Intuition: A Look Beyond the Surface of Ourselves

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by

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Chapter 1  Intuition: Outdated?

We live in a scientific age: an age of statistical significance, multivariate analysis of variance, linear correlation coefficients, and multitrait-multimethod matrices. Our age wants hard facts and scientific proof rather than feelings and beliefs: we want to know what it is and how it works rather than what it means and why it should work. Thus, it seems that a concept such as intuition would be rather outdated.

Intuition, as a form of thought, does not fair well today. Many people are quite skeptical of such an ambiguous term and, no doubt, many believe it to be completely unreliable, if they believe in it at all. But then, with all the negative connotations associated with the term, it could hardly be otherwise.

Often times, when people think of intuition they think of telepathy or some psychic ability which a "gifted" individual might use to solve a mysterious crime or find missing keys. Or they may think of what logical minds might sarcastically call "women's intuition." However, Bastick says of women's intuition that it "can judge a situation in which the evidence is insufficient or too complicated for a man to reason" (3). And Neisser claims that "mental processes of
this kind [intuitive] seem to be common wherever there are situations too complex for ready logical analysis" (308).

Some common beliefs about intuition are that it is irrational, illogical, unreliable, and ambiguous. And, if these adjectives are meant in a scientific manner and empirical evidence is required for validation, they are absolutely correct. Intuition does not conform to the dichotomy of pure logic, a fact which causes intuition to be frustrating to most people and rejected by many. Intuition does, however, as I will argue, have a rationality, logic, and reliability of its own, and the fact that it is different from scientific thought is what undoubtedly causes it to seem ambiguous. It is unfortunate that many individuals limit their opinion of intuition by placing it under scientific laws. Intuition has much to offer to science and, indeed, to every aspect of life. There was a time when people believed strongly in intuition, and though the times have certainly changed, maybe they haven’t changed as much as the empiricists among us would like to believe.

Men have theorized, and history has shown, a general movement from theological, mystical, and intuitive thought to scientific thought in Western Culture (i.e., Comte’s "three-stages" theory, and Condorcet’s "Progress of the Human Mind") as well as in the microcosm of Greek culture (i.e., Finley’s Four Stages of Greek Thought, and Snell’s Discovery of the Mind). Each of these theories traces the history of thought and follows it to its inevitable conclusion in scientific thought. As Condorcet claims "this pro-
gress [toward the perfection of human faculties via science] will doubtless vary in speed, but it will never be reversed as long as the earth occupies its present place in the system of the universe, and as long as the general laws of this system produce neither a general cataclysm nor such changes as will deprive the human race of its present faculties and its present resources" (229-30). A more complete discussion of one of these four theories will help to illustrate the progression of thought toward empiricism.

As August Comte posits in his famous "three-stages" theory of human intellectual development, the first explanations of why things happen in the world were theological (the theological stage). "The course of nature appeared as a series of miracles deliberately performed by higher powers governing the visible world" (Kolakowski 52). Then in the 6th Century B.C. "the rational spirit characteristic of Greek geometric pottery and even many Greek myths blossomed... into the intellectual examination of the physical world and man's place in it that we call philosophy" (Kagan et al 61). This ushered in the second stage of Comte's theory which he called the metaphysical stage. (Although Comte's theory does not place the beginning of the metaphysical stage until the late Middle Ages, it also holds that the later stages are evident in earlier times. The 6th century B.C. seems to be the real beginning of the second stage because the early philosophers had begun to reject the theological explanations that had been widely accepted and were searching for other explanations. This idea would
likely be supported by Finley whose four stages within Greek thought consist of 1.) the Heroic Mind, 2.) the Visionary Mind, 3.) the Theoretical Mind, and 4.) the Rational Mind.) Finally, during the Enlightenment, Comte believes that the final, positive stage of development began. The positive stage of intellectual development is not concerned with the *whys* of nature, but with the *hows*, and "it does not employ terms that have no counterpart in reality" (Kolakowski 54).

In this stage, ideas of God, love, beauty, the soul and spirit, as well as intuition are fed to the trash compactor and tossed out the back door along with yesterday's garbage.

The reason for starting at this point is that humanity appears to have, in a general sense, followed Comte's theory. In works such as Homer's *The Iliad* and *The Odyssey* we find the first stage exemplified. All phenomena are explained in terms of the gods. And while man has a free will, the consequences of his actions are determined by whether or not he has pleased the gods. Man in this stage does not ask *why* or *how* because he assumes that the gods are in control of the universe; the gods are the *why* and the *how* of nature.

The second stage comes to light as philosophers begin to search for fundamental rational explanations of phenomena. These men were no longer satisfied with the explanations, or rather the lack of explanations about the universe that had previously been accepted by society. Most of the early Greek philosophers believed the world to be knowable, rational, and simple, yet at the same time the basic premises to be unknowable and therefore to be grasped by a non-
rational form of understanding such as intuition: Anaximander and "The Unlimited," Heraclitus and "The Wise," Plato and "The Universals." Heraclitus is the first to suggest that there is a natural order separate from nature and that the order is governed by Logos, "The Wise." Nature changes, but Logos remains the same (Kagan et al 61-62). This poses a new problem.

Once we separate natural order from nature, we find that we have eliminated the possibility of understanding and explaining existence in terms of physical, scientific properties. By studying nature we can learn how it does work, but not why it should work. Regrettably now, the focus has turned totally toward empiricism and we have lost all that metaphysics and philosophy have to offer to the understanding of nature. For those interested in the whys, their questions cannot be proven by science but must be understood by another means. Many of the philosophers discussed in this stage believed this other means of attaining knowledge to be rational, though intuitively not empirically based. Of course, the other side of the coin is that they dealt with things that they could experience through their senses and prove with logic; they began to separate the natural order from nature, and changed the question from why to how. This is the premise of the third stage.

