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Making Meaning with Synesthesia: Perception, Aspiration, and Olivier Messiaen's Reality

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MAKING MEANING WITH SYNESTHESIA:

PERCEPTION, ASPIRATION, AND OLIVIER MESSIAEN’S REALITY

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ABSTRACT

This thesis explores the phenomenon of synesthesia through recent psychological research and the writings of Olivier Messiaen. Synesthesia is a “union of the senses” by which a stimulus in one sensory mode elicits a response in another. For example, a synesthete may hear music and involuntarily “see” colors within their mind’s eye. Synesthesia has also been a Romantic metaphor for the union of the mind and soul. Both understandings of synesthesia involve a process of making meaning, which has potential bearing on the development of worldview. It is important to understand this implication in the life of a synesthetic musician.

Currently, psychologists agree that synesthesia, in its various forms, is integral to a person’s meaning-making processes. That is, the multi-sensory experience of an object or concept cements the person’s relationship with that object or concept. All humans may be synesthetic to some degree and form these meaningful relationships via multisensory understanding. Accordingly, the most frequently reported synesthetic phenomena consist of color linkage with vehicles of communication such as letters, numbers, and music. It is then useful and enriching to apply this knowledge to the history and biography of known synesthetes.

To establish familiarity with synesthesia, this project includes a history of scientific inquiry into the condition, culminating with a growing interest in cognitive psychology. We will also discuss the importance of literal and metaphorical synesthesias to artistic pursuits; synesthetic artists of the nineteenth and twentieth century often interpreted their visions as signifiers of spiritual meaning. Finally, we will approach the composer Olivier Messiaen (1908-1992) and examine the role of synesthesia in his worldview and compositions. By examining his own synesthesia – his own moments of “overwhelming truth” – we can better understand how Messiaen used synesthesia to connect spiritual and real senses, to make meaning of his world
with his multi-sensory perception. This understanding of synesthesia’s effects can enrich the process of writing a person’s history and may ultimately shed light on how both synesthetes and non-synesthetic musicians make meaning.
CHAPTER ONE
SYNESTHESIA AND SCIENCE

Introduction: Why Synesthesia?

This thesis explores the phenomenon of synesthesia as a literal biological process, a metaphorical language, and a Romantic artistic vision through the writings of Olivier Messiaen and recent research in neuropsychological literature. Synesthesia augments a person’s sensory experience by compounding senses; for example, a person may visualize a color when tasting a glass of wine or perceive that a numeral has a gendered personality. Synesthesia is involuntary and may involve any number of sense couplings. In addition to its various manifestations, synesthesia's associations may occur within the mind’s eye or they may seem to be projected externally onto objects. For example, the wine’s flavor may be accompanied by a deep green in the synesthete’s visual field, though a numeral’s personality of a shy young girl may be felt and not seen. Whether projected upon external objects or internally experienced, the perceptions are real.

Little historiography exists on synesthesia within the arts. This is partially due to a lack of informed medical reports in earlier times as well as a deeply-rooted tendency to mystify a perceived abnormality. In general, synesthesia has been called everything from a disease to a paranormal phenomenon, a perspective which persists to some degree even though synesthesia is now known to be a harmless natural occurrence. Synesthesia was first reported and misinterpreted as a psychological disorder in the early nineteenth century. The allure of involuntary visions, however, was too strong for hashish users, some of whom induced synesthesia for their own pleasure, others for direct study of mental disorder. In the later nineteenth century and early twentieth century, painters, dancers, musicians, and actors
collaborated in artistic productions imitating synesthetic experiences, unifying the arts in the name of a larger synesthesia. Romantic thought latched onto synesthesia as the perfect bridge between the rational mind and the emotional soul, freeing the self from the rigidity of prevailing Rationalism.¹

Synesthetic artists of the twentieth century often interpreted their visions as signifiers of spiritual meaning. One notable example is the painter Wassily Kandinsky (1866-1944), who published *On the Spiritual in Art* (1911), encouraging artists to employ the resonances of color to lead others to awareness of spiritual forces. Olivier Messiaen (1908-1992) was another man of faith whose synesthesia formed the basis of his mysticism. A devout Roman Catholic since boyhood, Olivier Messiaen expressed religious themes in virtually all of his compositions. During World War II, he was drafted into the French army, then captured and held in a German prisoner-of-war camp from 1940 to 1941, an experience which reinforced his faith and future compositional maturity. After his release, Messiaen’s compositions largely dealt with religious events and themes of joy, light, and redemption. Scholars of Messiaen’s music have often used his theoretical treatises as tools with which to analyze his major works. In the last ten years, however, Messiaen scholars have focused more on his theological and general world-views to explore how the composer conveyed ecstatic encounters in his compositions.

One particularly strong influence on Messiaen’s compositional choices was his sensitivity to the colors of sound. Messiaen possessed chromesthesia, the synesthesia of visual color associated with sounds. This phenomenon is usually discussed briefly in Messiaen literature as a titillating bit of abnormal perception, though his colorful music and noises were fundamental to his worldview. When he composed musical versions of spiritual visions, he often used a wash of

tones and sound in order to evoke the effect of a rainbow or a stained-glass window. By examining Messiaen’s synesthesia we can better understand how he used synesthesia to connect spiritual and real senses and to make meaning for listeners. Ultimately, this condition that seems so ethereal leads us to question the role of perception in forming one’s sense of reality, not only for Messiaen, but for synesthetic musicians and artists alike.

What is Synesthesia?

The term synesthesia comes from the Greek syn (union) and aesthesis (sensation), meaning “union of the senses.” A literal synesthesia exists in which the sensory input from one mode elicits a response from another mode. In such a case, one person may feel a prickly sensation in their hands when they taste a certain flavor; another might see a ribbon of red light cross their vision when they hear a clarinet melody. The words “crossmodal” and “intersensory” both refer to the cross-activation of the senses and will be used throughout this thesis. This union of the senses has been explored using language, art, and metaphor for centuries but it has only been considered within the fields of psychology and neuroscience relatively recently. Into the nineteenth century, visual synesthesias were considered the product of eye problems or an overactive imagination. The ability to monitor brain activity through technologies such as fMRIs (functional magnetic resonance imaging), however, has confirmed that synesthesia is actually a phenomenon of the brain, concerning perception rather than the imaginative resources of the mind.
The prevalence of synesthesia is startlingly unclear: estimates range from 1 in 20 to 1 in 25,000. This is due to the variety of possible synesthesias as well as the likelihood that many synesthetes are unaware their perception is not normal. What’s more, the definition of “sense” has also become more comprehensive than the standard group of hearing, sight, taste, smell, and touch. The five primary senses can be dated at least to Aristotle, who linked each sense to a sensory organ; this practice influenced generations of scientists and scholars until the Enlightenment. Today’s definition of senses also accounts for the chemical and mechanical senses that humans are able to perceive. These include the senses of balance, temperature, and pain, reaching a total of approximately twenty-one senses. These additional senses generally operate without our direct attention but may also be included under the umbrella of available synesthetic connections.

**Early Investigations of Color Associations**

Out of the many possible kinds of synesthesia, the most common elicit the sensation of colors. Color associations with other natural phenomena have been incorporated into scientific principles for centuries. A great deal of time could be spent here on a discussion of Ancient Greek music and color theory, which combined science, aesthetic principles, and spiritual dimensions. Pythagorean color theory, for instance, found music at the service of mathematics and a universal order. The ratios of plant growth and musical intervals were also governed by principles of harmony, which were in turn determined by reason and mathematics, not taste or

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2 Sir Francis Galton estimated 1 synesthete out of 20 people in the 1880s, but in 1994, Cytowic extrapolated from surveys in North America to estimate prevalence at 1 in 25,000. In 1993, surveys conducted by Simon Baron-Cohen in the UK placed the estimate at 1 in 2,000 and 1 in 2,500. There is no conclusive evidence of prevalence based on geographic location. Richard Cytowic, *Wednesday is Indigo Blue* (Cambridge, MA: The MIT Press, 2009), 7-8.


4 Ibid.
According to the Pythagoreans, colors and tones were active forces and helped establish the universe. The color red was the same as the lowest note of a musical scale (do) and held the planets in their orbits. The symbols and proportions of Greek art would follow this mathematical order since every natural creation was connected. The Greek concept of interrelatedness also consisted of an immediate connection to the gods and spiritual forces of the cosmos through a grand metaphorical synesthesia.

Since the mathematical inquiries of the Pythagoreans, there have been numerous attempts to empirically define or approximate the relationships between color and sights or sounds. Some notable investigations come from experiments undertaken during the age of Enlightenment. Both John Locke (1632-1704) and Isaac Newton (1642-1726) are considered early investigators of synesthesia, though they were mainly concerned with the physics and philosophy of perceptual issues indirectly related to synesthesia.

John Locke was curious about the now-classic Molyneux problem: if a man born blind were to receive sight, would he then be able to recognize objects by sight alone? Locke’s philosophical-empirical approach, based on his personal observations and the separation of the five senses, continued to emphasize the discreet operation and function of each sense. He concluded that the blind man must first have the sensory capacity to understand the perception that would come through that sense channel, so his answer to the problem was “no.” The tactile knowledge of an object would not be related to a visual knowledge of the same object. Locke also believed that man must derive knowledge only from what he can conclude through his own

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6 Manly P. Hall, *The Secret Teachings of All Ages.*
7 William Molyneux (1656–1698), an Irish scientist, sent Locke a letter in 1688 asking him this question.
sensory experience. Although his position was extremely relativistic, the twenty-first century would confirm that different areas of the brain generally handle different senses.

In 1704, Sir Isaac Newton tried to relate sounds and colors by measuring their energies.\(^8\) He figured that sonic wavelength corresponds directly to light wavelength and thus the visible spectrum of color. His mechanistic approach to natural phenomena led him to connect the seven basic colors (red, orange, yellow, green, blue, indigo, violet) with the seven basic intervals of the musical scale. Newton did not aim to prove the connection of the senses but rather the physical properties of energies. In the same vein, eighteenth-century musicians built carefully calibrated musical instruments with a one-to-one tone-to-color display. In 1742, the first color organ was built by Louis Bertrand Castel. He called it the *clavecin oculaire*, an organ which projected light through colored glass panes. Each key was connected to a small curtain which moved to reveal the corresponding color pane. Assorted color organs were crafted well into the twentieth century, incorporating electric lights as they became available. Scriabin meticulously ascribed colors to tones and called for a color organ in his 1910 performance of *Prometheus*. One of the most famous people interested in color was Goethe, who in 1810 published *Zur Farbenlehre (Theory of Color)*. Goethe was concerned with the eye’s perception of color, insisting that we pay attention to what our senses tell us rather than theorize. His opposition to Newton’s theories was just that: they were completely theoretical and poorly constructed.\(^9\) Even while insisting people must rely on their senses, Goethe assumed that color names and effects were standard between people. He treated unusual color perception as pathology, especially when combined with

maladies such as earache or blood problems. All visual problems, he assumed, could be directly traced to eye dysfunction. Goethe stated that visual and aural sensations are related but we process them differently.

Color and sound do not admit of being directly compared together in any way, but both are referable to a higher formula, both are derivable, although each for itself, from this higher law. They are like two rivers which have their source in one and the same mountain, but subsequently pursue their way under totally different conditions in two totally different regions, so that throughout the whole course of both no two points can be compared. Both are general, elementary effects acting according to the general law of separation and tendency to union, of undulation and oscillation, yet acting thus in wholly different provinces, in different modes, on different elementary mediums, for different senses.

The “tendency to union” would happen in the brain as illuminated by cognitive theories in the twenty-first century. Goethe’s *Theory of Color* is not simply a scientific report; it includes a final section on the moral properties of each color, suggesting proper uses in light of their effects on disposition. This kind of color theory appeals to a different kind of synesthesia, a metaphorical-spiritual synesthesia, to which I will return in the following two chapters.

The first mention of a synesthetic experience within medicine comes from an 1812 dissertation by a German medical student named George Sachs. This dissertation focused upon the phenomenon of albinism which presented in both him and his sister. In a brief portion of his document, he recorded his experience of the curious coloring of letters; he called his sensation *visualized letters*. The term “synesthesia” would not appear in medical literature until nearly the twentieth century. Although Sachs was primarily occupied with the peculiarities of his own albinism, his mention of visualized letters made an impression, entering medical

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10 Goethe was one of the first to observe the pathological, abnormal perception of color. Ruprecht Matthaei, ed., *Goethe’s Color Theory* (New York: Van Nostrand Reinhold Company, 1971), 92.
12 The original title of Sachs’ dissertation is *Historiae naturalis duorum leucaetopum: Auctorvis ipsius et sororis ei us* (A Natural History of Two Albinos: The Author and His Sister). It is held in Solisbaci, Germany at the Bibliopolii Seideliani.
dictionaries in 1814 under “hallucination” and “imagination.” Sach’s writings were reviewed in 1824 by Dr. Edward Cornaz, an oculist who named the condition *hyperchromatopsia*, believing the eye caused visualization of extra colors. More of a curiosity than a scientific pursuit, synesthetic case studies rarely and only vaguely entered medical literature until the late nineteenth century. The known variants were called *colored hearing* and *colored letters*, which referred to music-color and grapheme-color synesthesia.

