. (1992, pp. 42, 55)*

This belief reflects a significant difference between Western and Eastern thinking about the goal of creativity and the participants' role in the process. For the Hindus (1500–900 BC), Confucius (c. 551–479 BC), and the Taoists and Buddhists, creation was at most a kind of discovery or mimicry. Apparently the early Buddhists emphasized natural cycles, and thus "the idea of the creation of something ex nihilo (from nothing) had no place in a universe of the yin and yang" (Boorstin, 1992, p. 17). Plato felt that nothing new was possible, and art in his time was an effort to match or mimic ideal forms. Originality, which has become the critical contemporary marker of creativity (Runco, 1988), was not an early attribute of creativity (Child, 1972; Dudek, in press; Pratt, 1961). Incidentally, evidence of parallel differences between the East and the West can still be found (Kwang, 2001; Runco, 2001, 2004). More often they are today explained in terms of collectivism and individuality,

but these lead to the same conclusions, with the East tending to relegate creativity and the West giving individuals the option for it.

These assumptions were not seriously challenged for nearly 1,200 years. Then, during the Middle Ages, a new Western perspective arose, with special talent or unusual ability manifested by an individual (almost always a male) viewed as a manifestation of an outside "spirit" for which this individual was a conduit. Early in the Renaissance, a significant change in this view took place. At this historical moment the divine attribute of great artists and artisans was recognized and often emphasized as their own abilities and perspective. This change in perspective was not isolated, but rather part of a broad set of social transformations. Winston-Given (1996) identified the spread of the English language, the growth within the medical and judicial professions, a rise in religious diversity and even nonconformity, and the dramatic reduction of serfdom as the major influences on these transformations.

These changes were quite subtle until the Renaissance was clearly underway (approximately in the fourteenth through seventeenth centuries). Even though Chaucer used the word "create" as early as 1393, the conceptual outline of creativity remained relatively faint and even at times was lost sight of until most of the major philosophers (e.g., Hobbes [1588–1679] and Locke [1632–1704]) of the Enlightenment were able to move beyond a concern with imagination, individual freedom, and society's authority in human affairs.

The Invention of Research

Throughout most of the years and the many philosophical discussions that took place, scientific works were known for their power of discovery and cultural and religious disruption. Three of the Western world's greatest scientists – Copernicus (1473–1543), Galileo (1564–1642), and Newton (1642–1727) – had given proof of this. Yet it took more than their example. It required a widespread change in perceiving the laws of the physical world working in the here and now as well as a recognition of how this lawfulness related to human existence, how science produced knowledge about that relationship, and – just as important – the social purposes scientific knowledge could serve (Shapin, 1996).

In the eighteenth century, two profound intellectual perspectives concerning reason and individualism shaped Western thought: The Enlightenment became an identifiable and coherent intellectual philosophy, the clearest expression of which was the intellectual attacks on what was believed to be unwarranted authority emanating from a variety of (dogmatic) nonscientific sources. While the Enlightenment was reaching its own critical mass, natural science as an institutionalized philosophy and methodology was taking shape (Bronowski & Mazlish, 1960). What made this primarily an English intellectual movement was that although parts of the Enlightenment did occur in continental Europe, they did so primarily among poets and artists. Those scientists who were interested were "speculative." Evidence of this growing interest in science is that the word "research," meaning deliberate scientific inquiry, entered English in 1639, soon after the appearance of the word "researcher" in 1615.

Just how profound these changes were for Western culture can be gauged by the transformed status of the Bible. For hundreds of years it had been a divine source of wisdom and morality, but by the late eighteenth century it had become a secular model of literature. Prickett (1996) put it this way:

> *During the late 18th century the Bible underwent a shift in interpretation so radical as to make it virtually a different book from what it had been 100 years earlier. Even as historical criticism suggested that, far from being divinely inspired or even a rock of certainty in a world of flux, its text was neither stable nor original, the new notion of the Bible as a cultural artifact became a paradigm of all literature. While formal religion declined, the prestige of the Bible as a literary and aesthetic model rose to new heights.* (p. ii)

Knowing the depth, power, and range of the Enlightenment's resistance to divine

authority and religion's "wisdom," we should not be at all surprised that another kind of freedom would become a part of the paradigmatic shift. This was the individual's right to explore his world without institutional permission and divine guidelines or intervention.