The third stage, the positive stage, ceases to speculate on the hidden meaning of things and focuses on empirical evidence in an attempt to find absolute universal laws which govern phenomena. The Positivists strive to eliminate the
unknown and ignore the unknowable. However, in doing so, they strip from humanity the essence of life. All that remains is the intellect, and all that can be produced is scientific knowledge. Man can no longer find wisdom, but must be satisfied with knowledge; the philosopher, the true philosopher, searches for wisdom (Aristotle defines wisdom as "a union of intuitive reason and scientific knowledge" ["Ethics" 174]), while the scientist seeks only knowledge. In the end, man will know how everything does work, but he will not have even the vaguest notion of why anything should work. Eventually, as history shows, this third stage leads to Logical Positivism, Pragmatism, and Existentialism.

As Chapter 2 shows, logic, reason, and scientific knowledge need not be reduced to this simple progression of development. Logic, reason, and scientific knowledge are useful tools, but they must be used in conjunction with other tools which we possess in order to produce effective results. As the famous mathematician Henri Poincare stated, "...it is by logic that we prove," however, "it is by intuition that we discover" (Arnheim 274). Bastic says that "Some might say that it is our reason that has brought civilization this far, but reason is only the servant of our intuition" (2). Poincare continues, "we believe that in our reasonings we no longer appeal to intuition; the philosophers will tell us this is an illusion. Pure logic could never lead us to anything but tautologies; it could create nothing new; not from it alone can any science issue" (208). Finally, as Bastick relays, "Godel has shown that a consistent system of
reasoning cannot be sufficient to reason about reason. Intuition is needed to guide the blind steps of logic and give purpose to this direction" (3).

Friedrich Nietzsche, the anticipator of Freud and Jung, described the submerged, unconscious, "Dionysian" elements in human nature (intuition) which lead to creativity. Civilization, reason, and the intellect smother life and destroy that which is essential to humanity and culture. "The highest culture requires something of the intellectual element but too much of it means decadence" (Stromberg 178), an idea which becomes increasingly clear as Positivist thought develops. And "Edmund Burke speaks of reason being 'but a part, and by no means the greatest part,' of human nature, while Coleridge claims that the 'calculating faculty' is inferior to the 'creative faculty'" (Stromberg 37).

Thus, it seems clear that intuition is far from an outdated concept and that it still pervades all of our thoughts and actions. Nevertheless, one might justifiably ask just where does an ambiguous idea like intuition fit into this modern, high tech, scientific age? To answer a question with a question, where does it not fit? From Aristotle's nous to contemporary novelist Tom Robbins' "moon wisdom," intuition has been an integral part of human progress; many of the greatest thinkers throughout history have recognized the need for intuitive inspiration as well as logical thought. A short review illustrates this point.
Chapter 2  An Historical Review of Intuitive Thought

From the ideas of the earliest philosophers characteristics of intuition became evident. These men took a major step toward modern thought when they rejected the theological explanations that had previously been accepted by society and looked for rational explanations of phenomena.

Still, though the Greeks are known for their highly rational thought, they were a very spiritual people who believed strongly in non-rational aspects of life. As Moses Hadas states in *The Greek Ideal and Its Survival*, "Despite all that has been said in praise of their rationalism the Greeks were as intensely and continuously concerned with proper attitudes to the supernatural as any people we know" (34). This may be a result of having just come from the theological stage of thought where the spiritual and the supernatural were the ultimate ends and means of life. Even though the early philosophers ventured into a new realm of thought, they were not prepared to completely abandon the earlier ideas which were still quite strong throughout the culture.

Pythagoras exemplifies the idea of the Greek rational and spiritual man. "We have in Pythagoras a ... combination of high intellectual power and profound spiritual insight" (Radhakrishnan 142). Pythagoras, who is well known today for the mathematical theorem which bears his name, "was led by his experiments in music to the understanding of numerical ratios and hence to the foundation of mathematical
Yet, for Pythagoras the universe has order and a harmony which the human soul should strive to imitate and which can only be imitated by purifying the soul, a purification which can only be obtained by silent meditation of the divine reality.

The pre-Socratic philosophers were mostly concerned with the natural world, but in the latter part of the fifth century B.C. thought moved decisively away from the natural world to human beings. Socrates and his followers believed "the proper study of man is man." They believed this to be true both for man as an individual and as a member of society. Aristotle, however, arrived at a more balanced philosophy concerning nature and man.

Aristotle, who has been called the father of modern science, placed more of a decided emphasis on empirical evidence than his predecessors, and yet he too strongly believed in intuition. While this may appear to be a major flaw or inconsistency in his philosophy, a closer look will reveal the unique coherence of his position. Aristotle believed that the soul arrives at truth by five means: art, science, prudence, wisdom, and intuitive reason. We will look at three: science, wisdom, and intuitive reason.

In *Nicomachean Ethics* Aristotle defines scientific knowledge as "a state in which the mind exercises its faculty of demonstration" (171). However, scientific knowledge is based on first principles which cannot be demonstrated, thus scientific knowledge is not a means of apprehending first principles: "The first principles on which scientific
knowledge is based, cannot themselves be the objects of science" (173). Nor are art, prudence, and wisdom means of apprehending first principles (cf. "Ethics," bk 6). Thus, "our only possible conclusion is that they are apprehended by intuitive reason" (174). As Aristotle claims, "intuitive reason deals with ultimates at both ends of the mental process; for both the first and the last terms, that is, both first principles and particular facts, are intuitively and not logically perceived" ("Ethics" 176). For Aristotle, "no other kind of knowledge except intuition is more accurate than scientific knowledge" ("Posterior Analytics" 100b).