In the 1880s, Sir Francis Galton began to survey British populations for the prevalence of various synesthesias. The cousin of Charles Darwin, Francis Galton is considered one of the earliest researchers into synesthesia proper and is responsible for noting the consistency of individual responses and the tendency of synesthesia to run in families. He interviewed synesthetes with different forms of synesthesia, mentioning not only colored letters and colored hearing, but expanding the scope of synesthesia to include spatial number forms. Number forms are often associated with the perception of time, the calendar, the hours of the day, or even a number line. When a number-form synesthete is asked to think about a certain month or number, they perceive it in a spatial field, often a three-dimensional field, in relative position to the other months of the year or numbers on the number line. These forms may or may not involve colors.

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Explanations of a synesthete’s “visions” were so ethereal that they seemed to defy conventional wisdom of how the brain, emotions, and sensations operated. The effects were still assumed to be a problem of the eye or the portion of the brain responsible for the eye, so synesthesia’s effects were focused upon instead of its origins. Single examples of synesthesia occasionally appeared within medical studies as doctors came across synesthetic persons. While reporting on a friend of his in 1864, the French doctor Ernest Chabalier used the term *pseudochromesthésie* to express how the sensations are not real, or perhaps abnormal. In the 1890s, the term *synesthesia* finally entered the English language, originating from France in an 1892 thesis by Jules Millet on colored hearing. The word was subsequently spread in the United States by Mary Calkins, first president of the American Psychological Association.

**Artificial Synesthesia in the Mid-Nineteenth Century**

Eye problems were only one explanation for synesthesia. Another nineteenth-century supposition was that synesthetes must have used hallucinogenic drugs to achieve their
“disorder.” The kind of language derived from synesthetic connections was also widely popular in the nineteenth century through the work of authors and poets which I will discuss in the next chapter. Reflecting a double standard, the unity of the senses could be perceived as desirable if achieved by non-synesthetes through recreational use of hallucinogens, leading to hyper-awareness of reality, also known as hyperesthesia.

In the mid-1800s, hashish parties gained popularity, particularly in France, as a way for intellectuals to collectively achieve hyperesthesia of the senses. One host of such parties was a French painter, poet, and musician named Joseph Ferdinand Boissard de Boisdenier (1813-1866), who hosted “fantasias” in his Paris apartment. An anonymous participant described Boisdenier’s fantasia atmosphere in 1845:

> It is, in fact, at this period of the intoxication that is manifested a new delicacy, a superior sharpness in each of the senses: smell, sight, hearing, touch join equally in the onward march; the eyes behold the Infinite; the ear perceives almost inaudible sounds in the midst of the most tremendous tumult. It is then that the hallucinations begin; external objects take on wholly and successively most strange appearances; they are deformed and transformed. Then – the ambiguities, the misunderstandings, and the transpositions of ideas! Sounds cloak themselves with color; colors blossom into music.

These results were assumed to come from stimulation of brain areas responsible for imagination and memory, leading to insight and inspiration. Interestingly, these indulgent parties also influenced medical literature. The French poet and journalist Théophile Gautier (1811-1872) saved an invitation to one of Boisdenier’s experiment-fantasias: “Dear Théophile, next Monday the third of the ninth [1845] hashish will be taken at my place under the supervision of Moreau and Roche.” This study aided the research of Drs. Jacques-Joseph Moreau (1804-1884) and Aubert Roche (1810-1874) regarding the medical use of hashish. By evoking abnormal yet

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15 Ibid.
16 Ibid., 108.
reversible mental states, the doctors hoped to better understand mental disorder and the ability of hashish to cure them. In the same year, Dr. Moreau published a book on the merits of hashish when applied to psychological study (Du hachisch et de l’alienation mentale, *Hashish and Mental Illness*, 1845).

Gautier’s account of his hashish experience begins with a sudden urge to draw, from which he produced sketches of the visual forms that appeared as he heard live keyboard music. He then reported that he felt his body become transparent, followed later by “color avalanches” and “billions of swarming butterflies.” Along with Dr. Moreau, Gautier considered these induced states to be a kind of psychosis. Although his senses were blending, he believed this to be a result of temporary disruption in the brain and ultimately felt alienated from his own body. Due to this slightly frightening experience, Gautier looked no further than the hallucinatory nature of the perceptions and did not participate in further studies. He was also not inclined to speak of any supernatural occurrence or connection to a spiritual dimension in his analysis.

Along with Gautier, other notable members of society turned out for such fantasias, including Victor Hugo, Honoré de Balzac, Eugene Delacroix, and Alexander Dumas. I will return to discuss the artistic influence of such fantasias on the spiritually minded after a consideration of synesthesia in the twentieth century. Synesthesia would again be induced in the 1950s and 1960s with the controlled and not-so-controlled use of LSD and ketamines.

**Synesthesia in the Early Twentieth-Century**

Neurology developed into a distinct branch of science in the second half of the nineteenth century, particularly marked by the establishment in London of the National Hospital for

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18 Ibid.
19 Ibid., 109.
20 Gautier listed these names in an 1846 newspaper article. Ibid.
Nervous Diseases in 1860.\textsuperscript{21} Unfortunately, synesthesia in its known forms is all but completely absent from early neurological literature. Even today, synesthesia is still only entering the purview of neurology, and when acknowledged, appears under the caveat of abnormal perception.\textsuperscript{22} By the first half of the twentieth century, psychology had turned most of its attention to behavioral studies and translating the cause-effect behavior of animals to humans; although perception studies were still conducted, synesthesia research virtually disappeared. The strong emphasis on objectivity in behaviorism left internal thoughts and feelings - the subjective - outside the realm of measurable phenomena and valid science.

Owing to recreational drug use in the 1950s and 1960s, many who took LSD (lysergic acid diethylamide) described phenomena that sounded like synesthesia, such as the appearance of colors when a person spoke. Their accounts recalled those from the century before and several researchers were inspired to experiment anew with induced trips. In the 1960s, studies by pharmacologist Leo Hollister found that non-synesthetes on LSD reported a change in the color of an object as musical tones were played.\textsuperscript{23} Similar results were noted in the 1980s by Peter McKellar, a British neurologist; non-synesthetes described the mixing of vibrant sensations after injection with a careful amount of ketamine, an anesthetic.\textsuperscript{24} While there has been no study on whether the experiences of synesthetes change under the influences of such powerful compounds, the effects of two more common drugs have been unofficially documented. In general, alcohol slightly intensifies a synesthete’s perception and caffeine diminishes the sensory experience.\textsuperscript{25} Further research is required to pursue the effects of common substances and

\textsuperscript{21} Cytowic, \textit{Union of the Senses}, 5.
\textsuperscript{22} Ibid.
\textsuperscript{23} Van Campen, \textit{The Hidden Sense}, 111.
\textsuperscript{24} Ibid.
\textsuperscript{25} See the experiment of Richard Cytowic with a synesthete on alcohol and coffee (at separate times). His hypothesis is that the effects of drugs will depend on the areas of the brain that they affect. Cytowic, \textit{Wednesday is Indigo Blue}, 224, and Van Campen, \textit{The Hidden Sense}, 112.
environmental factors on synesthetes. In general, knowing that synesthesia-like states can be induced in non-synesthetes re-opens questions regarding the mechanics of synesthesia since it can be achieved naturally by crosswiring of the brain and a similar experience can be achieved by suppressing neurological inhibitions. Further investigation is still being conducted into the physical nature of synesthesia and synesthesia-like states.

**Developments in the Late Twentieth Century**

The neuron, after all, is a storyteller that accentuates some features, completely ignores others, and is our fragile link to the physical world.

- Richard Cytowic, *Wednesday is Indigo Blue*

Interest into synesthesia increased with the rise of cognitive studies in the 1970s and 1980s. Psychology and neuroscience began pursuing synesthesia simultaneously: psychology looked towards the brain’s role in cognition, and neuroscience towards the pinpointing of synesthetic mechanics in the brain. In this period, neuroscientist Richard Cytowic brought together acquaintances with synesthesia so he and his colleagues could conduct research based on experience and subjective reporting. Another researcher and synesthete, Sean Day, founded The Synesthesia List on the Internet in 1991. This international web forum continues to attract synesthetes from all walks of life and has led to a wealth of shared anecdotes and knowledge of synesthetic experience. Synesthesia has become a hot topic in psychology and neuroscience as scientists re-visit foundational questions regarding brain development in cognition. For many years, the brain was assumed to relegate different activities and kinds of comprehension to different areas; any kind of synesthesia was presumed to derive from “over-communication” between the specialized brain areas. Synesthesia is now causing scientists to re-investigate the
development of the brain since these abundant communications involve several areas of the brain at once.26

In his 1998 book *Bright Colors Falsely Seen*, Kevin Duran lists the following criteria for synesthesia proper. All but the second and sixth have been consistent, tested results; many synesthetes “see” their extra perceptions within the mind’s eye rather than as an external projection. In addition, many synesthetes are able to describe their color associations well.

1. Synesthesia is involuntary and insuppressible, but it cannot be invoked at will.
2. Synesthetic images are perceived by the synesthete as projected externally.
3. Synesthetic percepts are stable over an individual’s lifetime.
4. Synesthesia is memorable; that is, it aids recollection.
5. Synesthesia is almost always associated with a strong, narrow set of emotions. These emotions are generally those present in cognitive development prior to the development of language and color-naming abilities.
6. Synesthesia does not lend itself to verbal description.
7. Synesthesia occurs in people with normal, non-injured, non-diseased brains.27

Due to the abundant variety of possible sense crosswirings, there is now a plethora of known synesthesia forms that broaden the scope of synesthesia. In a 2005 survey of 572 synesthetes, Sean Day found an astonishing 38 varieties of synesthesia. This was not even a comprehensive list of all possible synesthesias and included results from persons with multiple synesthesias. The most common reported form was colored-grapheme synesthesia at 68.8 percent, followed by colored time units and colored music at 23.4 percent and 18.5 percent respectively.28 The majority of results consisted of color pairings with other sensations such as touch, temperature, and personalities. Many others recounted smells, tastes, and touches as responses to sounds, temperatures, and personalities.

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With the advent of MRI technology, we are able to watch the brain as it makes these links happen. The brain is roughly divided into areas of specialization that utilize a sort of feedback loop to unify the perceptive experience. A ventriloquist’s act is a good example of this: the eyes witness the puppet’s mouth move and the ears hear the thrown voice, but the brain combines the sensory input to make you think the puppet is talking. The advent of fMRI allows us to see the activity of brain areas based upon blood flow to neuron activity. Brain scans from 2005 show that in colored-grapheme and colored-hearing synesthetes, the visual color area known as V4 activates when words are read or music is heard. The use of fMRI has been able to demonstrate that there is some neurological basis for synesthesia because the brain is more activated when a synesthete is experiencing a stimulus. The feedback operates between the different activated areas to ultimately generate a colorful experience.

Scientists also currently search for the “synesthesia gene” or set of genes that may be responsible for synesthetic abilities and have found a potential locus on chromosomes traditionally associated with savant and autistic abilities. Besides looking for a genetic explanation of the brain’s hyper-communication, psychologists are particularly interested in the role of synesthesia in cognitive development. Where once it was thought that only the brains of synesthetes are over-connected, it is now thought instead that the human brain begins life as over-connected. Emerging evidence suggests that newborn and young infants perceive the world in a “soup” of sensory input. Light, sounds, colors, and other physical sensations abound, becoming more clearly defined as the young child learns to name each sensation. The vestiges of this learning process are still present in the mature use of language, which includes such

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29 Cytowic, Wednesday is Indigo Blue, 203.
30 From a 2005 study by Hubbard et al. Ibid., 208.
metaphors as “warm tone” and “bright smile.” Several researchers note that children seem to possess stronger synesthesia than adults, particularly colored-grapheme synesthesias, and these connections fade as the child matures.\textsuperscript{32}

In summary, research continues into the biological nature of synesthesia. Neuroscientists pursue explanations in neurons, asking if synesthetic brains are over-connected or simply uninhibited. Biologists seek the genetic definition of synesthesia and its method of inheritance. Though synesthesia is now more widely studied than ever before, a surprising deficit of practical awareness still persists within medical arenas. Counseling or psychiatric treatment is often recommended by specialists assuming the condition is pathological. However, the continuing hope is that with greater awareness, synesthesia may “come out of the closet” in professional medical fields and avenues of dialogue within the humanities. The implications of greater understanding apply to all human perception, not only that of synesthetes.

**Synesthesia, Meaning, and Creativity**

Questions of consciousness and concrete experience are raised because of the individual nature of synesthetic experience. If each synesthete experiences a different reality, what does that mean for human perception? What if all humans are synesthetic to some degree, and how does synesthesia factor into making meaning?

A considerable amount of recent synesthesia research concerns its role in “making meaning:” the definition of relationships between the self and what the self perceives. This includes the comprehension of the self’s relative position to objects, concepts, and places, as well decisions regarding how the self will interact with these things. Thus, meaning is made when a

\textsuperscript{32} Ibid.
person – synesthete or not – forms a relationship and interaction with something else. Perception helps define meanings for both synesthetes and non-synesthetes.

A classic perceptual experiment, nearly a century old, demonstrates this kind of relationship-definition in non-synesthetes. Known by the “Kiki-Bouba effect,” this experiment has been replicated with similar results each time since it was first conducted in 1929.33

![Kiki-Bouba experiment](image)

Figure 1.2: Adaptation of visual forms used in the “Kiki-Bouba” experiment

A group of non-synesthetic participants are presented with two visual forms (as in figure 1.2) and asked to choose which one represents the sound “kiki” and which one represents the sound “bouba.” Regardless of the participants’ native tongue, 98 percent chose to associate “kiki” with the spiked form and “bouba” with the rounded form.34 These results point towards an inherent link between visual and auditory contours – a semantic connection. This allows the human mind to make conceptual metaphors and to develop language that bridges sensory dimensions. Other generally agreed-upon concepts are those of light and dark, strong and weak, which we apply to the description of tastes, smells, and other stimuli. In Chapter Three, I will demonstrate how the

33 The first recording of this experiment was by W. Kohler in 1929. References to this experiment and its variations appear almost ubiquitously in synesthesia books.
34 Cytowic, *Wednesday is Indigo Blue*, 166.
composer Olivier Messiaen was particularly influenced by the semantic connotations of his synesthesia.

