Advances in Social Science, Education and Humanities Research, volume 559
Proceedings of the 2nd International Conference on Language, Art and Cultural Exchange (ICLACE 2021)

The Technological Revolution of the Coloured Organ in Alexander Scriabin's Fifth Symphony, *Prometheus, Poem of Fire*

Kuo-Ying Lee[1,*]

[1] *College of Music, Zhaoqing University*
kuoyinglee@hotmail.com

ABSTRACT
The Russian Composer Alexander Scriabin (1871-1915) is considered as one of the most exceptional composers because of his innovations in musical works that possess synesthetic aesthetics and modernist techniques. Particularly, in the score of his fifth symphony, *Prometheus, Poem of Fire, Op.60 (1910)*, Scriabin annotated a part designed for the coloured organ to simultaneously produce the colour lighting in the performance. This creative idea pioneered the multimedia application in the field of performing arts, and delivered a new concept in the music literature. This study will illustrate where Scriabin's colour-light idea was originated from and how he put his synesthetic idea into practice. The technological revolution of the coloured organs will be addressed in the study to explore the challenges and solutions in the process of Scriabin's productions of his fifth symphony.

Keywords: *Technical Revolution, Coloured Organ, Scriabin's Fifth Symphony*

1. SCRIABIN AND SYNNESTHESIA

Scriabin had a very multidisciplinary compositional aesthetics concerning his musical concepts that often associate with other aspects of culture and civilization. His widespread interests are revealed by the philosophical, poetic, and mystic content in the music style. Particularly, mystical philosophy inspired Scriabin's compositional ideas, and he was specifically influenced by the Russian mystic philosopher Vladimir Solovyov and occultist Helena Petrovna Blavatsky (1831-1891). Solovyov advocated that the artist is the "instrument of God's revelation of his unified existence", and he believed that the extrasensory revelation existed and the visible world was a universe of sensual phenomena [1]. Blavatsky's theory emphasizes the relationship between unexplained symptoms of Nature and man's potential powers. She was one of the Theosophical Society founders with the aim to explore the spiritual world and prehistoric monographs of ancient cultures. Adopting this theosophical idea, Scriabin considered himself destined to transfigure the world of sensual phenomena through artistic creativity [2].

1.1. Overview of Scriabin's Compositions

According to the current scholarly findings, over the course of Scriabin's life, he only wrote piano and orchestral works. Most of his musical works in early compositional stage were influenced by Frédéric Chopin (1810-1849) with respect to the melodic and harmonic style. His own musical vocabulary was gradually formulated since he revolutionary broke the traditional rules of the tonal system by altering the triad-oriented harmonic scheme to a fourth-based system. Thus, Scriabin's compositions illustrate his transformative ideas from tonal to atonal music. Much of his works is in depictions of a multisensory view, which domains the most music content. Scriabin's multiple interests that span from philosophy, literature to theology along with his personal synesthetic experience greatly influenced his compositions. Historically, the fact whether Scriabin a true synesthete or not remains unknown as he was considered mentally abnormal, particularly in his last years. However, he undoubtedly created the music genre embracing audio sonorous effect, visual imagery, and symbolism altogether in art work as a whole. Many pieces of Scriabin are symbolic in synesthesia. For example, *The Divine Poem* (1905), *Poem of Ecstasy* (1908), *Prometheus, Poem of Fire* (1908-1910), and

Vers la flamme (Toward the Flame, 1914) all suggest a mysterious multisensory perception. Although the traditional musical idioms are observable in Scriabin's earlier symphonies and piano pieces, his late works are remarkably unique in the music literature.

1.2. Synesthesia

Synesthesia means additional sensational condition in which one cognitive pathway involuntarily triggers another one or more sensory pathways. As the matter of face, the cross-modal correspondences had long existed before the phenomenon of synaesthesia was officially introduced to the public in 1812 by Georg Sachs [3]. The earliest cross-modal monograph can be discovered in Plato, Aristotle, and Pythagoras' statements with philosophical discussions [4].