Nevertheless, for Aristotle, it is not enough to simply have knowledge, we must act on our knowledge and put it to practical use in daily life: "He who is thoroughly wise in deliberation is he who aims by a reasonable process at what is best for a man in practical life" ("Ethics" 175). Aristotle claims that "the wise man ought to know not only what follows from his first principles; he should know also the truth about these principles. Wisdom therefore will be a union of intuitive reason and scientific knowledge; it may be defined as the complete science of the loftiest matters" ("Ethics" 174). With this concept of wisdom Aristotle unites two apparent opposites--science and intuitive reason: a union that logic alone would not allow. Furthermore, he has brought the ambiguous idea of intuition down to earth and put it to practical use. For Aristotle, intuitive vision within wisdom is the beginning and the end: ". . . from the truths perceived by intuitive reason demonstration starts. . . . We
should therefore pay no less attention to the undemonstrated assertions and opinions of old and experienced or prudent persons than to demonstrations; for their experience gives their eyes the power of correct vision" ("Ethics" 176), a vision born of both scientific knowledge and intuitive reason. Of all the philosophers of Comte's second stage, Aristotle is by far the most scientific, and yet we can hardly deny the strength of intuition in his philosophy.

Plotinus, who lived in the third century A.D., was heavily influenced by Eastern philosophy and, as a result, he returns to some of the mysticism characteristic of earlier philosophers like Heraclitus and Anaxagoras. His concept of the One and the Mind's attempt to reach the One is based on an intuitive form of knowledge which he calls the Intellect. He distinguishes between the "lower soul" which aims toward temporal needs and desires and is governed by the body, and the "higher soul" which aims toward God, the Good, the One, and is governed by the Intellect. He also believes that everyone possesses the Intellect, but not everyone is in touch with the intelligible in the intellect; "for one can have it and not have it available" (Plotinus I.1).

For Plotinus, the One is the supreme principle which unifies all, but "the mind grasps the supreme principle in multiplicity because it is incapable of apprehending its absolute unity" (Armstrong 71). Armstrong also conveys that "for Plotinus the entrance of the One into the soul is an incommunicable and isolated experience" (71), and that "the soul waits, conscious that all effort of its own is useless,
for the sudden Presence, the entrance of the One which fills and illuminates the soul." In other words, logic and reason cannot bring the One into the soul; it is a mystical union which must be intuitively accepted since it cannot be gained or understood by logical means. However, this does not mean that the union will take place without preparation: the soul must prepare for the union by purification, although even complete purification of the soul is no guarantee that the union will take place (Plotinus I.2). Very few approaches to intuition, if any, are as mystical as Plotinus'. For those who believe in mysticism his philosophy is as credible as any, but for those who do not, more scientific approaches are available, as will be seen below.

In the eighteenth century Immanuel Kant led a revolution in philosophy. In an attempt to rescue the realm of value from the scientists, Kant set up two sharply different categories: the realm of science, and the realm of value. The former, which is practical knowledge, deals with the phenomenal world, the world of appearance. The latter, which contains religion, is intuitive and deals with the noumenal world, the world of substantive reality. The two realms should not be confused; the proofs appropriate to science have nothing to do with God since they can never give us values (Kagan et al 639). It is interesting to note that Kant's rescue attempt sets up a dichotomy between science and intuition whereas Aristotle's philosophy unifies the two. However, we should remember that Kant is reacting against the growing emphasis on empiricism.
By the turn of the century, the Romantics would reject "analytical reason in favor of an intuitive 'eliciting of truth at a flash'" (Stromberg 37). Romanticism was, in part, a reaction against the dominant themes of reason, rationalism, mechanistic materialism, and Comte's logical positivism, all of which were elements of the eighteenth century Enlightenment. The Romantics viewed intuition as a source of truth; the artist, when he is creating, as the seer of that truth, a truth deeper than the experimental or analytical. Cole-ridge captured the Romantic ideal of poet as seer when he wrote in "Kubla Khan":

> Weave a circle round him thrice  
> And close your eyes with holy dread  
> For he on honey-dew hath fed  
> And drunk the milk of paradise.

In the mid-nineteenth century the philosopher Schlegel suggested that the truest thought is not rational-conceptual but intuitive-mythic, a concept similar to some Romantic strains (Stromberg 174).

Henri Bergson, a French philosopher in the early twentieth century, became frustrated with the scientific attempts to explain every aspect of life, and although he was not anti-science, he did desire to show that science cannot provide complete knowledge. Thus, he distinguished between the rational, conceptualizing intellect and the intuitive understanding. For Bergson, the scientific analyzing function is a practical tool which deals with useful knowledge; hence, it is not truth-giving because reality cannot be so divided and conceptualized. For Bergson, reality is a con-
tinuum that contains the "life-force" which flows through all things and must be grasped by intuition; this force can scarcely be described save in poetic imagery (Bergson 126-152). Science, however, in an attempt to understand the "life-force," removes the life from what it studies by fragmenting the continuum. Science tells us that the sound of a bell is a series of vibrations, but we experience it as a whole. Likewise, science might describe a novel as a series of words which can be further broken down into a series of various letters, or images, symbols, and allusions, but if we attempt to understand a novel in this way we lose the meaning, and in fact, if we dissect a novel scientifically its meaning is severely damaged if not lost. As Emerson claims in "Nature," "every scripture is to be interpreted by the same [unified] spirit which gave it forth" (17). Similarly, music is to be experienced; a melody enjoyed. When a composer writes a piece of music, he intends for it to be experienced as a whole, not dissected and broken down into a series of different frequencies of vibrations. As William Wordsworth so wisely noted in "The Tables Turned," "We murder to dissect," or as Bergson might say, we remove the life, attempt to study the force, and still expect to understand the "life-force."

As Stromberg reflects on Bergson's philosophy, he states that "reality is indivisible and hence unanalyzable; insofar as we do analyze it, as for convenience's sake we must do, we falsify it" (180). Thus, claims Stromberg, "Immediate experience is deeper [than scientific dissection] and forms
the matrix within which intellectual knowledge takes place (182). And Emerson states in his famous "American Scholar" address, "It [experience] is the raw material out of which the intellect moulds her splendid products" (46). Although Stromberg views experience as a "matrix," and Emerson views it as "raw material," both see the necessity of experience in understanding life; the breadth of experience, in either case, determines the capacity for the depth of understanding.

