The Thinker's Guide to

The Nature and Functions of

Critical & Creative Thinking

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Letter to the Reader

To the untutored, creative and critical thinking often seem to be opposite forms of thought — the first based on irrational or unconscious forces, the second on rational and conscious processes; the first undirectable and unteachable, the second directable and teachable. There is some, but very little, truth in this view. The truth in it is that there is no known way to generate creative geniuses, or to get students to produce novel, ground-breaking ideas. There are manifestations of creativity that we do not fully understand. The same is true of forms of criticality. Yet there are ways to teach simultaneously for both creative and critical thinking. To do so requires that we focus on these terms in practical, everyday contexts, that we keep their central meanings in mind, that we seek insight into how they overlap and interact with one another. When we understand critical and creative thought truly and deeply, we recognize them as inseparable, integrated, and unitary.

We believe that creative thinking, especially, must be demystified and brought down to earth. For this reason, we deal with it in this guide not only in terms of its highest manifestation (in the work of geniuses), but also in its most humble manifestations (in everyday perception and thought).

In learning new concepts, in making sense of our experience, in apprehending a new subject field or language, in reading, writing, speaking, and listening, our minds engage in full-fledged (though commonplace) creative acts. To understand how and why this is so, we need not appeal to the esoteric, the recondite, or the arcane.

To live productively, we need to internalize and use intellectual standards to assess our thinking (criticality). We also need to generate — through creative acts of the mind — the products to be assessed. That minds create meanings is not in doubt; whether they create meanings that are useful, insightful, or profound is. Imagination and reason are an inseparable team. They function best in tandem, like the right and left legs in walking or running. Studying either one separately only ensures that both remain mysterious and puzzling, or, just as unfortunate, are reduced to stereotype and caricature.

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PART I
The Inseparability of Critical and Creative Thought

The critical and creative functions of the mind are so interwoven that neither can be separated from the other without an essential loss to both.
— Anonymous

For several reasons the relationship between criticality and creativity is commonly misunderstood. One reason is cultural, resulting largely from the mass media's portrayal of creative and critical persons. The media frequently represent the creative person as a cousin to the nutty professor, highly imaginative, spontaneous, emotional, a source of off-beat ideas, but often out of touch with everyday reality. The critical person, in turn, is wrongly represented as given to fault-finding, as skeptical, negative, captious, severe, and hypercritical; as focused on trivial faults, either unduly exacting or perversely hard to please; lacking in spontaneity, imagination, and emotion.

Criticality assesses; creativity originates.

These cultural stereotypes are not validated by precise use of the words *critical* and *creative*. For example, in *Webster's Dictionary of Synonyms*, the word "critical,"

> when applied to persons who judge and to their judgments, not only may, but in very precise use does, imply an effort to see a thing clearly and truly so that not only the good in it may be distinguished from the bad and the perfect from the imperfect, but also that it as a whole may be fairly judged and valued.

In *Webster's New World Dictionary*, the word "creative" has three interrelated meanings:

> 1) creating or able to create, 2) having or showing imagination and artistic or intellectual inventiveness (creative writing), and 3) stimulating the imagination and inventive powers.

Accordingly, *critical* and *creative* thought are both achievements of thought. *Creativity* masters a process of making or producing, *criticality* a process of assessing or judging. The very definition of the word "creative" implies a critical component (e.g., "having or showing imagination and artistic or intellectual inventiveness"). When engaged in high-quality thought, the mind must simultaneously produce and assess, both generate and judge the products it fabricates. In short, sound thinking requires both imagination and intellectual standards.

Throughout this guide we elaborate on the essential idea that intellectual discipline and rigor are at home with originality and productivity, and also that these supposed poles of thinking (critical and creative thought) are inseparable aspects of excellence of thought. Whether we are dealing with the most mundane intellectual acts of the mind or those of the most imaginative artist or thinker, the creative and the critical are interwoven. It is the nature of the mind to create thoughts, though the quality of that creation varies enormously from person to person, as well as from thought to thought. Achieving quality requires standards of quality — and hence, criticality.