Richard Cytowic hypothesizes that humans have always had the capacity for forms of synesthesia. He believes that synesthetic brains are a kind of evolutionary leftover from a powerful crossmodal communication system present in the brains of primitive humans. Synesthetes as living “cognitive fossils,” as he calls them, shed light on the process of how early humans had to make sense of the world around them and relied on the extra communication of senses. However, if today’s synesthetes were supposedly like Cytowic’s early humans, we would expect synesthetes to experience a soup of experiences from all senses rather than the refined, one-to-one relationships articulated so consistently by the brain.

In 1991, Jules Davidoff published his book *Cognition through Color*, which explores how humans use color to define their worlds from infancy. Color, says Davidoff, is a significant part of object recognition but does not play a large role in affecting emotion. The object or experience to which color is attached determines the meaning that the color will then assume. He argues that though the emotional and symbolic qualities of colors may have been discussed for centuries, they are not universal due to the variance of cultural contexts. Where one interprets red as a smooth, luxuriously calming presence, another sees violent anger and still another, crucifixion or the fire of Pentecost.

Another hypothesis is that the human brain has all kinds of synesthestic connections which are only active in some people. There is hope that new knowledge of the brain’s communication patterns can lead to better rehabilitation for those who have lost processing capabilities, such as stroke victims and those suffering from other brain disorders.  

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36 Duffy, *Chartreuse Kittens*, xiii.
Synesthesia can also play a mediating role, helping us sort out the situations we like and those we prefer to avoid. Let’s say you are a colored-hearing synesthete with a great appetite for rich green chords, which happen to occur only with suspensions in A and D major. If you are a pianist, you would likely prefer performing literature that contains luxurious green moments, so perhaps your repertoire will be heavy in Brahms and later Romantic works. As a music listener, the same applies: you will likely enjoy hearing the same rich moments. Perhaps U2 will become your favorite band for that reason. When you decide to learn the guitar, A and D are the first keys in which you become proficient. Of course, without synesthesia, most people’s tastes are shaped in similar ways upon learning what sounds are pleasing and not pleasing to their ears.37 That being said, it is important to note the sensitivity to particular sounds in musicians and the role it plays in their choices.

With such renewed discussion of synesthesia and the brain, many kinds of artists have become part of the global discussion. One of the most common forms of synesthesia is colored hearing – perceiving colors and shapes when music or sounds are heard – and the conversation is rich with such participants. For example, the artist Carol Steen produces paintings to capture the essence of her visions when she hears certain noises. This process of making metaphors out of abstract connections is a staple not only for basic language use but for the artistic use of language. In his 2011 book *The Tell-Tale Brain*, V.S. Ramachandran suggests that synesthesia, particularly visual synesthesias, are linked to creative types:

Gifted writers and poets may have excess connections between word and language areas. Gifted painters and graphic artists may have excess connections between high-level visual areas. Even a single word like “Juliet” or “sun” can be thought of as the center of a semantic whirlpool, or of a rich swirl of associations. In the brain of a gifted wordsmith, excess connections would mean larger whirlpools and therefore larger regions of overlap.

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37 Davidoff also notes the central role personality plays in developing preferences. Ibid.
and a concomitantly higher propensity toward metaphor. This could explain the higher incidence of synesthesia in creative people in general. These ideas take us back full circle. Instead of saying “Synesthesia is more common among artists because they are being metaphorical,” we should say, “They are better at metaphors because they are synesthetes.”

Some synesthetes are well known, such as the novelist Vladimir Nabokov (1934-2012), who wrote extensively about his colored-grapheme synesthesia. We may understand his synesthesia not only as a contributor to his famed memory skills, but also as a fundamental guiding factor in his career as a writer. The very ways he approached letters, chose words, and strung together phrases was influenced by his color connotations to particular letters and combinations of letters. Nabokov was born to synesthetic parents and worked through the mysteries of his perception by including descriptions in his books:

… In the green group, there are alder-leaf f, the unripe apple of p, and pistachio t. Dull green, combined somehow with violet, is the best I can do for w. The yellows comprise various e’s and i’s, creamy d, bright-golden y and u, whose alphabetical value I can express only by “brassy with an olive sheen.” In the brown group, there are the rich rubbery tone of soft g, paler j, and the drab shoelace of h. Finally, among the reds, b has the tone called burnt sienna by painters, m is a fold of pink flannel, and today I have at last perfectly matched v with “Rose Quartz” in Maerz and Paul’s Dictionary of Color.

In fact, Nabokov’s masterpiece novel Ada contains references to his synesthesia as though it was an inside joke. Nabokov’s synesthetic colors of a – d – a were black, yellow, and black respectively. A yellow swallowtail butterfly is featured within Nabokov’s book, also referencing his professional-level hobby of butterfly collection. The coloration of the yellow swallowtail butterfly consists of yellow patches surrounded by black outlines.

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39 Nabokov’s parents were also synesthetes, which helped Vladimir realize that he was not the only one who saw the world differently. Cytowic, The Man who Tasted Shapes (New York: G. P. Putnam’s Sons, 1993), 119.
40 Ramachandran, The Tell-Tale Brain, 102-103.
41 For more on this kind of word-play, see Cytowic, Wednesday is Indigo Blue, 175-176.
Richard Cytowic inhabits a camp of synesthesia researchers that attributes artistic abilities to the benefits of synesthesia.

What we see in the contribution of synesthesia to creativity is similar to the universality of all archetypal sources, such as myth. The beauty of myth and symbol lies in their synthetic power. They can combine in one presentation disparate elements that would be self-contradictory if put into a declarative sentence. For synesthetic artists, and for most of their audience, I believe, there is an apperception of a connectedness and universal identity, an immediate apprehension without cognition or rational thought for touching a special truth that only metaphor can offer us. A good metaphor implies an intuitive perception of the similarity in the dissimilar. The metaphor seems to transport us closer to a world of absolute understanding that is more real than reality. The point is that we perceive something true, universal, mystic, correct in this art that is a result of the synesthetic vision.\footnote{Cytowic, \textit{Union of the Senses}, 270.}

However, this perspective is not shared by all researchers, particularly those who seek an evolutionary basis for the survival of synesthesia genes. If the trait seems to be genetically transferred, it is somehow selected. Researcher Jamie Ward prefers the view that synesthesia is common to all humans and only some possess the strongest forms. His 2008 book \textit{The Frog Who Croaked Blue} provokes thought about the nature of cognition and how humans learn about their environment. In \textit{The Frog Who Croaked Blue}, Ward refutes the claim that synesthesia enables human creativity. He takes issue with V.S. Ramachandran’s position, which is similar to that of Cytowic. Ward cites this passage from a work by Ramachandran and Hubbard:

\begin{quote}
Synesthesia causes excess communication amongst brain maps. . . Depending on where and how widely in the brain the trait was expressed, it could lead to both synesthesia and to a propensity toward linking seemingly unrelated concepts and ideas – in short, creativity. This would explain why the apparently useless synesthesia gene has survived in the population.\footnote{Ward, \textit{The Frog Who Croaked Blue}, 127.}
\end{quote}

The problem with this approach, as Ward contends, is that a measure of creativity cannot be determined by profession. Individuals channel their energies as they like, leading to different in pursuits and career choices. Synesthetes can be physicists, mathematicians, businessmen, and
skydiving instructors. Genetic promotion of synesthesia is therefore not limited to procreation among artistic types.  

Synesthesia only becomes more famous when an artistic person gains recognition by using their medium to express their synesthetic experiences. Ward argues that synesthesia can inspire art, but since there are plenty of synesthesias that have nothing to do with art, one does not beget the other. Ultimately, while Ward introduces the strong influence of synesthesia as a memory aid, he leaves open the question why does synesthesia exist? It may be an enhancing component in creativity, memory, learning processes, and abstract symbolism.

A final consideration for this introduction rests in a hypothesis found among synesthesia researchers: synesthesia is part of what makes us human. Scientists hold various positions on the nature and underlying existence of synesthesia in humans. Harry T. Hunt bases his position on synesthesia on his neurological study of consciousness and concludes that all thoughts are emergent synesthesias.  

After years of studying thought development and the senses, Hunt wrote in 1995 that a fundamental application of synesthesia is to seamlessly connect “propositional thought with semantic imagery, within a single natural series of continuously overlapping states.” Because of this, synesthesias are also integral in the cognition of symbols and the abstract. Jamie Ward says that all humans process experiences in a multisensory way. According to Ward, regular multisensory perception is not the same thing as synesthesia, but synesthesia is a further development based within multisensory processing. These abstract connections are essential to processes of logic and reasoning.

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44 Ibid.
46 Ibid.
With the formative power of synesthesia in mind, it is possible to approach known artistic synesthetes of the past with the goal of shedding new light on the importance of synesthesia in their compositional decisions and in shaping their worldview. Artists Wassily Kandinsky, Arthur Rimbaud, and Olivier Messiaen were each influenced by his own kind of synesthesia. Each felt themselves connected to another dimension that took shape in their output as well. Chapters Two and Three concern the position of synesthesia within the art of these three men.

Synesthesia is a complex area of inquiry with great promise. The biology of a super-connected brain leads to intriguing results in perception, which in turn influence the psychology and development of a mind. Many synesthetes, having become aware of their synesthesia, would not choose to live without it. Most find it a crucial component of their understanding. For example, colored-grapheme synesthetes recognize words or large numbers by their inherent pattern of colors, much like mature non-synesthetetic brains recognize complete words by total grapheme content (not necessarily in the correct order of letters). If all humans are synesthetic to some degree, what does this mean for the perception of music? It stands to reason that as we learn more about the mechanics of synesthesia, we will be able to learn more about its involvement in musician’s lives and the roles it plays in shaping more than music. In the next chapter, I will explore the variety of alternative meanings that synesthesia has assumed in artistic and spiritual contexts. I will examine how synesthetic artists have interpreted their perceptions and how the concept of synesthesia has been employed in metaphorical language and artistic production.
CHAPTER TWO
ANOTHER SYNESTHESIA: ART, METAPHOR, AND SPIRITUALITY

Colors flying around your head? Numerals with personality? All of this can seem like a wild tale or perhaps a bit of magic. There is another side to synesthesia, however, one that interprets synesthesia as the interconnectedness of language, symbol, body, and soul. This perspective has been perpetuated through aesthetic concepts for thousands of years before the psychology of literal synesthesia entered scholarly discourse. Theories of metaphysical synesthesia have been considered a source of revelation by Romantics, Symbolists, and various others seeking to balance the powers of mind and soul. An example of synesthetic theory is the Doctrine of Correspondences I will discuss later in this chapter, which entailed a mind-body-soul connection to the spiritual reality for both theologians and artists. In the late nineteenth century, science and art worked toward the same goal: how to understand the self and the universe by way of analyzing subjective experiences and emotions. Once psychology turned to behavioral and conditioning studies in the early twentieth century, art did not follow; it continued to focus on further symbolism and abstraction in quest of spiritual truths. To illustrate this “other synesthesia” - a broadly-applied synesthetic metaphor - we will turn to ancient artistic philosophies, Romantic literary seers, and the “inner truths” of an Expressionist painter.

Crossmodal Concepts in Art

Before discussing Romantic ideology, it is valuable to note the crossmodal attributes of art which preexisted for thousands of years. As I mentioned in Chapter One, Aristotle distinguished the five senses long ago. Going back even further, the language of aesthetics has served as a bridge between them. Principles of composition, color, and form borrow language
from various senses to express similar meanings. One of the oldest examples of this is the concept of rhythm within visual art. The most perfect and pleasing visual rhythms date to the Pythagoreans in the fifth century BC: the golden mean and golden ratios have since become foundational to the study of visual arts. Following Pythagoras’ conviction that the universe is mathematically ordered, Pythagoreans found simple numbers at the heart of the natural world. Strings divided by simple ratios produced consonant sonorities. Plants and animal shells grew in precise proportions. Classical Greek art carefully follows these ratios in the belief that they are evidence of a divine order since they occur in the natural world and are most pleasing to the eye. Greek artists strove for the most natural art possible and employed golden ratios in the creation of pottery, architecture, and visual compositions. Of course, this knowledge was not exclusive to the ancient Greeks. Perfectly executed artwork following the golden ratio was created by the Egyptians as early as 1330 BC. The same elements of geometry and rhythm can be found in artwork by mathematician-painters such as Piero della Francesca (1415-1492) and Albrecht Dürer (1471-1528). Historical movements of Classicism and neo-Classicism heavily emphasized the natural beauty of golden ratios, though the concept has permeated all of art history.

Color is another entity which has evolved as a signifier of divine order and truth. Medieval and renaissance color symbolism was developed along the lines of spiritual values

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1 The golden ratio is approximately 1:1.6 and is found in many naturally-occurring plant and animal growth patterns. This ratio has been used to divide visual space into pleasing compositional arrangements. Visual art employing golden ratios often places focal points and structural lines along the divisions of 1:1.6 from top to bottom, side to side, or around the circumference of a circle. As a philosophy, the golden mean has stood for the most reasonable middle point between two extremes; this concept of proportion has been found in the writings of Pythagoras, Aristotle, Confucians, and others.