The approaches to intuition from Kant to Bergson are reactions against the emphasis on science and may therefore seem a bit too extreme concerning the role of intuition in life. However, we should not forget that others, such as Aristotle, have been able to combine, and even balance intuition and science. Science is not necessarily opposed to intuition, although it is certainly less common to find scientists who firmly believe in intuitive inspiration than to find poets or philosophers who do. If some of the previous approaches to intuition seem too mystical, or simply not scientific enough, the approaches given by the following three scientists on the role of intuition in their fields may prove more acceptable.

One such approach to intuition's role in science is found in Kekule's own account of his experience upon discovering the benzene ring in 1865. Bunge relays the account of the dreamy Kekule sitting in front of his fireplace.
My mental eye, sharpened by repeated visions of a similar sort, now distinguished larger structures of varying forms. Long rows, frequently close together, all in movement, winding and turning, like serpents! And see! What was that? One of the serpents seized its own tail, and the form whirled mockingly before my eyes. I became awake, as though by a flash of lightning. This time I spent the remainder of the night working out the consequences of the hypothesis. If we learn to dream, gentlemen, then we shall perhaps find truth... We must take care, however, not to publish our dreams before submitting them to proof by the waking mind. (83-4)

This account depicts a scientific man who had been working for an extended period of time on a difficult chemistry problem. He had a great deal of knowledge in the field, and yet he could find no logical solution for this problem. "Up to that time the molecular structures hypothesized had all been linear chains," states Bunge (83). However, when he fell into a semi-conscious dream state, he allowed his scientific knowledge to be manipulated by his intuition. His intuition, the pre-conscious mind, the faculty which allows and encourages free and creative thinking, led him to the answer. Some might call it luck, but often times luck is nothing more than preparation (his training in chemistry) meeting opportunity (offered by intuition). This pseudo-scientific application of intuition is supported by E. W. Sinnott when he claims that "such inspirations... rarely come unless an individual has immersed himself in a subject. He must have a rich background of knowledge and experience in it," but "without this flash the creative process might never have been able to get started" (24-5).

Kekule's final statement—that "We must take care... not to publish our dreams before submitting them to proof by
the waking mind"—is evidence of Comte's third stage, but it
does not detract from the importance of the dream. Without
the dream, the intuitive inspiration, there would have been
nothing to submit to proof by the waking, logical mind.
Kekule's pseudo-scientific approach to intuition seems as
justifiable as Plotinus' mystical approach. However, for
those who require more scientific explanations, Kekule's
account may be more satisfactory, as may be the next two
examples.

In 1946 A. Henderson did describe intuition as a "god-like"
quality which the scientist shares on equal terms with
the artist.
The history of mathematics and natural science is filled
with illustrations of the spectacular display of
imagination and intuition... Imagination, fantasy,
intuition, discovery by mental lightning flashes,
constitute the supreme creative faculty or faculties of
the scientist. The great scientist shares this god-like
quality on equal terms with the poet, the dramatist, the
painter, the sculptor, the philosopher. (457)

And, Steven Weinberg, a modern physicist, claims that
today's scientists do not believe in the naive inductivism
of Francis Bacon which holds that in order to make true ob-
servations, they should approach whatever is being studied
with no preconceived ideas and that they should observe ob-
jectively. Weinberg states that "scientists rely, a tremen-
dous amount, on guess work, insight, philosophical preconcep-
tions, and esthetic judgements." He also holds that the
scientific development of theories and scientific judgement
of theories is based on an instinctive sense of beauty.

For Weinberg, this sense of beauty comes not from the sym-
symbols on the page, but from an understanding of what the symbols mean, how they fit into a larger context, and how they work together. For Weinberg, a theory is beautiful if it cannot be any other way than it is: such is the case with Einstein’s General Theory of Relativity, which Einstein himself described as beautiful.

Thus, today we have clearly moved toward a more empirical approach to life, but even the best of our scientists still rely on an intuitive sense to guide and inspire their work. Empirical knowledge itself is relative to the constructs which man has developed to help him understand this world, including the language he has developed to explain it. Every human mind starts from certain accepted facts (our assumptions) such as the stability of nature: the trees in front lawns do not disappear or turn into rocks while the mind sleeps, nor do dining tables and chairs become cats and dogs while the bodies are at work. Humans trust in their senses for, although they know that their senses can be deceived, they know that they can correct the deception with their other senses or with reason. A stick half submerged in water appears to be bent, but the hand can touch the stick and know that it indeed is straight, or the mind can reason to understand the properties of water and thus explain why the stick appears to be bent. Even if all the world is an illusion, it is a stable illusion and humans accept its stability as their reality. Science continuously attempts to prove the stability of the universe, but in the meantime humans, by some non-scientific means accept and be-
lieve in its stability. If they did not, all attempts to understand the world would be futile; the mind could know nothing.

However, concerning that which lies beyond scientific proof, those things must be grasped by some other means. This other means of acquiring knowledge is necessarily ambiguous because it is not observable, predictable, or even infallible, and because it lies outside the realm of logic and scientific thought. What lies beyond consciousness is unknown, but some do occasionally catch glimpses of it and sense its presence. When it is described, ambiguous terms must be used, for if it were any other way, it would be logical and therefore fully understandable.

As a result, a means of acquiring knowledge, such as intuition, is needed in order to deal with the ambiguities of life, for without it no one could begin to conceive the soul, love, beauty, faith, passion, or any of the hundreds of other intangible and illogical elements that are intricately woven into life. While intuition allows individuals to contemplate these elements of life, it is not limited to the intangibles; it is, as Weinberg and Aristotle argued, also useful and necessary in more practical ways.