In this guide, then, we explore the interdependence of criticality and creativity, exemplifying this interdependence at the most complex level of thought (that of genius) as well as the simplest level of thought (that of making sense of ordinary objects in everyday experience).

We also explore a corollary theme: that all creation of meaning tends toward systems of meanings rather than existing in the mind as unconnected atomic particles. This is integral to the nature of thought itself. The construction of any meaning assumes other meanings and implies yet further meanings (which in turn imply still further meanings). When attempting to understand any meaning, humans naturally seek to place it in a cluster of meanings, however partial their understanding might be. When they attempt to understand an idea as a thing unto itself, it doesn't take root in the mind. It doesn't connect to the systems of meanings within the mind. In short, for humans to think well, we must think within systems. We must create systems of meaning and assess our creations for accuracy, relevance, and adequacy. More on this point later.

Let's begin with some fundamentals. First, *all thinking is not of the same quality*. High-quality thinking is thinking that does the job set

for it. It is thinking that accomplishes the purposes of thinking. If thinking lacks a purpose — if it is aimless — it may chance upon something of value to the thinker. But more often it will simply wander into an endless stream of unanalyzed associations from one's unanalyzed past: "Hotdogs remind me of ballgames, ballgames remind me of Chicago, Chicago of my old neighborhood, my old neighborhood of my grandmother, of her pies, of having to eat what I didn't like, which reminds me...which reminds me...which reminds me..." Few people need training in aimless thinking such as this, or in daydreaming or fantasizing. For the most part, we are naturals at aimless thinking. We are inherently proficient at daydreaming and fantasizing.

However, we often have trouble in purposeful thinking, especially purposeful thinking that requires posing problems and reasoning through intricacies. Purposeful thinking requires both critical and creative thinking. Both are intimately connected to figuring things out. There is a natural marriage between them. Indeed, all truly excellent thinking combines these two dimensions. Whenever our thinking excels, it excels because we succeed in designing or engendering, fashioning or originating, creating or producing results and outcomes appropriate to our ends in thinking. It has, in a word, a *creative* dimension.

To achieve any challenging end, though, we also must have *criteria*: gauges, measures, models, principles, standards, or tests to use in judging whether we are approaching that end. What's more, we must apply our criteria in a way that is discerning, discriminating, exacting, and judicious. We must continually monitor and assess how our thinking is going, whether it is on the right track, whether it is sufficiently clear, accurate, precise, consistent, relevant, deep, or broad for our purposes.

We don't achieve excellence in thinking with no end in view. We design for a reason. We fashion and create knowing what we are trying to fashion and create. We originate and produce with a sense of why we are doing so. Thinking that is random, that roams aimlessly through half-formed images, that meanders without an organizing goal, is neither creative nor critical.

This is true because when the mind thinks aimlessly, its energy and drive are typically low, its tendency is generally inert, its results usually barren. What is aimless is also normally pointless and moves in familiar alliance with indolence and dormancy. But when

3. The logic that results, in the end, from our reasoning — and that has to be assessed for its fit, for the extent to which it has captured the system (1) to be figured out.

One may use, for example, one's understanding of the major themes in a D.H. Lawrence novel (say, *Sons and Lovers*) as an initial framework for understanding the themes of another (say, *Lady Chatterley's Lover*). The resulting understanding may or may not make sense of the actual story. The logic one forges may be inadequate. Or, again, in studying history, one may use one's understanding of the logic behind an economic crisis (say, that of the 1930s in the USA) to understand the logic behind another economic crisis (say, that of the 1990s in the USA). The mental reconstruction one creates may or may not make sense of the logic of what was actually going on economically in the 1990s. In all our learning, we mentally create provisional models (small-scale logical systems) for figuring out what we are trying to learn (the system we are trying to grasp). We then end up with a product of thought, a system we have created. That system may or may not match reality.