2. *PROMETHEUS, POEM OF FIRE*, OP.60

Scriabin's fifth symphony, *Prometheus, Poem of Fire, Op.60*, was composed during the years from 1908 to 1910. It has two editions respectively published in 1911 and 1913. The second edition was called the Parisian score and in its full score, there is particular a part designed for a colour organ which translated the notation into coloured lighting instead of sound. The colour organ was also called *clavier à lumières* or *Luce*, which was an instrument-like device designed for the performance of *Prometheus*. It functions like a piano, but produces only coloured lighting without any sound into the auditorium on a screen in the concert hall. There is a supplementary stave designated for *Luce*, in which certain harmonies correspond to different colours with a spectral order. The *Luce* part in Scriabin's *Prometheus* displays the shifted root notes of the Mystic chords, indicating the colour changes and specific spiritual meanings [5]. The Mystic chord is the primary feature in *Prometheus* and it has variant combinations, appearing throughout the entire work. It was a chord comprised of six notes that construct intervals of two augmented fourth, a diminished fourth, and two perfect fourths. The Mystic chord was coined by the British scholar Arthur Eaglefield Hull (1876-1928), firstly appeared in Prometheus in the history. Theoretically, the Mystic chord has unique sonority beyond the traditional tonal harmonic progression, and Scriabin utilized the technique based on the Mystic chord in most of his late works.

2.1. Compositional Intent

Scriabin's *Prometheus* symphony was inspired from the ancient Greek myth of Prometheus, characteristic of Scriabin's belief in Mysticism. In addition to the systematic logic created by the Mystic chord, this piece also displays the hidden meaning behind the myth of Prometheus. In the ancient Greek legend, Prometheus indicates a start point of the human life, and a symbol of self-consciousness to man. The metaphorical portrayal of the sinful and divine aspects of the humanity can be found from the bimodality in dissonant sonority. Frome a theosophical point of view, Scriabin's *Prometheus* symphony seems deliver an evolutionary cycle of the main character in the myth by the expression of the cyclic thematic Mystic chord. Helena Petrovna Blavatsky had stated s philosophy in relation to the theosophical ideology. In Blavatsky's *The Secret Doctrine*, she believed that the spiritual meaning of the Prometheus myth reveals an analogical process of bearing necessary sufferings toward the perfectibility [6]. In a broad way, Prometheus also presents the spirit of creativity, which requests a certain intensity of will, wisdom, and diligence.

2.2. Historical Reception

Scriabin's fifth symphony was scored for an orchestra, chorus, a solo piano, an organ, the tubular bells, and the coloured organ. It was premiered on March 2, 1911, with Scriabin playing the solo piano part. However, the coloured organ part was not performed because of the technical limitation [7]. Later, on January 2, 1913, the work was performed again without the coloured organ part in London. According to Eaglefield A. Hull, the London debut concert had to play the piece twice to make the second performance more comprehensible to the audience. Significantly, when the work was eventually performed along with the coloured organ part on March 20, 1915, at Carnegie Hall in New York City, approximately a month before the composer's death, the New York Times published an article addressing the revolution of colour rays and distinct sonorous effect [8]. Nowadays, with the increasing growth of multimedia devices, Scriabin's fifth symphony receives more scholarly attention concerning its synesthetic concept and distinct sonority.

3. COLORED ORGAN

The predecessor of a coloured organ is the colour-light keyboard, and it first appeared in the 18th century [9]. The invention of the coloured-light keyboard was inspired by the scientific perspectives of colour theories.

3.1.Theories of Sound-Colour Correspondences

Scriabin's designation for coloration was influenced by the Russian philosopher, Helena Petrovna Blavatsky, whose held theosophical points of views for the spiritual state to each colour in corresponding to specific key. According to *The Secret Doctrine*, Blavatsky linked the colour of red with the compound Sanskirt word "Kâma Rûpa", or "Wish of Form" to designate mental and physical desires of human beings. The "Kâma Rûpa" also corresponds to the note of C on the musical scale.

Blavatsky claimed that the colour red contains all potentialities of Matter, and it is the start-point on the earth. The complementary colour of red is the colour green, correlates to the idea of "Lower Manas", or "Self-Consciousness" which is equivalent to humankind's mind [10].