2 Cytowic, *Union of the Senses*, 252.

3 See the Pectoral of Khamuasit for the son of Ramses XIX, circa 1330 BC. Cytowic, *Union of the Senses*, 250.

4 See *The Baptism of Christ* (Francesca) and *St. Jerome in His Chamber* (Dürer) as discussed in *Union of the Senses*, 250-254.
illuminated by naturally-occurring colors. For example, in Christian art red could symbolize authority or crucifixion, and blue could represent servitude or chastity. Over time, a plethora of interpretations developed - sometimes inconsistent - for particular colors. For example, in the early Middle Ages, blue was associated with darkness, but in the later Middle Ages it was a sign of goodness and light, accompanying Christ and saints in the emerging medium of stained glass.\(^5\)

The symbolic value and worth of certain colors often mirrored their economic status, such as purple, a rarer dye often reserved for royalty. Color properties are still considered and used in such fields as interior decorating. Artists have remained fascinated by color as a kind of natural order (such as R.O.Y.G.B.I.V.) that parallels cosmic order; poet Arthur Rimbaud and composer Olivier Messiaen used the mediums of word and sound to convey a similar transcendence through color.

As antiquity demonstrated, languages of rhythm and color have served as synesthetic metaphors for centuries. In the nineteenth century, Romantic writers attempted to connect heaven and earth in a parallel manner.

**Reaction to Rationalization and the Enlightenment**

In response to the Enlightenment, Western civilization began to experience what German sociologist Max Weber would call *die Entzauberung der Welt*, or “the disenchantment of the world.”\(^6\) In the early twentieth century, Weber reviewed the social and economic developments of the last several hundred years and noted that the positivism of the eighteenth century had removed wildness and mystery from the world. When everything could be subjected to reason,


\(^{6}\) Dann, *Bright Colors Falsely Seen*, vii.
and understood through persistence and application, nothing remained by which to become enchanted.

A response to disenchantment took shape in the following century. A principal nineteenth-century notion was to achieve respite from the “dead” material world in order to become “alive,” to regain the heart once lost through ages of objectivism and empiricism. In Romantic philosophy and literary arts, one often encounters belief in spiritual dimensions and connections to these other worlds. Mediation – and ultimately, a sense of bodily liberation – was sought by uniting the mind and soul. The rational mind, which had become a compelling force during the Enlightenment, had to be reined in and connected to the sensitive, subjective, and emotive soul for a person to be healthy and to attain the greatest truths. These truths were often of a sacred or supernatural nature, exceeding the limitations of reason and promoting a bond with a greater source of wisdom than humanity.⁷

Romantic thought sought to understand those who would join the objective, actual, and real world with the subjective, internal world. Regarding the use of the term “Romantic,” I will follow Kevin Dann’s description in his 1998 book *Bright Colors Falsely Seen*, which considers Romantic the sense of “aspiring to a theory of knowledge that gives primacy to the human imagination.”⁸ Dann expands on his description by referring to D. G. James’s 1963 characterization of Romanticism:

To possess a mind open to the envisagement of the strange and different, to contemplate unknown modes of being, divine and otherwise, whether God or genii, or demons or angels or a metamorphosed humanity, to refuse to be buckled down to the evidence of the senses, this is essential Romanticism, which is no mere phenomenon that appeared towards the end of the eighteenth century and died out after fifty years.⁹

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⁸ Ibid., 13.
⁹ Ibid.
Artistic pursuits lent themselves to expressing spiritual topics because of their highly symbolic potential and facilitative character. Following Dann’s historical narrative, the phenomenon of synesthesia became an allegory for achieving this mind-soul unity. Synesthetic persons were considered seers into other dimensions; synesthesia became a metaphor itself for the stimulation of all senses in artistic productions. To understand the connection between synesthesia and the arts, it is important to consider that period in the eighteenth century in which Romanticism found itself caught up in the mystery and intrigue of synesthesia. I will look at reports of synesthesia, literary metaphors emulating synesthesia, and the desirable induction of synesthesia by way of popular hallucinogens.

“Voyelles” and a Voyant

Except for George Sachs’ brief discussion of synesthesia in his 1812 dissertation, synesthesia was virtually unrecognized in Europe and if anything, was considered a rare pathology.\(^\text{10}\) It was not until the 1880s, at the time of Sir Francis Galton’s synesthesia surveys, that the possession of synesthesia could be seen in two ways: pathology on the one hand, spiritual gift on the other. It was still considered a disease, but the abilities it imparted were regarded as something special, particularly since it usually involved the “highest” senses: vision and hearing. This shift in perception was largely due to the elevation of several poets as mystical symbolists.

France was central to the development of synesthesia awareness, both in intellectual and popular circles. One particular poem is often cited as a catalyst for increased awareness. In 1883, the poet Arthur Rimbaud (1854-1891) published a series of sonnets among which was his now-famous “Voyelles” (“Vowels”). Rimbaud was already well-known for his poetry, which often

\(^{10}\text{Ibid., 17.}\)
pointed out peculiar inconsistencies in perception by using visual imagery and metaphor. His most famous work, *Illuminations*, is a collection of insightful and nearly surreal poems composed throughout the 1870s and 1880s. “Voyelles” was composed at the same time and was particularly rooted in his own perception of the alphabet, a one-color-to-one-letter colored-grapheme synesthesia:

Vowels

* One day I will tell of your latent birth:
* A, black hairy corset of shining flies
* Which buzz around cruel stench,

* Gulfs of darkness; *E*, whiteness of vapors and tents,
* Lances of proud glaciers, white kings, quivering of flowers;
* *I*, purples, spit blood, laughter of beautiful lips
* In anger or penitent drunkenness;

* U*, cycles, divine vibrations of green seas,
* Peace of pastures scattered with animals, peace of the wrinkles
* Which alchemy prints on heavy studious brows;

* *O*, supreme Clarion full of strange stridor,
* Silences crossed by words and angels:
* - *O*, the Omega, violet beam from His Eyes.¹¹

At first glance, it would seem that Rimbaud was simply describing his own synesthesia in verse. His symbolism was familiar to readers and “Voyelles” sounds like a personal set of symbols he might want to share. In fact, Rimbaud was an avid reader of medical literature and may have even been attempting to make a connection between different intellectual pursuits. The images in “Voyelles” are similar to descriptions of colored letters in French medical sources. His synesthesia is still disputed since he later admitted to inventing the vowel-colors on his own.¹²

¹¹ Dann, *Bright Colors Falsely Seen*, 22.
¹² It is unclear whether Rimbaud meant that he fabricated the entire thing, or, awakened by medical literature, he was able to put his own synesthesia into words.
Nevertheless, Rimbaud’s established presence and this poem helped propel the idea of synesthesia into the spotlight. This confluence between arts and sciences would reinforce the Romantic theme of mind-soul balance, or less subtly, the escape from objective positivism into the realms of dreams and visions. For his “seeing ability,” Rimbaud came to be known as a voyant, one who experiences inner and profound vision as would a seer.

**Correspondences: Baudelaire and Swedenborgianism**

The discourse on symbolism and synesthesia was soon augmented with the reintroduction of a work by Charles Baudelaire (1821-1867). In 1902, the poet, linguist, and art historian Victor Segalen (1878-1919) produced an interdisciplinary study on Charles Baudelaire’s “Correspondances” (1857), a poem which suggested incredible voyant abilities written several decades prior to Rimbaud’s “Voyelles.” Since “Voyelles” had become well known within intellectual circles in the 1880s, the apparent connection to Baudelaire was too large to overlook. Even though there was no conclusive evidence of their relationship, it was assumed that Baudelaire must have mentored Rimbaud because of the similarities in their work. Baudelaire must have been the original voyant, the original mystic synesthete! “Correspondances” quickly overtook “Voyelles” as a topic of conversation and became the exemplary poem of synesthesia.

**Correspondences**

Nature is a temple in which living pillars
Sometimes give voice to confused words;
Man passes there through forests of symbols
Which look at him with understanding eyes.

Like prolonged echoes mingling in the distance
In a deep and tenebrous unity,
Vast as the dark of night and as the light of day,
Perfumes, sounds, and colors correspond.
There are perfumes as cool as the flesh of children,
Sweet as oboes, green as meadows
--And others are corrupt, and rich, triumphant,

With power to expand into infinity,
Like amber and incense, musk, benzoin,
That sing the ecstasy of the soul and senses.\(^\text{13}\)

Segalen found such a synesthetic gold mine in Baudelaire’s work that he was convinced the old poet had bridged the material and spiritual worlds. Although scholars debate whether Baudelaire was a synesthete, it is known that he was a regular participant in Mr. Boisdenier’s Parisian hashish club. In fact, Baudelaire was in attendance at the very same hashish “fantasias” as his good friend the journalist Théophile Gautier, who had been unnerved by the disruption of his brain’s patterns. Baudelaire used hashish more than Gautier because he seriously believed a deeper layer of reality was made accessible. Although he believed his friend was too shy for such risk-taking, Baudelaire remained close to Gautier, even dedicating the grand work *Les Fleurs du mal* (*Flowers of Evil*, 1857) to him.

Baudelaire is often cited as an inspiration among Symbolists, whose philosophy used indirect means to communicate absolute truth. In a similar manner to Rimbaud, Baudelaire employed symbolic correspondences between sensations to evoke the meaning of something else. As Ernest Raynaud stated in one of Paris’ Symbolist newspapers:

> The Beautiful, the object of the poem, is a variety of the Unity. . . . Color, sound, smells in the last analysis amount to vibrations of matter. Change in direction of movement constitutes the form. . . . Forms express the subject by correspondence. Smells, colors, and sounds correspond. . . . All psychic or physiological phenomena have their corresponding aspect in heaven. A river corresponds to a destination; a hidden sun to a foundering glory.\(^\text{14}\)

Baudelaire believed that a single word could be the gateway to an emotion, a place, and other sensations. He was directly influenced by the doctrine of correspondences, a religious-natural

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\(^{14}\) Dann, *Bright Colors Falsely Seen*, 38.
belief that had become popular in Europe as a result of the mystical writings of Emanuel Swedenborg (1688-1772). Swedenborg had spent the earlier portion of his life pursuing knowledge in all physical sciences, mathematics, and skilled trades. He possessed great curiosity which he put to practical use; while visiting England in hopes of meeting Isaac Newton, Swedenborg studied the skills of whomever he lodged with, including engraving and lens grinding. One day, he experienced a vision of God that drove him to channel his skills into theology for the remainder of his life. His key doctrine advocated a direct link between the physical world and the truths of God. The purpose of this link, evident in the beauty of nature and the joy of man in perception, is to direct the mind to the greater Oneness that encompasses all things. The deepest knowledge can be obtained because of the “constant inflow from the spiritual world into the earthly world.”

It is contested whether Baudelaire was literally a synesthete, especially since he was a regular member of the hashish club, but his poem was named for a greater synesthesia. The synesthesia-like correspondences kept the poems by Rimbaud and Baudelaire popular; they provided evidence of a hidden sense that connects the mind to dimensions of the soul.

**Color Theorists**

In addition to the weight of words, the powerful symbolic vehicle of color was under investigation in the nineteenth century. Goethe took issue with the way scientists, particularly Isaac Newton, had objectively investigated perception as though sensory organs alone could be responsible for perception. Although Goethe nevertheless concentrated his investigations on the eye, his *Theory of Color* also dealt with the moral aspects of each color as applied in works of art. It is this part of his *Theory* that is most remembered by artists.

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Since color occupies so important a place in the series of elementary phenomena, filling as it does the limited circle assigned to it with fullest variety, we shall not be surprised to find that its effects are at all times decided and significant, and that they are immediately associated with the emotions of the mind. We shall not be surprised to find that these appearances presented singly, are specific, that in combination they may produce an harmonious, characteristic, often even an inharmonious effect on the eye, by means of which they act upon the mind; producing this impression in their most general elementary character, without relation to the nature or form of the object on whose surface they are apparent. Hence, color considered as an element of art, may be made subservient to the highest aesthetical ends.\textsuperscript{16}

Goethe lists the known effects of colors and their combinations, citing general human experience as the basis for his knowledge. His analysis considers the emotional effects of colors; although bordering on psychology, his discourse more closely resembles the seventeenth-century doctrine of Affections. For example, the purest yellow is serene and “softly exciting,” whereas a sulphuric yellow is disagreeable and sparks aversion.\textsuperscript{17}

His exploration of color properties represented a growing interest in color theory, particularly within the visual arts. Another color theorist of the nineteenth century was a chemist named Michel-Eugene Chevreul (1786-1889) who became fascinated by contrasts between colors. His rules of successive contrast, simultaneous contrast, and mixed contrast dealt with the interaction of complimentary colors and the possible visual effects. Successive contrast introduces a complimentary-colored afterimage when the eyes are moved after staring at one color for some time. Simultaneous contrast involves the interaction of two colors placed next to each other. Mixed contrast produces a new color when an afterimage is superimposed upon another color. All these forms of contrast were to play with the eye, giving the viewer a sense of motion and cuing the spirit to do the same. His work later influenced painters such as Eugene Delacroix and Robert Delaunay, as well as the movements of Orphism and Cubism. Through

\textsuperscript{17} Goethe and Eastlake, \textit{Theory of Color}, 307-308.
Delaunay, Chevreul’s chain of influence extended to Olivier Messiaen, on whom I will focus in the next chapter. Messiaen used musical colors in a similar way to Chevreul as cues to the spirit.