Although ideas related to creativity had been relatively unchanged between the years 1500 and 1700, the other changes taking place were exceptionally fertile grounds for the idea of research. It is around this time that "science" and scientific thinking took form as the preeminent instrument of discovery and models for thinking about the physical world. The changes that evolved from this merger of scientific model and technique were so complete that many writers believe this was the beginning of a distinctive, modern Western civilization, "from a world of things ordered according to their ideal nature to a world of events running in a steady mechanism of before and after" (Bronowski, 1951).

Institutional and Philosophical Antecedents to Research on Creativity

At the same time that a more far-reaching intellectual revolution, known as the English Enlightenment, was gathering persuasive force and an increasing coherence of new attitudes and concerns was emerging, Francis Bacon's (1605/1974) *Advancement of Learning* became an accepted argument for the importance of empirical investigation. The Enlightenment's widespread philosophical and social opposition to authority (e.g., religion, monarchies, and political oppression) grew in parallel to science's own opposition to the ideas of these authorities. These arguments included an ever-increasing belief in the necessity of freedom of speech, the press, and the life of the individual. Freedom, so it was argued, was essential because of the individual's basic rationality, which daily – so it seems – was being confirmed by and in science. The conclusion from all this was that people had no need for artificial authority and social restraint.

As these ideas were being openly championed, the institution that was to embody them and drive the argument home through the seventeenth and eighteenth centuries rapidly took shape. Science and scientific research were institutionalized when the Royal Society was chartered by Charles II in 1662, with John Locke (1632–1704) one of its early members. Two similar academies already existed in France and Italy, but these organizations had little influence on their host societies. Such societal influence distinguished the Royal Society and demonstrates how good a fit there was between science and English society.

At this point research had acquired the purpose of discovery. It is not simply that the Royal Society quickly became a meeting place for otherwise scattered (and often rancorous) scientists and mathematicians of historical eminence, but that the Royal Society institutionalized recognition of their work. The Royal Society formally required that each scientist was to present his work to all the other members. Not only were members expected to publish their scientific work, but to do so only in the Society's Philosophical Transactions. Private papers were no longer to be circulated.

Furthermore, if others were to understand and be able to use an individual scientist's work, then other rules would have to be followed. Personal idiosyncratic language was to be avoided, or at least minimized (Bronowski & Mazlish, 1960). The form of presentation, the symbolism, and the system of notation used by a member would have to be made comprehensible to other scientists.

Of all its requirements, probably the most influential was the obligation to publish one's results in the Society's Transactions, which soon gave the Royal Society a great influence over the reputations of the members. Just how important this influence on reputation became was illustrated in the Society's mediation of the prolonged and bitter debate between Robert Hooke and Isaac Newton. The expectation to "publish for merit," although driven primarily by each individual's motivation for recognition,

at least early on, was itself institutionalized by the Society in two ways: by sense of responsibility to science as an institution, and by its emphasis on publication of scientific results. This requirement accompanied a second goal, which was to make evident the power and practicality of science.