Intuition allows mankind to think unthinkable thoughts and ask unanswerable questions, thus transporting man beyond the realm of the probable into the realm of the possible. In the realm of the possible is found that which gives humanity new technological breakthroughs. Intuitive thinkers have dared to look beyond what is logical and practical to
that which seems, at least on the surface, illogical and impractical, but nonetheless possible. Bastick claims that "the intuitions of great men, the 'Eureka' experiences that have pushed forward the frontiers of knowledge, that have produced technologies moulding our civilization, are inspirations to the schoolboy, are guiding lights to the research worker" (1). Thus, intuition may possibly be the most valuable tool available to all men. Newton and the apple, Archimedes in the bath, Pythagoras gazing at his tiled wall are but a few examples of men whose intuitive inspirations have changed the course of human events.

Intuition pervades every aspect of life, from our day to day hunches to the newest scientific breakthrough. And while our day to day hunches may not seem very important compared to the "Eureka" experience of a genius, nor change the course of human events, they are important to our personal lives and to our understanding the world around us. In the end, intuition is as critical to configuration as it is to communication and as important to syllogism as it is to symbolism.

Chapter 3: Characteristics of Intuition

One of the most poignant and controversial topics throughout history has been Epistemology. Writers have discussed and argued the questions of how man acquires knowledge and the limits of that knowledge since the beginning of recorded history; their opinions and theories are as different as playgrounds and battlefields. No one has yet offered a logical and empirically sound theory on the acquisi-
tion and limits of knowledge, which is where the Intuitionist has an advantage.

Most Intuitionists do not deny the need for logical thought nor the acquisition of knowledge through logic, but many do believe in a non-scientific means of acquiring knowledge which is often viewed as an equally respectable, if not more accurate means of acquiring knowledge. The Intuitionist refuses to be bound by definitions and theories which are logical and empirically sound because these processes, while unsurpassed in their own temporal realm, are limiting to the free and creative thinker. Intuitionists believe in a means of acquiring knowledge which cannot be defined, but can be characterized by such properties as non-rational (in the scientific sense), unprovable (again in the scientific sense), varient, and fallible. One should hardly wonder at the Intuitionist’s inability to offer a logical and empirically sound theory on the acquisition of knowledge when it is understood that he believes knowledge is, in part, acquired by a process which is itself not logical or empirically sound.

Since no one has determined exactly what intuition is, it would be futile to attempt a definition. However, since definitions are necessary for dictionaries and useful for those who require only the vaguest notion of such concepts, *The American Heritage Dictionary* (Second College Edition) defines intuition as "the act or faculty of knowing without the use of rational processes; immediate cognition." And *Webster’s Third New International Dictionary* defines it as
"Revelation by insight or innate knowledge, a form of knowing that is akin to instinct or a divining empathy and gives direct insight. Quick and ready insight. The act or process of coming to direct knowledge or certainty without reasoning or inferring." These "definitions," at best, vaguely hint at what intuition is; still they are inadequate: they perpetuate negative connotations of the concept such as irrationality, and they merely constitute some of its characteristics.

Guiora's explanation of intuition is, perhaps, closer to the concept of intuition posed in this essay than the dictionary attempts. Guiora claims that:

Intuition is the result of a process of making an apparently direct, immediate and accurate judgement and/or prediction--fashioned out of idiosyncratic associations reached through allo-logical [i.e., different from scientific or purely logical] principles--that has been set in motion by an amount of immediate external cues, normally inadequate for a logical judgement and/or prediction. (119-20)

This explanation, though still incomplete, offers a more accurate view of the concept and points to some of the characteristics which will be discussed later in this chapter.

Granted, intuition, by its very nature, cannot be defined, for to define it is to draw lines around it, box it in, and limit it. Intuition is more than a form of telepathy or psychic ability, and although these may be included in intuition, they do not constitute the basis for such a concept. Any description of intuition must account, as Guiora's begins to, for its ability to make decisions when circumstances are ambiguous and the mind lacks sufficient input to make a log-
tical decision. It must clearly be seen as a function that activates the imagination and inspires creativity, offering glimpses into the nature of the soul, the purpose of life and of what is beyond life, filling the gaps of logic by allowing individuals to see what cannot be seen and know what cannot be empirically known.

Intuition is a great many things, and any time the human mind attempts to explain it or understand it in logical terms, the essence of the concept is lost because it is beyond full logical explanation. When an individual does catch a sudden and occasional glimps of it, he almost immediately attempts to grasp it, hold it, and understand it logically, but when this is done, a general principle of intuition has been violated—that it lies outside the realm of logic. Still it is important to engage in the dialectic process, trying to glimpse and outline some of the characteristics associated with intuition. Four follow below.

First, intuition is non-scientific, yet it is rational, an idea which contributes to the ambiguity of the entire concept. Scientific thought (pure logic) follows a particular rational pattern which happens to be linear—its inferences follow in syllogistic patterns. Likewise, intuitive thought follows a particular rational pattern, although it is not linear, but rather a network, a web, a quiltwork pattern of associations and inferences. Networks are a difficult concept to "understand" because they are unique for each individual—they take into account personal experience and emotional associations which may or may not be conscious.
to the individual. With this in mind, we should be able to see why intuition is important in daily life—all of our assumptions, judgements, and decisions are biased, if not completely based on these personal factors. And, if we see intuitive thought as a mental activity which takes place within a network, then we can begin to understand the complexity of the concept and the difficulty we experience when attempting to logically explain it.

Another factor which contributes to the difficulty of explaining and attempting to understand intuition is the emphasis on linear thought in our society. Not only is logic linear, so are time and language. When we speak or write one word must follow another, sentence after sentence, paragraph after paragraph, and so on. However, when the human mind is in the thinking state it does not always follow in this manner.