**Kandinsky**

In the early twentieth century, the Russian painter Wassily Kandinsky (1866-1944) began experimenting with color for its vibrations, much like Chevreul had decades earlier. Kandinsky was a colored-hearing synesthete who often listened to music and painted what he “saw.” In 1911, Kandinsky left behind all objective representation in his own artwork, developing in its place a symbolism closely tied to the behavior of music. He was a musician himself; he studied piano in Moscow and even wrote a one-act opera libretto which he called *Der Gelbe Klang* (“The Yellow Sound,” 1912). Kandinsky was also heavily influenced by Eastern religions and doctrines of Theosophy, which included the belief that the year 1900 would usher in a new era of heightened spirituality. Theosophy complimented the idea that synesthetic phenomena could not occur within the limitations of three dimensions, so there must be a fourth dimension or astral realm which ultimately enabled such visions. In 1912 Kandinsky also published his pamphlet *On the Spiritual in Art*, which treated painting as a conduit between realms. Kandinsky believed artistic creation revealed unswerving truths such as the fundamentality of ratio and shape to creating convincing, natural work. He also ascribed a spiritual dimension to color, and noted its effect upon human thought and emotion, specifically urging painters to use their talent to move viewers towards spiritual truths.

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18 Cytowic, *Union of the Senses*, 270.
19 Dann, *Bright Colors Falsely Seen*, 55. Accordingly, this new era came on the heels of the Kali Yuga, a long age of objective and matter-oriented study which ended in 1899.
Figure 2.1: Wassily Kandinsky, *Composition VII*, 1913

Regarding a painter’s responsibility toward color, Kandinsky was quite particular since he believed each color called forth a specific spiritual vibration. He understood that some people possessed synesthesia proper and were already aware of several dimensions at once. His goal was to communicate in the same way as true synesthetes, according to the basic spiritual truths of colors, to all people. Along these lines, Kandinsky cited a nearly universal tendency for cultures to associate bright colors with higher musical tones and darker colors with lower tones.\(^{20}\) Since this association had been well-documented, Kandinsky was all the more convinced of colors’ transcendent power between spirit, body, and other humans. At the same time as *The Spiritual in Art*, he began producing abstract paintings based on the premise that colors follow

\(^{20}\) Dann, *Bright Colors Falsely Seen*, 56.
such natural laws. Contrary to the harsh assessments of some critics, Kandinsky was not painting his own “disturbed” psychic state; he insisted he was appealing to the “inner element” that guided all towards spiritual truth. By creating some of the first abstract paintings, Kandinsky limited external forces so that the internal element could become more obvious.

Generally speaking, color is a power which directly influences the soul. Color is the keyboard, the eyes are the hammers, the soul is the piano with many strings. The artist is the hand which plays, touching one key or another, to cause vibrations in the soul.

It is evident therefore that color harmony must rest only on a corresponding vibration in the human soul; and this is one of the guiding principles of the inner need.

Kandinsky’s version of color-vibration painting philosophy came to be known as Expressionism, which prioritized visualizations of emotion based upon a subjective perspective. More directly than Symbolism, Expressionism evoked feelings and meanings instead of physical realities. Kandinsky strongly believed that this emotional-spiritual Expressionism was the new direction in art. When one of his paintings was rejected for exhibition, he formed the group Der blaue Reiter (The Blue Rider, 1911-1914) with like-minded artists. Together they wanted to leave behind the detached observation of Impressionism. Arnold Schoenberg (1874-1951) was another painter-musician member who challenged the emotional content of the tonal system in music.

Kandinsky’s biographers were aware of his acute color perception and many expounded the virtues of metaphorical synesthesia. The following extravagant description comes from Bettina Knapp, who in 1988 wrote of Kandinsky’s synesthesia as a kind of eidetic memory. Interestingly, she suggests that artists who wish to convey their inner visions must surrender a

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21 This element of “inner need” (innere Notwendigkeit) is usually used by Kandinsky to refer to the artist’s impulse toward spiritual expression. Sometimes he uses the phrase to refer to the actual expression itself. Wassily Kandinsky, *On the Spiritual in Art*, translated by Michael T. H. Sadler (Whitefish, MT: Kessinger Publishing, 2005), 32.
part of themselves in the process, something that does not happen in the everyday synesthetic experience (reading a book, for example).

Synesthesia may be looked upon as a giant awakening, a psychic happening, and a flaring up of forces within the unconscious. Such a process enables the artist to experience the simultaneity of sense impressions, to see the work of art coming into being, and to come into contact with new languages, forgotten species, and preformal life. So that the synesthetic experience may bear its full fruit, the artist must be willing to undergo a momentary eclipse of his conscious personality and a dissociation of the ego, allowing him to be engulfed by the powers of the collective unconscious. Then the inner eye and ear can feel cadences and aromas, as well as the material fullness and aerated atomizations of sublimated spheres.24

While this description is rather flowery, Knapp points at the kind of deep need that some artists feel to recreate their visual revelations. Of course, synesthetes remains in control of their decisions and their sensory input does not involve a loss of self, but from Knapp’s description, we do get a sense of the awe-inspiring power that synesthesia can have on the mind of a synesthete. Some synesthetes, like the novelist Vladimir Nabokov, sort out their images and impressions in words, others like Kandinsky through paintings in which color is form. Olivier Messiaen, a French musician and devout Catholic, was also a colored hearing synesthete.

Messiaen belonged to the generation following Der blaue Reiter and scorned the concept of absolute atonality. He believed that “there aren’t any modal composers, tonal composers, or serial composers. There is only music that is colored and music that isn’t.”25 Color and faith had the greatest degree of influence on his musical production. In his compositions, Messiaen was neither Impressionist nor Expressionist; he cast off restrictions of time and harmony to surpass symbol and place humans completely within spiritual moments. The influences of color theory and correspondence ideals place Messiaen within Romantic aesthetics. In the following chapter, I

24 Dann, Bright Colors Falsely Seen, 60.
will demonstrate how Messiaen’s synesthesia strengthened his musical portrayal of spiritual moments and also defined his reality, thanks to his willingness to discuss his real-time body-soul correspondence.
CHAPTER THREE

OLIVIER MESSIAEN

Messiaen’s Background

Olivier Messiaen is well known for his emphasis on the importance of color in musical compositions. It may not come as a surprise that Messiaen was a colored-hearing synesthete; his colors were not confined to traditional harmonic structures and he even designed his own pitch modes to encapsulate these colors. He considered Debussy a master painter of colors and frequently drew upon his predecessor’s music for instructive purposes. A set of interviews with Claude Samuel centered so strongly on Messiaen’s colors that Samuel named it *Music and Color*, and Messiaen’s seminal treatise concerned color as a central aspect of composition (*Traité de rythme, de couleur, et d'ornithologie*, 1992-94). Several of his scores, such as that of *Couleurs de la cité celeste* (1963) contain his explanations for the colors pertaining to particular harmonies. Not only were his compositional choices directly influenced by his color perception, they served his Catholic theology, which embraced knowledge of early Christian writings and color symbolism. Messiaen’s synesthesia mingled with his sensitivity to nature, drama, and theology to generate his appetite for sonic grandeur.

Olivier Messiaen was born in 1908 to Pierre and Cécile Messiaen in the French province of Avignon. Olivier’s mother Cécile (née Sauvage) was a well-known poetess to whom the composer credited the formation of his connection with the supernatural. While pregnant with her firstborn, Olivier, she composed a book of poems titled *L’Ame en bourgeon* (*The Soul in Bud*, 1908). Cécile reveled in the wonder of new motherhood and filled her poetry with mysterious, beautiful phrases and nature-related allegories. *L’Ame en bourgeon* was dedicated to the unborn Messiaen, who considered the book a prophetic influence on the rest of his life.
According to him, his mother’s mention of birdsong, music, and the Orient were too fortuitous to be coincidental.

XIV. Je savais que ce serait toi... (I knew it would be you...)

I knew it would be you!
With you little mouth,
This forehead and this voice,
The uncertain, searching gaze.

... How ever could I not have seen you
With my mind’s inward eye?
Nothing of you was unforeseen,
Little soul, which I have made.¹

In an earlier poem from L’Ame en bourgeon, Cécile marvels at the child she will soon welcome into the world. “La tête” (“The Head”), contains the kind of colorful picture, complete with birds, that Messiaen would say shaped his future before he was even born.

IV. La tête (The Head)

O my son! I’ll hold your head between my hands
And say: I’ve shaped this little human world;
Beneath this tiny forehead, a narrow dawn of light,
I’ve placed the new-made universe which shines serene
And washes grey rain-sorrow in pure pale blue.
I’ll say: I’ve put the spark into those eyes,
I’ve taken from the moon’s so-secret smile,
The sea-reflections, and the plum’s soft bloom
These two clear stars, which look upon infinity.
I’ll say: I’ve formed this cheek, this little nest – the mouth
From which the voice, a tiny bird, struggles forth;
This is my work, this world, a human face.²

Messiaen internalized these poems, saying that his mother watched over him as a guardian angel.³ Her “inner vision,” as he liked to call it, formed the basis of his sensitivity to sounds, color, and imagery. According to Messiaen, Cécile was not only able to comprehend the beauty

² Stanza 1. Ibid., 203.
of natural events, she was able to surround even allusions to death with a “halo of light” that transcended the finality of tragedy.\footnote{Dingle and Simeone, \textit{Olivier Messiaen: Literature, Art, and Music}, 257.} Although he did not speak of himself as a \textit{voyant} or a person of inner vision, his ability to speak openly of the most profound things would later be expressed in his own musical language.\footnote{Ibid., 259.} He set only one of his mother’s texts to music before declaring he would not continue, considering his mother’s poetry too precious to convert into song.\footnote{Peter Hill and Nigel Simeone, \textit{Messiaen} (New Haven, CT: Yale University Press, 2005), 21.}

Messiaen also became enchanted with the natural world at a young age. While his father served abroad in World War I, Olivier Messiaen and his family moved to the mountain town of Grenoble and lived there for five years. As an adult, he would return to this region at the foot of the Alps to compose music inspired by the magnificent landscape. Messiaen also began noting birdsong at the age of fourteen or fifteen while spending summer holidays with his aunts in the countryside of the Aube in Fuligny. Young Olivier’s fascination with music, drama, and color revealed itself early as well. When he was seven years old, he received Gluck’s \textit{Orphée} as a gift and was so impressed that he began requesting more scores for holiday gifts. He made a habit of playing through them and singing along at the piano, a practice he would continue for the rest of his life.\footnote{Ibid., 13. Even in his seventies, Messiaen would record himself singing parts of his own opera while Yvonne Loriod-Messiaen played the piano part. This was intended to serve as a model for the actual singers to follow.} His mother and father also ensured the sufficient quality and quantity of literature in their home, leading to Messiaen’s familiarity with Shakespeare, Keats, and other writers. Young Olivier would put on small performances of plays for his younger brother Alain in a toy theater he had outfitted with homemade lighting. Olivier spent hours carefully crafting his lighting fixtures with tinted cellophane from food containers. This aspect of his performances was
particularly important to him, and he would take great pains to ensure that the lighting and colors had the appropriate effect within the intended scene.  

In Cécile Messiaen’s letters, she mentions that young Olivier already possessed a strong faith and had learned his catechism by the age of ten. Olivier himself remembers no particular moment of conversion, only that he undeniably knew the truth of God’s existence and the Catholic faith. Throughout his entire life, Messiaen’s musical output drew from this deep well of sureness in divine grace and joy. During World War II, Messiaen served as a medic in the French military. In the course of his service, he was captured and held in a Silesian prisoner-of-war camp, during which time he composed one of his most well-known works: the apocalyptic and redemptive-themed Quatour pour le Fin du Temps. After his release in 1941, Messiaen returned to Paris with an appointment to the faculty of the Paris Conservatoire, where he taught for many years, mentoring such pupils as Pierre Boulez, Karlheinz Stockhausen, and William Bolcom.

**Messiaen and Color**

Messiaen saw colors and textures in states of motion when he heard music, and vice versa: he could notate colors with musical gestures as well. He was not shy of discussing his colors and emphasized their importance to the creation of good music. The following two excerpts demonstrate the nature of Messiaen’s synesthesia and its useful character.

> It’s extraordinary that, not having the blessed malady of my painter friend [Blanc-Gatti], I am all the same affected by a sort of synesthesia, more in my mind than in my body, that allows me, when I hear music and also when I read it, to see inwardly, in my mind’s eye, colors that move with the music; and I vividly sense these colors, and sometimes

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10 Ibid. See also: Messiaen and Samuel, *Music and Color*, 17.
I’ve precisely indicated their correspondence in my scores. Obviously one should be able to prove this relationship scientifically, but I cannot.\textsuperscript{11}

When I hear music – and it was already like that when I was a child – I see colors. Chords are expressed in terms of colors for me – for example, a yellowish orange with a reddish tinge. I’m convinced that one can convey this to the listening public. This correspondence, this interrelation of sounds, colors, scents, has already been captured by Baudelaire in the poem “Correspondances.” This expressive possibility helps me to say things which can’t normally be said, not in words and not in music, pure and simple, either. . . . I’m like the first Christians who’d invented a secret written language which could be read from top to bottom and the other way around, from right to left and the other way around, from all sides and in every direction, and which always produced a cross-shape with alpha and omega. . . .\textsuperscript{12}

Messiaen was well acquainted with visual art, and likened his artistic approach to color to that of Robert Delaunay (1885-1941) and Charles Blanc-Gatti (1890-1966). Delaunay was a French painter who treated color as the focus and substance of his work. Following color theorists of the previous century such as Goethe and Chevreul, Delaunay experimented with complimentary colors, those which directly oppose each other on the standard color wheel. He felt that the patterns of wavelength vibrations between complimentary colors, often synchronous due to their proportions, were evidence of a universal harmony.\textsuperscript{13} Beginning in about 1911-1912, he strove for this ultimate purity of contrast in his compositions. Beyond experimentation with complimentary colors, he would sometimes play on the dissonance of colors; that is, the introduction of colors that tended to clash since they are not perfectly complimentary.