There were two notable consequences of these institutional requirements (vestiges of which remain). One was the reduced individuality shown in published papers. While encouraging individual originality and genius, as they were understood at the time, the Royal Society had installed a set of requirements that effectively stripped scientific communication of signs of individuality. (These expectations operate to this day in scientific journals, although in somewhat modified form.) The second consequence was to shift the Society's early concern with individuality – which ironically some seventeenth- and eighteenth-century writers believed was the sine qua non of creativity – to the Royal Society's explicit emphasis on the lawfulness of nature and the discovery of the practical benefits from science. These benefits, so it was thought, underscored the validity of natural laws and the importance of scientific experimentation in the physical world (i.e., nature). Early debates and speculation on the question about where "ideas" for this program came from were soon overshadowed by a growing confidence in the inventive power of empirical methods and natural science's apparent infinite capacity to produce practical benefits. Yet although physical nature was accepted as science's prime source of knowledge, and man was accepted as a part of nature, the scientific investigation of human nature was not seriously considered during the seventeenth and early eighteenth centuries.

The Great and Nearly Endless Debate

Several further intellectual developments took place before a concept of creativity really developed. One was during the last half of the eighteenth century when science's premise of natural law became widely accepted. Everyday justification for an unshakable confidence was seen all around in the practical inventions natural science was credited for putting into the English economy – the spinning machine and the steam engine – inventions that were accelerating the Industrial Revolution and England's own lead in manufacturing and business over foreign competition.

On a somewhat more speculative level, for English and European artists, poets, writers, and philosophers there remained two questions that had been endlessly discussed throughout the eighteenth century: What were the limits to freedom of thought? What was the social and political significance of such freedom? These questions reflected the abiding issues throughout the eighteenth century. As we know now, until they were answered, there could be no clear understanding of what creativity was, much less what it can do.

The most significant distinctions made in the mid-1700s have to be the separations of the idea of "creativity" from "genius," "originality," "talent," and formal education. At the heart of these debates were efforts to clarify the legitimate sphere of individual freedom as distinguished from social and political restraints. Society's laws and the somewhat arbitrary limitations imposed by authority were naturally in opposition against "original" genius and constituted a pernicious barrier to men's freedom and originality (Addison, 1711/1983). But perhaps there was nothing as influential in propelling the history of creativity than the concerted efforts to understand the differences between talent and "original genius." By the end of the eighteenth century it was concluded that although many persons may have talent of one sort or another, and that this talent would be responsive to education, "original genius" was truly exceptional and by definition was to be exempt from the rules, the customs, and the obligations that applied to the talented. This was not an abstract argument. As Kaufman (1926) and Engell (1981) made clear, these prolonged debates regarding the relationships

and differences among "genius," "originality," "exceptionality," "innate ability," and "freedom" eventually came together in the eighteenth century doctrine of individualism (with the American and French Revolutions just around the corner). But still no concept of "creativity" existed at this time.

Hobbes (1588–1679) was the first major figure to recognize how important imagination was in human thought and planning, and how constructive it could be, an idea that reappeared as a starting point of discussions during the Enlightenment (Braun, 1991; Singer, 1981–1982). To appreciate how difficult it was to develop the concept of creativity, remember it had taken several generations of writers, philosophers, and artists to come close to the concept. Their difficulty can be seen in the fact that their discussions of "imagination" led as early as the 1730s to the phrase, "the creative imagination." By the late 1700s, "imagination itself" was accepted as governing artistic creativity (Engell, 1981, pp. VII–VIII).

Tedious and tangential as they were at times, nevertheless the debates through the eighteenth century eventually came to four important acceptable distinctions, which were to become the bedrock of our present-day ideas about creativity: (a) genius was divorced from the supernatural; (b) genius, although exceptional, was a potential in every individual; (c) talent and genius were to be distinguished from one another; and (d) their potential and exercise depend on the political atmosphere at the time. (For the reader who believes these matters are settled, in our own times similar issues of separation and distinctions [i.e., discriminant validity] can be seen in the research on domain specificity [Albert, 1980; Baer, 1995; Bloom, 1985; Gardner, 1994; Runco, 1986]).