Creative Genius — An Exception?

Some might object to the line of reasoning we have laid out thus far. They might say that the intimate interconnection of critical thinking and creative thinking does not hold for truly creative geniuses. They might argue that creative genius emerges spontaneously and mysteriously, that it is linked to unconscious processes that defy rational explanation, processes that go beyond critical thinking and rational thought. As cases in point, they might cite the work of great artists, inventors, and thinkers such as Leonardo Da Vinci, Rembrandt, Michelangelo, Mozart, Beethoven, Wagner, Edison, Shakespeare, Einstein, Newton, and Darwin.

History teaches us that great minds require cultivation and committed intellectual work.

To think-through the relationship between creative genius and critical thought and respond to these objections, let us consider the following questions:

- To what extent is the capacity for creative genius realized in a purely untutored state?

- To what extent must genius be cultivated through the development of critical thought?

We will briefly approach these questions first conceptually, and then historically.

Language as a Guide

Let us look, first at how language sheds light on genius and related concepts.

The *Oxford English Dictionary* defines *genius* in two ways:

1. As having "natural aptitude, ability or capacity; quality of mind; the special endowments which fit a man for his peculiar work."

2. As "native intellectual power of an exalted type, such as is attributed to those who are esteemed greatest in any department of art, speculation, or practice; instinctive creation, original thought, invention or discovery."

The first definition comes close to what is typically meant by the term gifted, and it implies that the gift predisposes one to high-quality thought within a specialty. The second sense focuses on the successful use of intellectual processes, and primarily on creative production, which need not imply inborn talent.

Genius is better understood in relation to talent, giftedness, aptitude, capacity, ability, and intelligence.

To better understand the concept of *genius*, let us remind ourselves of its most basic meaning, as well as the meanings of some related concepts: talent, giftedness, aptitude, intelligence, brilliance, accomplishment, proficiency, and virtuosity. Consider the following definitions (and distinctions) found in *Webster's New World Dictionary*:

- *Talent*: implies an apparently native ability for a specific pursuit and connotes either that it is or can be cultivated (or left largely undeveloped) by the one possessing it.

- *Gifted*: suggests that a special ability is bestowed upon one, as by nature, and not acquired through effort.
- *Aptitude*: implies a natural inclination for a particular work, specifically as pointing to a special fitness for or probable success in it.
- *Genius*: implies an inborn mental endowment, specifically of a creative or inventive kind in the arts or sciences, or that is exceptional or phenomenal.
- *Intelligent*: implies the ability to learn or understand from experience or to respond successfully to a new experience.
- *Brilliant*: implies an unusually high degree of intelligence.
- *Accomplished*: skilled, proficient.
- *Proficient*: highly competent, skilled, adept.
- *Virtuoso*: a person displaying great technical skill in some fine art, especially in the performance of music.

Notice that talent, gift, genius, and aptitude all imply an inborn disposition to excel within some domain of thought. But intelligence, brilliance, accomplishment, proficiency, and virtuosity need not presuppose innate tendencies. Assuming that these distinctions mirror important qualities in human development, a real possibility is suggested: A person may be highly creative, even brilliant, without having a high degree of innate talent. This possibility is borne out by empirical fact. Many highly accomplished thinkers, rightly considered geniuses, have displayed that brilliance only after investing years in perfecting potential not extraordinary to begin with.

The Narrow-Minded Genius

Before we elaborate this point, let us come to terms with the fact that genius can exist in a highly circumscribed form. At one and the same time, a person can combine "genius" (in one domain of life) with narrowness and parochialism (in all of the others). For example, many brilliant thinkers enthusiastically served in the Nazi regime. The brilliant rocket scientist Werner Von Braun was one such person. The German generals Rommel and Guderian were two others. Within their specialties they functioned at the very highest levels, yet their ethical reasoning abilities and world perspective