\textsuperscript{11} Messiaen and Samuel, \textit{Music and Color}, 40.
\textsuperscript{12} Almut Rossler, \textit{Contributions to the Spiritual World of Olivier Messiaen}, translated by Barbara Dagg and Nancy Poland (Duisburg, Germany: Gilles & Francke, 1986), 54-55. Originally from the Second Dusseldorf Messiaen Festival.
Charles Blanc-Gatti was Messiaen’s contemporary and another of the composer’s favorite painters. Blanc-Gatti experienced a strong form of colored-hearing synesthesia. Due to this, he was aware of the emotional attributes of colors and utilized them to play on both physiology and psychology. Messiaen admired how Blanc-Gatti used colors to create a kind of visual music that elicited emotional and physical responses.\textsuperscript{14} Messiaen’s opera, \textit{Saint François d’Assise}, is rife with moments of color contrasts and color compliments. This can be somewhat attributed to his familiarity with color theory through his favorite artists, although Messiaen did not discuss color theory at length. His musical-visual synesthesia allowed him to paint with

\textsuperscript{14} Benitez, “Pitch Organization,” 161.
sound. He combined his knowledge of color theory, symbolism, and his own synesthetic responses to achieve powerful moments in his music. He acknowledged color as the primary compositional guiding force since it ultimately had the power to dazzle human beings.¹⁵

Messiaen was also particularly enchanted by stained-glass windows, another form of powerful color- and light-based imagery which he had experienced from an early age. He often referred to the first stained-glass windows he saw: those of La Sainte Chapelle in Paris. To Messiaen, the ancient art of stained glass was the perfect fusion of man-made and natural forms which produced a dazzling image under the influence of light. He likened the vibrations of light and sound to the vibrations of the soul, saying “all sacred art is first a rainbow of sounds and colors.”¹⁶ Messiaen came to use the French term éblouissement (“bedazzlement”) as a result of his encounter with stained-glass windows, and later, as a metaphor for encounters with the divine. Music would provide the kind of imagery with which Messiaen sought to dazzle audiences as he was himself dazzled. The vast majority of his works evoke joy, grace, light, and revelations; he would say that he did not bother with “dirty” confrontations with man’s sinfulness since the central messages of Christianity are so full of hope.¹⁷

Near the end of his life, Messiaen set to work on a lengthy treatise. Traité de rythme, de couleur, et d'ornithologie (1949-1994) would eventually occupy seven volumes with Messiaen’s

¹⁵ “It is also true that I put colored music above liturgical music and religious music: liturgical music celebrates God in His dwelling-place, in His Church, in His own Sacrifice; religious music discovers at every hour and everywhere, on our planet Earth, in our mountains, in our oceans, among the birds, the flowers, the trees, and also in the visible universe of starts which circle around us; but colored music does that which the stained-glass windows and rose-windows of the Middle Ages did: they give us dazzlement.” From Rossler, Contributions, 65. Translated from the Conference de Notre Dame, 1977.  
¹⁷ “Some people have told me, ‘There's no sin in your work.’ But I myself feel sin isn't interesting, dirt isn't interesting. I prefer flowers.” Messiaen and Samuel, Music and Color, 213.  
Also: “I only express joy and glory in my music. . . . But it isn’t my nature to bury myself in suffering. . . . On the one hand, there are people whose view of the next world is obstructed by the suffering on earth; there is Job, who is driven by his suffering to reproach God. On the other hand, there are those who, despite suffering, constantly assert afresh their hope of everlasting life.” Rossler, Contributions, 52-53.
compositional theories on rhythm, color, and birdsong. The final volume is entirely devoted to Messiaen’s colors and includes notations of all his modes, chords, and pitch collections labeled with their particular colors. Although Messiaen preferred to think of music as only color (not based on tonal, modal, or serial organization), his purest colors come from chords and keys based upon tonality.\textsuperscript{18} For example, the key of E-flat major would appear reddish and the key of F major would appear green.

When Messiaen speaks of his six modes of limited transposition, his color descriptions become more complex. For example, the first position of the second mode consists of a dominant violet-blue and “blue-violet rocks, dotted with gray cubes, cobalt blue, Prussian blue, dark, with hints of purplish violet, gold, ruby red, and purple stars, black, and white.”\textsuperscript{19} The first transposition of the second mode contains various green chords when harmonized within the mode (see figure 3.2). Each mode follows a particular pattern of intervals that repeats after a number of permutations, thus ending on the same note or chord and limiting possible transpositions. The whole-tone scale is an example of such a mode, though it is not original to Messiaen. All of his modes possess their own color characteristics. Each transposition changes the character and the movement of the colors.

\textsuperscript{18} Messiaen and Samuel, \textit{Music and Color}, 63.

Several scholars have analyzed the features of Messiaen’s keys, chords, and modes for consistency and underlying meaning. These investigations seek to better understand Messiaen’s intended imagery and compositional choices. In 1986, Jonathan Bernard undertook an analysis of Messiaen’s chords based on pitch content. He noted that at that time synesthesia research was dwindling, perhaps due to a lack of universal conclusions. He sought the meaning of Messiaen’s color associations within quantifiable characteristics of particular sonorities. Bernard’s search yielded unsatisfactory results since he first grouped sonorities by color commonalities, then attempted to relate chords and modes while downplaying the role of tonality. Unfortunately, since synesthesia’s consistency for Messiaen is not found in interval measurements but rather according to particular notes and keys, Bernard’s study is slightly misleading. He assumes too many connections between unrelated chords and modes in his search to understand Messiaen’s synesthesia. In his search for Messiaen’s color meanings, Bernard also

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leaves out mention of symbolism. One cannot discuss Messiaen’s colors, however involuntary and consistent, without the inseparable dimensions of theology and devotion.

In order to determine the best meaning-color relationships from Messiaen’s music, it is better to begin with pitches exactly as he does in his Traité since his synesthetic cues are tied to them. In his 2001 dissertation, Vincent Benitez approaches Messiaen’s colors by pitch collection, also taking issue with Bernard’s study for focusing on modal use and eschewing pitch content. Furthermore, Benitez stresses that Messiaen’s color in compositions, particularly Saint François, are often based on sonorities outside of his beloved modes. This is done by examining Messiaen’s treatises, his score markings, and his own words from interviews. Benitez emphasizes the role of symbolism in Messiaen’s color meanings, noting that the composer’s devotion to the Catholic faith was the largest guiding force behind his use of color in composition.

Both Bernard and Benitez contribute to the discussion regarding the importance of Messiaen’s synesthesia: the involuntary perception of color, combined with the symbolism of colors, is how to best understand Messiaen’s music. However, we must also recognize that because of his synesthesia, the line between Messiaen’s symbolism and reality was somewhat blurred.

**Messiaen’s Colors in Music... and Computers**

By way of introduction, I will discuss one of Messiaen’s colorful pieces which has also been revisited in recent musical-psychological research. In 1963, Messiaen published an instrumental work titled *Couleurs de la cité celeste* (Colors of the Celestial City) based upon the precious gems of which the New Jerusalem is made in John’s Revelation. In the composer’s own

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22 Ibid.
words, the form of the work takes shape from the interplay of these hues with other favorites of Messiaen’s motivic materials.

The form of this work depends entirely on colors. The melodic and rhythmic themes, the complexes of sounds and timbres, evolve in the same way as the colors. Within their perpetually renewing variations, one can find (by analogy) colors cold and warm, complimentary colors that influence their neighbors, color gradations moving towards white and others receding into black. These transformations can also be compared to characters acting within superimposed scenes, simultaneously developing several different stories.

Alleluias of plainchant, Hindu and Grecian rhythms, permutations of duration, birdsongs of different countries: all these accumulated materials serve color and the combination of sounds which create and name it.\(^{23}\)

The colors to which Messiaen refers are the same as those John uses to describe the construction of Jerusalem from precious materials. Topaz, sapphires, and chrysolite are among those mentioned in the passage from the fourth chapter of Revelation. To create the effect of these colors, obvious only to Messiaen himself, he chose modes and chords that most closely matched those gems in color. Within the score, he added notes to let the performers know what color they were playing at that moment. Messiaen also noted the names of rhythms he borrowed from Hindu and Greek traditions as well as the particular bird calls that heralded special moments.

In 2010, *Couleurs de la cité céleste* was used in a synesthesia-modeling study to demonstrate that Messiaen’s colors were consistent with particular chords regardless of voicing.

\(^{23}\) La forme de cette œuvre dépend entièrement des couleurs. Les thèmes mélodiques ou rythmiques, les complexes de sons et de timbres, évoluent à la façon des couleurs. Dans leurs variations perpétuellement renouvelées, on peut trouver (par analogie) des couleur degrés vers le blanc, rabattues par le noir. On peut encore comparer ces transformations à des personnages agissant sur plusieurs scènes superposées et déroulant simultanément plusieurs histoires différentes.

Alleluias de plain-chant, rythmes hindous et grecs, permutations de durées, chants d’oiseaux de différents pays: tous ces matériaux accumulés sont mis au service de la couleur et des combinaisons de sons qui la supposent et l’appellent.

From a note by the composer in *Couleurs de la cité céleste* (Paris: Leduc, 1966).
or instrumentation. Based on Messiaen’s descriptions of sound colors and movement, music professor Paul Dworak used modeling software to compute where Messiaen’s colors fell within a three-dimensional field of vision. This exercise in perception also allows us to see how Messiaen’s experience of music was more than a flat experience within the mind (i.e. like a two-dimensional movie playing on a screen) and could involve the proximity of colors. His experience is corroborated by that of current synesthetes; many possess three-dimensional colored hearing in which colored forms approach and recede in addition to their up-down and side-to-side movement.

Due to the individuality of synesthesia, however, no one person will be able to see Messiaen’s colors exactly as he did. If anything, a synesthete will experience a completely different – and perhaps discordant – color presentation when they hear Couleurs. Messiaen’s intention for the score markings was not really for the listener to track during a performance, but rather as an interpretive aid for the conductor. A performer, on the other hand, may be intrigued by the addition of such markings, allowing for ease in navigating the piece or as an understanding of Messiaen’s inspiration. This piece is useful for demonstrating the kind of color-painting and symbolism that Messiaen so often worked into his music, but it does not shed much light on the meaning he read into color, nor does it illuminate his spiritual connection to colors.

Fortunately, we can better understand Messiaen’s concept of reality through a different musical work that actually incorporates human characters. In his 1983 opera Saint François d’Assise, he not only used his compositional tools to create otherworldly effects, he actually references the role of color in his worldview by involving humanity connected with the spiritual realm. Because

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25 Cytowic, Wednesday is Indigo Blue, 174.
of this connection, the titular figure of St. Francis gets to experience a moment of dazzling color-truth that nearly leaves him dead.

**The Genesis of St. François**

Messiaen never planned to write an opera. In fact, he considered himself lacking the talent for it. In spite of this, Rolf Liebermann, director of the Paris Opera, persistently requested such a work from him. Messiaen was finally cornered when, in the presence of the French president, Liebermann good-naturedly blurted “Messiaen, you will write an opera!” In such circumstances Messiaen felt he could not refuse, and set to work on what would become his largest musical creation. He would have chosen the life of Christ as the subject of his opera, but he felt such a divine and violent story was unsuitable for the operatic stage. Messiaen selected instead a person whose post-conversion life closely resembled the humility and grace of Christ: St. Francis of Assisi.

Initially proposing a completion time of four years, Messiaen would eventually take eight to finish this five-hour opus for large orchestra, three ondes Martenot, and a chorus of 150. He gave particular directions for the placement of musicians and for the exact lighting of sets, specifying directions, angles, and colors in order to cast particular moods. A large screen was placed behind the stages onto which diorama-like scenes were projected. The size of this opera proved to be a considerable strain on Messiaen’s physical and mental health. The process of orchestration required him to stand over oversized sheets of manuscript paper for hours. He had already requested one deadline extension when he reached an emotional crisis near the end of 1981, doubting he would ever finish the opera. Throughout 1982, he continued to work on the

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28 Ibid., 333.
orchestration with his wife Yvonne Loriod-Messiaen and the premiere of *Saint François* occurred on November 28, 1983.

The opera is constructed of three acts with eight tableaux. The tableaux consist of life-events of St. Francis, punctuated by three appearances of an Angel: once at the leprosy hospital, once to perform the music of God, and finally as Francis is ushered into glory at his death.

**Act I**

Tableaux 1: The Cross.
Saint Francis seeks perfect joy which can only be achieved through enduring suffering. He converses with Brother Leo on this subject.

Tableaux 2: Lauds.
The Brothers recite Matins. Afterward, Saint Francis prays he might meet and love a leper.

Tableaux 3: The Kissing of the Leper.
Saint Francis enters a leprosy hospital, beginning a conversation with an angry leper during which the Angel appears. The Angel convicts the leper of his misplaced passions and reveals to him the goodness of Saint Francis. The leper repents and as Saint Francis embraces him, he is healed. Saint Francis exults at the grace growing within himself.