By the end of the eighteenth century it was accepted that neither genius nor talent could survive in repressive societies. When freedom did exist, according to Duff, one of the most prolific and convincing eighteenth-century writers on genius and talent (Kaufman, 1926), spontaneity and genius would be "irresistible" because it reflected an innate predisposition and needed no education, a belief soon shared by Rousseau and later Romantics. On a practical level, the arguments over these distinctions were important in helping define the differences between the exceptional and unpredictable force of genius and the less extraordinary, more predictable talent seen everyday. By the end of the century it was concluded that whereas many people had talent that could respond to education, genius was "original." It was manifested in someone or something that seems to come out of nowhere, out of reach or need of education, and immune from the rules and obligations appropriate for talent. (It is interesting and politically significant that Rousseau saw "genius" in every man with the same exemptions.)

The Influence of Unintended and Unanticipated Consequences

There were two models that incorporated many of the important arguments and practical observations related to research and creativity. One of the models – that of rational science – bears on science's power and the practical use of research, which has been pretty much covered. The other model can be called the "ideology of creativity." It had to do with the social significance and potential dangers of originality and individualism in the context of compliance to authority and maintenance of social order.

The rational-science model has always been formal in its arguments and can appear moderately removed from the day-to-day consequences of research. On the other hand, although there have been much older discussions about the religious and secular significance of creativity, creativity acquired an ideology because of its relevance in defining human nature and social-political conditions.

Although natural science and practical inventors such as Arkwright and Watt were busy demonstrating what human reason and English inventiveness could do, it was the ever-increasing power and numerous practical inventions that eventually led to unforeseen and unintended dire consequences. Rapid population shifts of farmers

and laborers out of their farms and villages and into increasingly dirty sprawling cities, out of cottages and into regimented impersonal factories, led to surges in population shifts and growth, which soon alarmed many persons. Interestingly, while science was still busy demonstrating what rational human reason could do, there now was growing a parallel concern regarding the ultimate effect of these results, especially in terms of social and political stability.

It was not long before increasing numbers of people, especially among the upper-middle class and gentry, were having second thoughts about "individualism," its alleged "irresistible" spontaneity, and the unrestricted use of science. What they were witnessing was clearly not the efficient machine-driven society envisioned early in the Industrial Revolution. The rapidity and threat that characterized this change became one of the most important influences in the development of social sciences. The unpredicted widespread dislocations resulting from natural sciences were too obvious to overlook in spite of natural science's century-old belief that physical nature was governed by rational and intelligible laws. More and more threatening, poorly understood "unintended and unanticipated consequences" were entering the social world and with them calls for political movements and social action. The spreading doctrine of individualism, which motivated the unrest, quickly became the accepted explanation for and source of fear over these "unintended and unanticipated" consequences. In order to understand one of these consequences, we need to recognize that such consequences were not new; they had been an intractable concern during most of Adam Smith's lifetime (1723–1790). He knew they often happened (as did his Swiss contemporary, Jean-Jacques Rousseau).

From the mid-1700s there was an almost constant turmoil in England and Europe. The many dislocations from the Industrial Revolution led to two very diverse but equally influential responses. One was Adam Smith's (1723–1790) rational argument, and the other was Jean-Jacques Rousseau's (1712–1778) Romanticism, which, among other social consequences, became the source of an artistic counterthrust to scientific rationalism. This part of Romanticism's response to the Industrialization of Europe was expressed in artists' emphases on inner feelings as natural and therefore democratic sources of wisdom and artistic inspiration. The conflict soon was identified as between science and feeling, which in turn was personified as between the overly rational scientist and the artist as the misunderstood genius. In 100 years this new identity, which marked artists' sense of deviance and their deliberate defiance of middle-class society, would be used by charlatans such as Lombroso as justification to denigrate artists in general and genius and creativity specifically. Although both reactions occurred at the same time, their consequences for research and creativity had different timetables. These were not coordinated until the end of the nineteenth century through the achievements of Galton and Freud.