Second, intuitive thought, as the first characteristic implies, is a holistic process. Hence any intuitive insight "suffers" in translation—that is from the holistic nature of the insight to its expression in linear language. For example, a father holding his newborn child will experience any number of thoughts and feelings about that child, but if we would ask him to express his thoughts and feelings in words he would surely find it a most difficult task, if not entirely impossible. In The Republic, Plato did value what he called "insight" which is immediate and holistic. And language, as Plato saw it, was incapable of translating this insight. The mind often operates holistically rather than
analytically, processing clusters of ideas rather than analyzing each individual bit of information. When individuals think, the mind makes many connections which do not necessarily follow in logical progressions, but rather follow a more complex pattern within a network of ideas—network meaning webs of interconnected ideas which may even overlay one another.

A simple exercise known as "clustering" illustrates this point (Trimmer and McCrimmon 28-30). As Figure 1 illustrates, many processes of the mind in the thinking state are not logical, but they do form patterns thus constituting a rationality, although the rational is not always logically decipherable. J. S. Bruner claims that "intuitive thinking characteristically does not advance in careful, well-planned [logical] steps. Indeed, it tends to involve maneuvers based seemingly on an implicit perception of the total problem [holistic thinking]. The thinker arrives at an answer . . . with little if any awareness of the process by which he reached it" (57-8). Thus, the activities of the mind are not always conscious processes—not conscious in the sense that the steps cannot be retraced and thus cannot be logically analyzed.

The holistic nature of intuition especially allows the mind to embrace diverse ideas and find harmony in opposites. Holistic thought can recognize a more complex order than can analytical thought, a oneness that reveals how opposites turn upon themselves to create the oneness from whence they came. For example, we may consider science and art opposites
Communication is a difficult process. If I have a thought and wish to share it with someone, I must use words that we both understand. (It helps if we speak the same language.) This can still be difficult because words vary in meaning among people. However, if we can get beyond the ambiguity of the language and actually communicate, we then may learn and grow. This growth may be minor, but the progress of our culture depends on the growth of its individuals.

Notice that the above cluster offers many possibilities for exposition. The paragraph above is a quick attempt to grasp the essence of the cluster in the linear progression of language. However, there are many details in this thought pattern that would require a major work to explain. Furthermore, the above paragraph is only one possible means of getting at the essence of the cluster.
because science engages in logical processes which are supported by empirical evidence while art engages in imaginative, creative processes which require no proof or verification. However, both science and art originate from the same source, ambiguity, and strive toward the same end which is an attempt to interpret the world and find the basic principles which constitute the unity of existence, thus eliminating the ambiguity. If the scientist believes that basic principles, when found, will be fundamental laws of nature, and the artist believes basic orders to be beautiful, both are correct; in the end, it is all one. Weinberg is on the right track when he claims in his lecture "Beautiful Theories" that when the fundamental laws of nature are found they will be beautiful.

E. A. Messer in her book *Children, Psychology, and the Teacher* says, "intuition is . . . an active creative process, which comes into play when judgements are made without conscious decision" (40), which shows some support for associating intuition with creativity, the third characteristic. In this sense, creative intuition may be exemplified by considering an artist as he chooses which colors to use in a painting and precisely where and how to apply the paint to the canvas, decisions which are not made by logical processes. Further connections, however, can be made between intuition and creativity.

Intuition activates the imagination and hence inspires creativity—the ability to see new possibilities and then act so as to bring the vision into existence. The ambiguity
of intuition allows for multiple interpretations of any given subject, and any individual who allows himself to break free from conventional beliefs has the capacity, as Emerson claims in "Nature," to "come to look at the world with new eyes" (38). And in "The Poet" Emerson states that "the highest minds of the world have never ceased to explore the double meaning, or shall I say the quadruple or the centuple or much more manifold meaning of every sensuous fact [networks]; Orpheus, Empedocles, Heraclitus, Plato, Plutarch, Dante, Swedenborg, and the masters of sculpture, picture and poetry" (122). However, those who do break free from conventional thought must also be capable of expression if their creativity is ever to come to fruition. As Aristotle might say, inspiration without application is barren for it produces nothing, and Emerson says that "The man is only half himself, the other half is his expression" ("The Poet" 122). The creative man must not only see clearly, he must articulate what he sees and act as interpreter for those who cannot see and those who cannot express what they have seen.

The author of a masterpiece, in constructing his work, must use words, for they are his only tools. However, the genius of the artist is his ability to see beyond the linear progression of the words to the larger picture— the network of ideas, to manipulate the words, to cast new light on old ideas, and to create new images out of the language. Almost anyone can write; the act of "writing" itself is nothing more than transcribing words on paper. But it takes an inspired individual to create; creation requires imagination and imagination is born of intuitive inspiration.
The fourth characteristic of intuition is its ability to embrace contraries. Our society is so accustomed to dichotomies that an attempt to break them down seems a rather dangerous venture. But I fail to see why things must be black or white, when they might, in fact, be black and white, or even grey. Why must we build walls between sides and require people to choose one or the other when they may wish to choose one side first, and then the other? Peter Elbow argues for a resolution to this problem in his book *Embracing Contraries*.

Elbow claims that "contraries can interact productively instead of fruitlessly fighting or conflicting with each other" (233). Elbow explains, "If I push an object away from me and pull it toward me at the same time, it doesn’t move and my effort is in vain" (233). However, if the mind engages in a debate, each side fully arguing its points, some progress will surely be made. "If I argue wholeheartedly for X and then wholeheartedly for not-X, I can count on getting somewhere in my thinking. At the larger level of temperament, I don’t have to try to decide whether to be a logical or an intuitive person, I can invite a productive alternation between those qualities" (234). Many aspects of life are difficult, and Elbow suggests:

it’s probably because contraries are called for. . . . Thus, good writing is hard because it means trying to be creative and critical; good teaching is hard because it means trying to be ally and adversary of students; good evaluation is hard because it means trying to be subjective and objective (seeking both reader-based and criterion-based perceptions); good intelligence is rare because it means trying to be intuitive and logical. (234)
And according to Elbow, we make more progress when we find "some way to do justice to both sides in their opposition" (234), than when the two sides come to a compromise.