**Act II**

Tableaux 4: The Journeying Angel.
The Angel, disguised as a poor traveler, knocks loudly on the monastery door. Brother Elias answers, and having no patience for the great noise or the Angel’s subsequent theological questions, does not reply and drives the Angel away. The Angel knocks a second time and is answered by Brother Bernardo, who wisely replies. The Angel departs and the Brothers Bernard and Masseo realize they had encountered an angel.

Tableaux 5: The Angel-Musician.
The Angel appears again to Saint Francis. He plays a solo on the viol to give Francis a taste of divine Truth. Saint Francis is overwhelmed by the beauty of the music that he faints.

Tableaux 6: The Sermon to the Birds.
Francis goes to Assisi, followed by Brother Masseo, and preaches a sermon to birds assembled in a giant oak tree. All the birds represent various countries and sing and reply to his sermon.
Act III

Tableaux 7: The Stigmata.
Saint Francis travels alone to a cave near the monastery. A vision of a cross appears to him, accompanied by the voice of Christ. Five beams of light burst from the cross, with the sound previously heard from the Angel’s knocking, striking Francis where the wounds of Christ occurred and substantiating the saint’s holiness.

Tableaux 8: The Death and New Life of Saint Francis.
Lying on the ground, Saint Francis bids farewell to his Brothers, the birds, and all around him. The Angel and the leper, now dead, appear to him. At his moment of death, all disappears, but slowly with a heavenly chorus, a spot of light spreads from the location of his body and reaches blinding whiteness as the curtain falls. Messiaen deliberately avoided inclusion of the saint’s earlier interpersonal struggles, such as Francis’ Oedipal disagreements with his father, the lavish lifestyle he lived before conversion, and his journey on the Crusades. The composer wished to focus on the Christ-seeking qualities in the character of St. Francis; even by eliminating much historical material, Messiaen had enough substance to exceed five hours of stage time.

Messiaen drew much of his material for this opera from writings by St. Thomas Aquinas and writings about St. Francis. Three works in particular formed the basis of Saint François: Aquinas’ Summa theologica, Francis’ Canticle of Brother Sun, and the Fioretti, a fourteenth-century collection of anecdotes from St. Francis’ life. At age 16, Messiaen had become familiar with the Summa theologica, an accessible mid-thirteenth-century theology manual best known for its five arguments for the existence of God. Messiaen had already incorporated direct quotations and paraphrases from the Summa into La Transfiguration de Notre Seigneur Jésus-Christ (1965-1969) and Méditations sur la mystère de la Sainte Trinité (1969). Other works of his, such as Les Corps glorieux (1965), also contained references to the writings of Aquinas. Several passages of the Summa would become the foundation for key events in the fifth and

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30 These descriptions combine Messiaen’s descriptions in the score, liner notes to Saint François d’Assise by the Schoenberg Choir (1999), and notes from various sources.
31 Messiaen and Samuel, Music and Color, 212-213.
eighth tableaux 5 of Messiaen’s opera. After the completion of *Saint François*, Messiaen discussed in greater detail the underpinning of Thomistic texts in the opera, particularly concerning the expression of truth by way of symbol.\(^{32}\)

In the *Summa*, Aquinas directly addresses the role of music as both worship and expression. He asks several questions regarding the function of music in a Christian’s life, one of which brings us closer to understanding Messiaen’s inspiration: is music capable of leading humans to God? Aquinas concludes that music, if composed according to divinely-established principles of harmony, proportion, and consonance, can lead to aesthetic pleasure but not necessarily to the spiritual pleasure from which it originates.\(^{33}\) Thus, music can only be a secondary pursuit to the study of God’s word and meditation. Siglind Bruhn explored Aquinas’ writings on consonance, noting that since God ordered all things, as things behave according to their natural order, they are endowed with consonance. According to Aquinas, the holy Trinity is the most perfect of united consonances, or “per consonantiam unum.” Bruhn concludes that “in this broadest sense of *con-sonare*, Thomas can thus be said to regard the Triune God and all Creation under a musical analogy according to which, at the highest level, all variety is gathered together in perfect unity of sound.”\(^{34}\) Following this logic, music can definitely lead humans to God. If the organization and pleasant properties of music are the same as those that order both Creator and creation, then it can reveal truths of a higher order.

How can music reveal the divine? Aquinas and Messiaen both believed that music itself is symbolic, and Messiaen would use music to reveal such truth of a higher order. In a sort of correspondence, similar to that expressed by Swedenborgians, music can demonstrate for


\(^{33}\) Bruhn, *Holiness and Trinity*, 16.

\(^{34}\) Ibid.
humans the beauty and order of God and heaven simply by sound. For Messiaen, of course, this sound was synonymous with color, another wordless and powerful form of communication. The basis of premise and function for Messiaen’s opera begins with this particular passage of Aquinas’ Summa:

> Just as human reason fails to grasp poetical expressions on account of their being lacking in truth, so does it fail to grasp Divine things perfectly, on account of the sublimity of the truth they contain: and therefore in both cases there is need of signs by means of sensible figures.35

Aquinas denied the objection that poetic devices lacked truth and were insufficient to express the sacred. By extension, music can be included in the definition of poetic science.

> I say that the poetic science concerns things that cannot be grasped by reason because of a shortage of truth; hence the reason must be seduced by certain likenesses; theology, however, is about things that are above our reason; and so the symbolic mode is common to both, since neither is proportioned to our reason.36

Messiaen was like-minded and applied the symbolic mode to music, ultimately concentrating on the kind of dazzlement (éblouissement) that already fascinated him in stained-glass windows. He remarked that “music is the art form closest to the expression of faith . . . It is capable of explaining things, something that so far even mystics and theologians have not been able to do.”37

Messiaen set about explaining things with his opera. Saint François became thickly layered with modes, timbres, birdsong, color, rhythms of added value, palindromic rhythms, modes of limited transposition, revolving chords, and various pieces of his musical language. Every component was a symbol. Each character was assigned a particular birdcall that accompanied their stage entrance. For example, the Angel was preceded by the call of the

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36 Bruhn, Holiness and Trinity, 33.
37 From a conversation Messiaen had with Leonardo Pinzauti. Ibid, 34.
gerygone, a small bird of New Guinea whose name means “born of sound.” The melodies of birdcalls were augmented and harmonized in various portions of the score (e.g. The Sermon to the Birds and the forest’s response to the Angel’s solo) to demonstrate the force of nature. Messiaen pushed boundaries of timbre with unusual combinations of sound to create vivid audio effects. To this end, he called for a tuba player to use a bassoon reed to create an “awful squawking” birdcall (see figure 3.3), for the three ondes Martenot to trade measures during the Angel’s mysterious solo, and for the low strings to sometimes bow with a triangle rod. Certain characters only communicate in certain ways, like Brothers Sylvestre and Rufin, who only speak in psalmodies. Everything is a symbol and an example of Messiaen’s creativity in action.

![Figure 3.3: Directions to the contra-bass tubist for playing a falcon call in Tableaux 5 of Saint François d’Assise (Paris: Leduc, 1992).](image)

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39 Hill and Simeone, Messiaen, 324-325. Also note the original markings in the score: Olivier Messiaen, Saint François d’Assise: Tableaux V (Paris: Leduc, 1983).
Saint François and Organic Éblouissement

*Saint François* is comprised of all Messiaen’s musical techniques, but perhaps the most striking is that which he dubs *éblouissement*. This literal “bedazzlement,” or the overwhelming of the senses, appears in the fifth tableaux. Messiaen considered the fifth tableaux the central scene of the opera, in which the Angel appears to St. Francis for the second time. Prior to this, Francis has sung a request for some glimpse of heaven. The Angel appears to Francis, utters the following words, and prepares to play heavenly music on a viol:

> God dazzles us through excess of Truth. Music carries us to God in default of Truth. You speak to God in music: He will answer you in music. Know the joy of the Blessed by the sweetness of color and melody. And may the secrets of glory open for you! Hear this music, which suspends life from the ladders of heaven, hear the music of the invisible.\(^{40}\)

The angel begins to play the viol, first slowly and delicately, then with great passion, and the entire forest resounds and responds. St. Francis is enraptured and overwhelmed; by the end of the Angel’s solo, he has fainted. Brothers Masseo and Bernard come across him shortly afterward and St. Francis has only enough facility to comment on the beauty of the music as he slowly revives.

Messiaen was knowledgeable of legends surrounding St. Francis and referred to one particular anecdote in this scene. Francis had become a skilled viol player early in life and retained a lifelong love for the instrument. One day, he went into a trancelike state, enraptured by the beauty of ecstatic heavenly music. He picked up two sticks, holding one as a bow and positioning the other as a viol, and began to play feverishly, in delight at some unheard music.\(^ {41}\)

The Angel’s viol solo in the fifth tableaux recalls this moment of utter beauty touching the saint’s heart.

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\(^{40}\) Bruhn, *Holiness and Trinity*, 32.

\(^{41}\) In the 2009 Opus Arte production of *Saint François* by the Hague Opera, the Angel’s bow and viol consist of two lengthy fiberglass poles, a response perhaps to this very tale.
Perhaps the music in this scene, upon first hearing, does not resemble what our imagination conceives of as celestial music. How then are we supposed to understand the divine-music-order connection by virtue of hearing alone? Interestingly, in a series of interviews with his student Claude Samuel, Messiaen advised audiences to simply assume this connection exists and undergirds his works. He acknowledged that most listeners would be completely unable to follow along with a score, let alone identify his colors and birdsongs without extensive markings, so it would ultimately be too distracting to try. Messiaen suggests that the emotions and beauty should be evident in the music and calls the listener simply to assume several givens:

CS: What rules must be observed in order to “listen properly?”

OM: First, to arrive at the concert with an open mind, with no animosity toward the composer; then, to love nature, knowing how to appreciate it in all its manifestations, sounds as well as colors, colors as well as perfumes; and perhaps also to maintain a reflection on musical order, to allow yourself to realize that in this apparent disorder, a hidden order reigns, that in this lack of harmonic control, chordal colors are implied, and that in this lack of rhythm, thousands of superimposed rhythms blend into one great rhythm in blocks of duration.42

Right before and during the Angel’s viol solo, the choir hums a C Major triad accompanied by muted strings on the same harmonies (see figure 3.4). The chord and key of C Major was white to Messiaen, and combined with the Christian symbolism of absolute purity, he selected C Major harmonies to create exactly that impression. Though Messiaen frequently referred to his modes, he still held tonality in high regard since it follows natural laws.43 In his *Traité de rythme, de couleur, et d'ornithologie*, Messiaen describes the companion qualities of transfiguration and the consummation of all other colors present within white.44 In addition to its symbolism, the moment of clear C Major harmony feels set apart from the other substance of the

42 Ibid., 133.
43 When asked to compare tonality with serialism, Messiaen says tonality exists because it is guided by natural resonance. Serialism was only invented by a human mind and will therefore not endure as tonality has. Ibid., 51-52.
opera which consists of tonality-defying melodies and textures. Once the simple, pure background is created, the Angel plays a haunting melody within the overtone series, echoed between the three ondes Martenot in their various locations. When the Angel plays more passionately and the forest resounds, we return to birdsong harmonized modally, as well as further birdsong in rhythmic variations in instruments with lower timbres. But for that moment, and again following the forest’s response, the Angel’s playing directly consists of the purest beauty Messiaen could imagine. This effect is heightened by Messiaen’s technical directions to place a white spotlight on the Angel, which gradually shrinks and concentrates until only the right arm, bow, viol, and left hand of the Angel remain visible.45

This moment of heavenly vision is particularly striking when we consider that the materials of its composition are analogous to Messiaen’s reality. In a 1997 article for *Perspectives of New Music*, Christian Asplund compares the methods of J.S. Bach, John Cage, and Olivier Messiaen in composing music about the body glorified (*le Corps glorieux*), a sense of “body without organs.” This could be achieved musically by connecting the various strata of
the self (emotional, intellectual, sensual, etc.) while communing with a spiritual entity. According to Asplund, Bach played on the cathartic power of music to climactically link the individual’s emotions with the grace of God. John Cage took a nearly-opposite approach by asking musicians to participate intellectually, quieting their senses to allow intellectual spiritual engagement. Messiaen appeals sensually by placing us in the “fabric of eternal existence” and simulating the sensations of the glorified body, allowing our senses and mind to be overloaded. Asplund makes the point that Messiaen achieved this kind of sensual overload organically; that is, he duplicated a phenomenon from the substance of his own experience. In turn, his music realizes a kind of submission to sensory input that allows usually-delineated strata of the self to unite.

Messiaen is not content to merely provide an environment in which communion can occur. Rather, he gives an account, an analogue of his own communion, one that may be incomprehensible (as the sound-color relationship is to most auditors) or ecstatic, depending on one’s openness. This openness is only possible if we place our subjective and significant selves on hold. We must then allow ourselves to be passive receptacles for sensual resonances. This passivity is better described as submission, the kind of submission that models the Christian’s (“nevertheless, not my will but thine”) willing and ecstatic submission to divinity.

This ultimate éblouissement lifts a person out of his or her self, like in the viewing of a stained-glass window, superseding comprehension and affective states. Even the connotative value of symbols is left behind. Perhaps, Asplund suggests, this is why Messiaen’s music can seem so unearthly; unlike Bach or Cage, Messiaen surpasses both human rhetoric and sentiment to flood our senses.