Romanticism influenced conceptions of creativity in various ways. It may, for instance, support the associations between creativity and psychopathology. Sass (2000) wrote, "whereas romanticism views creative inspiration as a highly emotional, Dionysian, or primitive state, modernism and postmodernism emphasize processes involving hyper-self-consciousness and alienation (hyperreflexivity). Although manic–depressive or cyclothymic tendencies seem especially suited to creativity of the romantic sort, schizoid, schizotypal, schizophreniform, and schizophrenic tendencies have more in common with the (in many respects, antiromantic) sensibilities of modernism and postmodernism" (p. 55). He defined modernism as "the formally innovative, often avant-gardist, art and literature of approximately the first half of the 20th century" and postmodernism as the "cultural and artistic developments largely occurring after World War II" (p. 56).

More concretely, Romanticism may have direct impact on the stereotypes held by artists, other creators, and audiences. Becker (1995, p. 224) described how, in an effort

to differentiate themselves from those less gifted and their artistic predecessors, intellectuals and artists during the Romantic period adopted idiosyncratic behaviors. These behaviors supported the stereotypical labels of those who wanted to see pathology in genius – those who were defending the cultural or societal status quo. She quoted Coser on this point: "Many a Romantic genius may have assisted in a labeling process "in which others took him more seriously than he perhaps wished, and assigned him to the status of a madman" (from Becker, 1995, p. 224). The significance of such thinking, and of stereotypes about creative persons, are not just theoretical. The short life expectancy of writers (Kaun, 1991) might, for example, be explained in part by the tendency of writers to conform to the eccentric and unhealthful lifestyle that is a part of a stereotype (think of the personality and life of an F. Scott Fitzgerald).

Adam Smith was one of the first to recognize the need for a science of human behavior. His *The Wealth of Nations* (1776) was a deliberate effort to bring together the many reasons for a social science; it is "almost an encyclopedia of the effects of unintended consequences in human affairs . . . the consequences of action are often different from the intentions which motivate the actors" (from Muller, 1995, p. 85). His argument was free of blame and pontifications. His point was that not all consequences were either good or bad, but they were often "unintended" and "unanticipated." One undeniable unanticipated consequence he pointed to was the dramatic and frightening population and industrial upheaval, and one of its consequences he believed was the American Revolution, to which Smith devoted extensive attention. Because of such consequences Smith and others argued that it was imperative to develop a science based on systematic, political, and social knowledge. It was thought such a social science would help anticipate social change before it got out of hand.

Eight years after Smith's death there occurred a major intellectual and empirical development that contributed to the establishment of a social science – the publication of Malthus's *Essay on Population* (1798). It was not simply an argument (there were enough of them) but documentation with exhaustive empirical evidence (rudimentary statistics) detailing the apparent uncontrollable growth and social disorganization in the English population, predicting unanticipated consequences if social and political action were not taken.

The importance of Malthus's work is twofold. His research was as empirical as nonphysical science research would be until Galton. And 40 years later a phrase he had used to explain the social disruptions he described in his *Essay on Population*, "the struggle for existence," provided Darwin (1859) with the explanation for natural selection he was trying to articulate. This particular idea helped organize Darwin's efforts, and the *Origin of Species* added new evidence that human existence was indeed precarious, subject to unintended and unanticipated shifts and demands of natural selection. It did not move according to any individual's wishes or plans, nor embody any morality or purpose. Natural selection was blind.

The intellectual breakthrough for understanding of creativity in the late nineteenth and early twentieth centuries was implied in the role Darwin gave to adaptation in survival. (Freud, who read Darwin and met Galton, was later to incorporate this idea in his psychodynamic theory of defenses and creativity; Albert, 1996; Ellenberger, 1970; Freud, 1900/1953, 1908/1958.)

Adaptation, Diversity, and Natural Selection: Darwin's Empirical Formula for Creativity

From the time it was first discussed, creativity has been enclosed in abstract questions and connected to issues larger than itself (e.g., what is individualism and why do we need individual freedom?). It is only after Darwin worked out the processes underlying natural selection that several basic characteristics of creativity were brought into sharp focus, especially its value in