Individuals concerned with the "subjective versus objective truth" debate might like to know on which side of the fence I place intuition. However, as is often the case, my answer is neither and both. I believe the "subjective versus objective" debate is nothing more than a dichotomy born of the split in logic (what -vs- why), the same separation which gave rise to the "nature versus natural order" debate. The distinction only exists because man has created it, and only by breaking down this man-made dichotomy can we reach an understanding of a system whereby logic and intuition are equally respected and embraced.

Whether or not we understand this type of system which combines logical and intuitive thought, we do use it. Intuition, in its base form is used to make assumptions and intuitive judgements. Bigge and Hunt claim that "intuitive judgements are hypotheses based on personal convictions, supporting evidence is hidden and vague. Intuitive thought does not make use of publicly verifiable data, runs no tests on its hypotheses and totally ignores the fact that its assumptions may be false or debatable. The subject believes his assumptions to be true" (105). This is true even for the scientist, although the scientist will eventually submit his intuitive judgement to logical "proof by the waking mind." Intuitive thought at its pinnacle, however, will operate more closely to Kekule's experience. As R. M. Gange
Thus, we should now see intuition as a rational process which differs from scientific logic in that pure logic follows linear inferences whereas intuitive thought takes place holistically, within networks. Furthermore, intuition has its place in the creative process, and allows individuals to be intuitive as well as logical by its ability to embrace contraries. Intuition, indeed, has a logic, a rational basis, although it is most assuredly different from the scientific logic that has become so much a part of our lives. Nevertheless, intuitive thought and logical analysis can and do work together, if we will allow it. Z. A. Piotrowski states that "in every empirical reference of a concept, there is an intuitive, non-rational, qualitative element—non-rational meaning, everything that cannot be duplicated by a mechanical device" (12).

From all that has been said about intuition here we can see why intuition is associated with ambiguity. According to The American Heritage Dictionary (Second College Edition), ambiguity is defined as "Susceptible of multiple interpretation." For the logical mind ambiguity may pose a difficult problem because logical minds tend to want thought to follow in close deductive patterns, while for the creative mind, ambiguity is where life begins. If there were only one possible interpretation for each idea, then all the world would be at peace, and the artist as well as the scientist would soon be out of work, for there would be only one view of the
world and one possible path to follow.

From the earliest recorded history mankind has been striving to understand and improve both himself (personal progress) and his world (social progress or technology). Some attempt to do this through science, some through art, some through religion, and some through a combination of these methods. Regardless of what method man uses, it seems clear that progress is a human need, and the first step toward progress is the recognition of the ambiguities of life, ambiguities which are often stirred by our intuitive sense.

At my house saying "I don't know," will almost inevitably lead to a major discussion whose purpose is to find the answer. Of course, we do not always find the answer we look for, but we usually learn a great deal about the problem in the process of searching for the answer. Most of us do not like ambiguity. We want definite, concrete, logical answers to all of our questions (the curse of Comte's third stage). We seem to recognize ambiguity as an adversary that must be eliminated. When an idea or a situation is ambiguous we lose the sense of order and control that we try to maintain in our world; the Emersonian ideal that there is nothing we cannot know is threatened and there is little we will not do to regain order and control. Still, though we do not like ambiguity, we must acknowledge its advantages because it is an essential element of growth and development.

Suppose for a moment that life is completely void of any ambiguity. Now, we can assume that we either know everything there is to know, or we are too ignorant to doubt, question,
or even think. Ambiguity is essential for the growth and development of our personal lives as well as the advancement of our culture because without it we would stagnate. Logic does not allow us to ask new questions because pure logic does not ask for new input, only using what it has. Once the questions have been asked and all input is available, then logic is the means by which we make sense of the input and eliminate the ambiguities. But first the questions must be asked, and since intuition assumes nothing more than the fact that ambiguities exist, it is always open to new ideas and is ever ready to ask new questions. Without intuition to capitalize on ambiguity we would still be discovering our thumbs instead of occasionally sitting on them.

The ambiguity that arises out of intuition causes us to think. We all have moments when we are on top of the world, when our lives seem to be organized, coherent, and comfortable. When this happens we have a sense of harmony and equilibrium, a sense of purpose and direction; everything works and everything fits into place. Humans generally do not move until they become uncomfortable and ambiguity creates that discomfort, disrupts a coherent world, and violates all sense of organization. Harmony is lost and the equilibrium destroyed. Just when we find all of life's answers, ambiguity creeps in, our intuition engages, and we begin to wonder if we have the right questions.

Ambiguity causes us to rethink and reorganize life in light of the new information or questions that our intuitive sense brings to the surface. Because ambiguity leads us to
think, it almost always leads us to a deeper understanding after the results of our search have been thoroughly digested and assimilated. Ambiguity gives rise to puzzles that, for a time, appear to be complete. At that time we feel comfortable; everything in our world seems to fit into place. Then we find some new pieces and we must decide what to do with them. We can try to squeeze them into the picture we already have, we can just attach the new pieces to the edges, or we can reshuffle and expand the old picture to form a new one.

The intuitive sense and ambiguity inspired Socrates, Plato, and Aristotle to explore concepts such as truth, beauty, love, freedom, and the soul. They caused Locke to question his own existence, and they have encouraged man to explore the depths of the oceans and the great frontier of space. Now it is time to fully explore the final frontier, the human mind, for as the ancients believed, "the proper study of man is man" and until we fully understand ourselves, we will never unlock the secrets of the universe.

Intuition may indeed be the most valuable tool available to all men, but it is still one of the most underrated and underdeveloped of all the tools man possesses. The greatest thinkers throughout history have displayed an ability to integrate (or alternate) intuitive and logical thought, but as a whole, our society has become empirically lopsided. When our culture finally recognizes the need for intuitive thought and begins to integrate it with the highly developed logical processes which already exist, then we may find humanity at
a higher level of thought than we ever imagined. But first, we must come to an understanding of intuition. Until we understand what it is and how it works, it will be very difficult to make any conscious effort to integrate intuition with logic. We know that logic is a powerful tool, but we have hardly begun to discover the possibilities that exist within intuitive thought. Logic is merely one means of coming to knowledge, although we do not know if it is necessarily the best means. We cannot disregard logic nor intuition; we need logic as much to make sense of our intuitions as we need intuition to inspire and direct the content of our logic.