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47 Ibid., 178.
48 Ibid.
Messiaen’s colors took shape as musical notes combined into harmonies. We know that some synesthetes might experience a color for an individual note, but Messiaen’s ultimate goal goes beyond individual sounds, as he specifies:

And as music uses thousands, millions of complexes of sounds, as these complexes of sounds are always in movement, coming and going without ceasing, so too the colors which correspond to them give interspersed rainbows, blue, red, violet, orange, green spirals, which move and turn with the sounds, at the same speed as the sounds with the same opposition of intensities, the same conflicts of duration, the same contrapuntal twists as the sounds. Furthermore, the sounds strike and knock our inner ear, and these multicolored things move and irritate our inner eye, and establish contact, rapport (as Rainer Maria Rilke said) with another reality: a rapport so powerful that it can transform our most hidden “me,” the deepest, the most intimate, and dissolve us in a most high Truth which we could never hope to attain.\footnote{Rossler, Contributions, 63. Translated from the \textit{Conference de Notre-Dame}, 1977.}

His perspective bears a noticeable similarity to Kandinsky’s soul-vibrations and the kind of Romantic correspondences that came before. Messiaen easily made the connection between his colored hearing and evidence of divine Truth. In this sense, we can consider Messiaen a true Romantic synesthete. He was aware that synesthesia was a process of the brain, yet he was convinced that his colors led to God and could be employed musically to lead others to awareness of God. Musicologist Sander van Maas describes Messiaen’s éblouissement as a participatory episode that begs transfiguration of the ear, asking the listener to perceive something outside of the music.\footnote{Sander van Maas, “Forms of Love: Messiaen’s Aesthetics of Éblouissement,” In \textit{Messiaen Studies}, edited by Robert Scholl (Cambridge: Cambridge University Press, 2007), 78-100. Van Maas explores love as a result of éblouissement, along with an ecstatic response. Van Maas also says it is difficult to fit éblouissement into a separate musicological or theological study – the context must be as broad as possible.} The ways in which the music sounds and acts resists classification as either sacred or secular music. In moments of éblouissement, the sacred and non-sacred are indistinguishable, touching each other.
Conclusions: The Beginning

Here, I have considered Messiaen’s colorful experiences, his beliefs, and his music. In the two preceding chapters, I visited the histories of scientific inquiries and the place of synesthesia within the arts. This leads to the question: what is the use of studying synesthesia within music? Why does it matter that a musician would experience and communicate this psychological unity of the senses, especially if his audience does not share his perception? If Messiaen was employing a kind of mystic symbolism in his music, what does synesthesia add to our understanding? Don’t all artists possess license to apply or reject symbolism and color at will?

A renewed interest into synesthesia opens up new ways of considering an artist’s life. First of all, the cognitive aspects of synesthesia had not been scientifically approached in depth until the 1980s. The resulting body of synesthesia literature, particularly strong since around the year 2000, did not exist during the lifetimes of our traditional canon of composers. For the majority of historical musical figures, we can only suspect their synesthesia and hope to find glimpses of evidence in their writings. Due to the historic characterization of synesthesia as a malady and weird abnormality, it is likely that many synesthetic musicians have kept their perception to themselves. The term “synesthesia” is now becoming familiar enough that synesthetic celebrities can publicize their perception: Billy Joel and Lady Gaga are among them. The growing scientific interest in synesthesia and the expansion of psychological and neurological inquiries are opening the gate for questions in the humanities that we have not been able to ask until recently. If synesthesia is vital to a musician’s life, how can we overlook its implications? Additionally, how can we overlook the language of synesthesia within a historical-artistic context?
Messiaen was a musician who was aware enough of his perceptive nature to speak about his synesthesia at length. During the time in which he composed and lectured, it was not popular to study subjective states of mind. Indeed, he just missed the beginning of a new wave of scientific inquiry. Therefore he was aware that the colors of his music were unusual and personal, yet he was unable to explain them as a process located in the brain and only briefly recognized the scientific basis for this. Even today, though we know the brain is responsible for cross-modal associations, it remains unclear whether these originate from an overabundance of cross-talk, low sensory inhibition, or other causes. Neurobiology and genetics will continue investigating the nature of the brain’s hyper-communication and the specific genetic markers that lead to the formation of synesthesias. Psychological research into cognition helps to illuminate the part synesthesia plays in developing abstract, metaphorical, and concrete relationships. Messiaen’s abstract connections to symbols came easily in the form of devotion to Christ and the Catholic faith. But for him, the line between symbolism and reality was very fuzzy. Music was not only symbolically tied to colors; colorful music was his reality. This reality is among a handful of potential reasons to discuss the role of synesthesia in the life of a synesthetic musician. A review of the last twenty years of research into synesthesia can shed some light on the impact it might have on a musician’s or artist’s life.

**Synesthesia and Meaning**

Synesthesia itself makes meaning by being the process that defines relationships. Remember the “Kiki-Bouba” experiment from Chapter One? Researchers have designed comparable experiments that support the link between synesthesia and meaning in synesthetes. Though the actual cue must be present, the meaning of the cue is what determines the synesthetic reaction. In another popular experiment, colored-grapheme synesthetes were presented with the
words “the” and “cat.” The middle grapheme was actually the same in both words but could be interpreted either as an H or an A.

![Image](image.png)

Figure 3.5: Adaptation of stimuli in synesthesia-semantic tests

Interestingly, the participants would describe the middle character’s color either with their H color or for their A color, depending on which word they read. The researchers concluded that the synesthetic experience was thus dependent on the actual function of the character, which in this case, had a distinct meaning related to its context. In Chapter One, I cited that semantic characters could be very closely related across modes for non-synesthetes in the “Kiki-Bouba effect.” Here, for synesthetes, the semantic context is inseparable from the stimulus.

Messiaen revealed this was his experience as well. As he mentioned in interviews with Claude Samuel, he saw the same colors when he heard music and when he read the same music in a score. The eye and the ear are separate organs, yet the meaning of the music was the same. For him, the color of a musical construction was tied to its function. For instance, when Messiaen heard or read the note of C or a C Major chord, he “saw” white purity. To create a moment of pure white, the music that accompanies the Angel and the Angel’s celestial solo is distinctly built upon C Major harmonies. An audience can understand the symbolism of purity or holiness in white as well as the beauty in a moment of clear C Major harmonies. They may even know that Messiaen’s synesthesia automatically combined the sound and color. What we can add
to the equation is that for Messiaen, the color was his reality. The introduction of newer technologies such as Dworak’s three-dimensional computerized models (2010) enables deeper understanding of the nature of a musician’s synesthetic visions as they can be recreated or approximated.

In Chapter One, I also touched on the role synesthesia can play in guiding decisions and tastes. For a colored-hearing musician, this can become foundational. Messiaen recalled a concert he attended in a small town which revealed his sensitivity to sound-color relationships in a way he had not expected. This performance was a ballet set to Beethoven’s music and the set happened to be a luscious garden awash in moonlight. Deep violet lighting was cast onto the stage to set the mood. Since the violet light did not match his synesthetic colors from the accompanying music, Messiaen was quite disturbed, later disclosing that it made him sick to his stomach.52 In Music and Color, where he relates this Beethoven ballet tale to Claude Samuel, Samuel follows up by asking if Messiaen is allergic to any colors. Messiaen responds, “Yes, I don’t like yellow very much.”53 None of his modes contained a single color and more often contained gold rather than yellow, so a pure yellow was avoided entirely. If certain images are more appealing to you, and those images are irreversibly tied to music, then you will likely gravitate towards using music that calls forth those pleasant visuals.

The tendency to ascribe spiritual revelation to synesthesia also points toward its role in developing meaning. It is for this reason that a historiography of artistic synesthesias is useful. As authors, painters, and composers have aspired to create some transcendental language with color, they have sought not only to mimic literal synesthesia, but to convey sentiments deeper than simple associations. Arthur Rimbaud and Charles Baudelaire were hailed for their extra-

52 Messiaen and Samuel, Music and Color, 42.
53 Ibid.
literary vision that made the unknown knowable, bridging that divide with a language of color and symbol. Kandinsky and a generation of color theorists investigated the universality at which an idealized synesthesia proper only hinted. Any way to combine color and movement, in the same way as music was aurally mobile, was another way to speak to the soul. Messiaen possessed a solid grasp of color symbolism and the divine nature of music from Aquinas and St. Francis. Combined with his musical colors, this made a perpetual loop between the symbol and the symbolized (e.g. C Major is white purity and white purity is C Major). This points to a difficulty in categorizing the study of Messiaen’s music; it is inseparable from both color and his religious truth. Musicologist Sander van Maas comments that Messiaen’s color music is a “critical phenomenon residing in between music and religion” and cannot be studied under musicology or theology alone. Messiaen’s relationship with music was formed in the same way as his relationships with the natural world and with the character of divine Truth: through ever-present color and at times through his personal éblouissement. While the discourse on synesthesia may not aid his placement more clearly into one musical category or another, it certainly helps bridge the divide at a convergence of color and truth.

**Final Thoughts**

Ultimately, synesthesia touches more than a musician’s music. It becomes a part of the process of making abstract connections and can ultimately shape a musician’s worldview. When we discuss artists’ lives and attempt to place them in various contexts to help us understand them (socio-political, family, economic, etc.), this is another important context to consider. I am not suggesting psychoanalysis of composers and musicians to boil their decisions down to the

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54 Dann, *False Colors Brightly Seen*, 66-67. In an attempt to create a visual equivalent of music, Sir David Brewster laboriously tinkered over a small ocular device in the early nineteenth century. His efforts bore fruit in 1818, but before his patent application could be completed, his idea leaked to the public. Within three months, hundreds of thousands of kaleidoscopes were sold in Europe.

minute interaction of brain areas. I do, however, encourage greater awareness of the mechanisms of synesthesia and subsequently the fundamentality of synesthesia in a synesthete’s life. Under the broad definition of synesthesia from Chapter One, it is possible that all humans may possess synesthetic capabilities. As Jamie Ward proposes, even the process of mature abstract thought may be caused by miniscule synesthesias connecting images and concepts. The things from which musicians and artists draw inspiration are born from their relationships with the universe as they perceive it.

What’s more, new musical applications of synesthesia are being explored in the twenty-first century. Strikingly, some propose solidarity with both Romantic concepts and literal synesthesia in instructional and historical contexts. In 2000, the interdisciplinary journal *Leonardo* published a series of articles titled “Synesthesia and Intersenses” aimed at exploring the implications of synesthesia within the arts. One article by Michael Poast concerned the “heightened sense of reality” reported by several synesthetic painters.56 After making the connection to colored elements in musical scores from early notation to John Cage, Poast suggested a remodeling of musical notation to include standardized colors. As Poast states, “we need Color Music to express and explore a fresh concept of musical notation and to expand the envelope of new music.”57 He based his recommendation on the near-universal qualities of sound, like lightness and darkness, and the possibility of heightening the musical experience for non-synesthetes. Another “Synesthesia and Intersenses” article revisited Scriabin’s claims to synesthesia based on new knowledge of synesthesia’s operation. B.M. Galeyev and I.L. Vanechkina found that Scriabin did not possess synesthesia proper because his meaning-making mechanism was not associative; that is, his semantics of tonality were derived more from an

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enthusiasm for Theosophy than from the consistency of a synesthetic response. Further articles in this series delve into the use of synesthetic associations for dancers and the consideration of perfect pitch as a form of synesthesia. The concept of intermedia in the arts is becoming a twenty-first-century humanities twin to the cognitive investigations. As the processes of making meaning are being explored, the arts continue to employ sensory experiences taken directly from synesthetic realities.

As research into synesthesia carries on, new insights will be gained into the role of perception and the implications of synesthesia in the life of an artist. For musicians, particularly those with colored-hearing synesthesia, emerging research will be valuable to place them within a context that encompasses the world as they view it. Ultimately, recognition of synesthesia as psychology, reality, and metaphor enriches the historical-artistic narrative in a fresh way, opening another interdisciplinary gateway for history and musicology. What’s more, this growing interest opens another avenue of dialogue with living synesthetic musicians who may contribute to the writing of their own histories.

59 Ox, Jack. 1999. “Color Me Synesthesia.” Leonardo 32 (1): 7-8. The boundaries are blurry between colored-hearing synesthesia and perfect pitch. Perfect pitch is a separate yet related ability; colored-hearing synesthetes may use their colors to identify pitches, but perfect pitch persons may detect pitches on the basis of non-colorful sensations. Both perfect pitch and synesthesia seem to be genetic traits. For further discussion, see Cytowic, Wednesday is Indigo Blue, 95-98.
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BIOGRAPHICAL SKETCH

Christine Bronson is a pianist and multiple synesthete from the Seattle area. She was born in 1987 and began piano lessons at the age of seven, developing a love for all sorts of music making. Christine attended Inglemoor High School in Kenmore, WA, where she sang with a women’s madrigal ensemble. She went on to study piano performance with Jill Timmons at Linfield College in McMinnville, OR. During high school and college, she competed in local piano contests, taking first prizes in events such as the Northwest Chopin Festival and Solo and Ensemble festivals. In 2007, she first came across the word “synesthesia” while learning Olivier Messiaen’s Préludes for piano. This sparked her interest into the mechanics of synesthesia and its implications in musical and creative contexts. While attending Linfield College, Christine became more involved in musical organizations and advising, serving as president of the choir and as class representative in the Music Student Advisory Council. She graduated summa cum laude in 2009 and was honored as Peer Advisor of the Year for her commitment to teaching freshman orientation classes. Most recently, Christine has pursued a Master’s degree in Musicology at the Florida State University and plans to graduate in May 2013. After completion of her Master’s, Christine will return to the Seattle area, where she will marry her patient fiancé Troy Fisk and resume hiking.