Chapter 4  Intuitive Prospects

In the three previous chapters we have, hopefully, come to a better understanding of the concept of intuition as well as its importance in modern culture. We are now faced with the question of what to do with what we have. What can we do? What should we do? What will we do? Respectively, anything, everything, and probably very little, if anything at all. But still, there is hope.

The first necessary step toward dealing with intuition is to purge our minds of the negative connotations attached to intuition. Intuition in Western Culture has, for a variety of reasons, developed a questionable reputation and is therefore often ignored by those who could do the most good with the concept. "Faced with a bewildering array of meanings and connotations for the word intuition, some educators
have, unfortunately, chosen to ignore intuition completely or treat it contumulously as a catchall for any process not easily described as logical or linear" (Noddings and Shore 2). With such attitudes toward intuition the concept is in danger of simply becoming "one more sensational, unconfirmed phenomenon lingering at the borders of educational respectability . . ." (Noddings and Shore 40). Intuition can be dealt with on a serious level only if we can eliminate the negative connotations that have, for too long, been associated with the term. Once this has been done, or perhaps because it must be done, we will need to, ironically, come to a logical understanding of intuition.

Even though intuition, as I have characterized it, cannot be understood fully in logical terms because its processes are not always readily available to the conscious mind, we must find a means by which we can deal with the concept logically. If we do not, we may forfeit the opportunity to consciously and purposefully incorporate the benefits of intuition into practical life. Noddings and Shore claim that intuition "can be a validated and useful part of a skilled educator's repertoire," but "what direction the investigation and utilization of intuition will take depends on the conscientious efforts of teachers to encourage intuitive thinking, become familiar with its strengths and uses, and defend intuition from critics who deride it as merely sloppy or inaccurate thinking" (40). Thus, we clearly need to find ways to foster intuitive thought, though first we need to understand it. Research can surely lead to such an under-
standing as well as reveal some pedagogical methods.

For example, research could help to determine if, as is commonly believed, women are more intuitive than men. And, if indeed they are, what implications might that have on elementary education, "where the overwhelming majority of teachers are women" (Noddings and Shore 39). Carol Gilligan's book on psychological theory and women's development, *In a Different Voice*, offers some interesting possibilities and insight into developmental theory. Gilligan attempts to show some of the differences between male and female thought (although not specific to gender) and some reasons for those differences.

Female thought is often viewed as illogical and irrational, and because women rarely fit traditional psychological theories, they are often considered developmental failures. However, as Gilligan points out, this may be a result of:

[psychological theorists hav[ing] fallen . . . into the same observational bias. Implicitly adopting the male life [male thinking--logic] as the norm, they have tried to fashion women out of a masculine cloth. It all goes back, of course, to Adam and Eve--a story which shows, among other things, that if you make a woman out of a man, you are bound to get into trouble. (6)]

Thus, for Gilligan the problem does not necessarily lie with women, but more likely with the male oriented psychological theories. If we can eliminate the old biases and come to see women as thinking more holistically than is typical of men, then we will better understand that which may appear to the logical mind as irrational behavior. According to Gilligan, men often view life situations within a "hierarchy of
rights [logical and linear]," while women tend to act within a "web of relationships [networks, more holistic]" (57). Women may, therefore, be seen as more intuitive than men, and may indeed be more intuitive because of their nurturing role in our society which fosters characteristics of intuition such as networking and holistic thinking. Of course, we need more research in this area to verify such hypotheses, but the foundation for this research is being laid by works such as Gilligan's.

This kind of research is applicable to men and women alike. Intuition, like so many things, can be applied to several different specialized areas, and women's intuitive abilities is merely one area. We should concentrate just as much on intuition as it applies to the general population--the intuitive concept as a whole. In any case, is seems certain that we must clarify what is meant by intuition because, until we know what it is, we can hardly expect to know what to do with it.

As with gender research, other research could help to determine any connections between intuition and cultural background, religious training, or heredity. There are many possibilities, but researchers must first see intuition as a valid and worthwhile concept, which is precisely why we must attempt to find logical explanations for intuition.

The implications of intuition in education, the social sciences, and in the scientific field in general are promising and the stakes are too high to neglect the need for further research on intuition. Intuitive prospects are unlimi-
ted, but we must first recognize the need for the integration of intuitive thought into our empirically-based society, and the possibilities that intuition offers to the progress of mankind.

Since man is typically a curious creature—desiring to know and understand that which he does not know—ambiguity plays an essential part in the growth and development of the human race. And with all of the ambiguity which surrounds the concept of intuition, humanity has a tremendous potential for growth. We must do our best to eliminate the ambiguity of intuition, at least to the extent that we can communicate reasonably about the concept; only then can we consciously integrate it into the aspects of daily life where it can reach its fullest potential. We need, as the great thinkers have shown, a combination of intuitive and logical thought, for as intuition without logic is unproductive, so logic without intuition is aimless and therefore meaningless.
NOTES

1 Although Weinberg does not use the word "intuition," the intent is the same in that his "instinctive sense of beauty," like intuition, cannot be expressed by a logical or linear tracing of steps, but is rather based on a holistic approach (see chapter 3).

2 It's a relief also to find reputable backing for this view of opposites. Yeats: "No mind can engender until divided into two." Niels Bohr: "The opposite of a correct statement is a false statement. But the opposite of a profound truth may well be another profound truth." F. Scott Fitzgerald: "The test of a first-rate intelligence is the ability to hold two opposed ideas in the mind at the same time and still retain the ability to function" (Elbow's note, 234).
WORKS CITED


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