3.2. Chronological Discoveries

The predecessor of the coloured organ is also called colour-light keyboard, and the earliest colour-light keyboard was documented in the 17th century, invented by the French mathematician Louis Bertrand Castel (1688-1757), who called his invention "ocular harpsichord". Castel's colour-light keyboard was inspired by the theory declared in the treatise *Opticks* (1704) of Isaac Newton (1643-1727). Newton associated the seven colours of red, orange, yellow, green, blue, indigo and violet with the seven basic degrees of the musical scale based on the reason that both sound and colour-light travel in waves, possessing wavelength, frequency and amplitude [11]. Unlike Newton's theory by measurement of light through looking at spatial case, Bertrand Castel stated in his treatise *Optique des couleurs* (Colour Optics, 1740), claiming that the distance of a prism determines the colours of white light. Subsequently, Goethe (1749-1832) published his *Zur Farbenlehre* (Theory of Color) in 1810. In this book, he proposed a thesis concerning the melody of colours based on Castel's research. In contrast with Newton's physic standpoint about colours in the pre-existing studies, Goethe examined the coloration from a philosophical point of view, and he added the psychological properties to the coloration [12]. Goethe's thesis was developed by the Austrian philosopher, Rudolf Steiner (1861-1952), who established a colour wheel which later became an important reference in Scriabin's fifth symphony.

4. THE TECHNOLIGICAL REVOLUTION IN *PROMETHEUS*

4.1. Function of Coloured organs

There are several inventors working on coloured organ prior to Scriabin's fifth symphony. In addition to Castel's ocular harpsichord, the Scottish physicist Sir David Brewster (1781–1868), and the American inventor Bainbridge Bishop (1837-1905) all contributed to build up colour-light keyboards. Castel used a candle-illuminated coloured prism to demonstrate a systematic correlation of colours when certain pitches were played by the organ. As the effect of the coloured prism was far away from Castel's ideal, his continuous experimentation included the utilization of mirrors and numerous lamps behind coloured glass filters. Although Castel's work did not meet his satisfaction, he made a pioneering research on the colour-light keyboard. In 1817, the kaleidoscope's inventor, the Scottish scientist Sir David Brewster (1781–1868), tried to apply the kaleidoscope as a basic form of the coloured organ, which reflected various colours from an object when it moved across the angular aperture [13].

In 1877, the American scientist Bainbridge Bishop's coloured organ is the first case adopting the motor device to produce the simultaneous link between the sound and colours. According to Bishop's notes in the research paper, *The Harmony of Light*, there was a screen above his coloured organ, and an attachment connected to the instrument. The coloured light would be projected when the key was pressed, and the pedals as well as the stops of his organ functioned as hue adjustments according to tonal regions and key changes. Bishop's invention contains both artistic and pedagogical purposes [14].

4.2. Challenges and Solutions in Prometheus

It is believed that both the British artist Alexander Wallace Rimington (1854-1918), and Scriabin's friend Alexander Mozer helped him to fulfil the synesthetic idea in his fifth symphony, particularly for the 1911 premiere. The term "coloured organ" was first applied as a patent by Rimington in 1893. He began to construct the coloured organ before collaborating with Scriabin. In his book, *Colour-Music: The Art of Mobile Colour* (1911-1912), he elaborates his understanding of sound-colour analogies with designation of the lighter colours for higher register of keys, and vice versa. His coloured organ was three-meter high, possessed five-octave keyboards and fourteen arch lamps with filters that produce different colours with additional devices attached to the organ stops to control the brightness and luminosity rather than sound [15]. As the matter of fact, Scriabin's fixed sound-colour correspondences were different from Rimington's perspectives, but they shared the similar synesthetic concept. Alexander Mozer's contribution to the *Prometheus* symphony was his supportable device of crude circle of coloured light bulbs builted on a wooden base, with it Scriabin experimented in private [16]. Later, he also built a larger body of the coloured organ for Scriabin. The biggest challenge in portraying the synesthetic idea by the coloured organ in a performance is the fact that it has to be played along with a real organ at the same time for the musical sound.

The premiere of the *Prometheus* symphony in 1911 was not successful as the coloured organ did not undertake the coloured lighting as predicted. After the premiere, the following performances of Scriabin's fifth symphony were not accompanied with the coloured organ part because of the same technical problems until the performance took place in Carnegie Hall in 1915. The 1915 performance was accomplished by the assistance of the Electrical Testing Laboratories in

support of the construction of the colour-organ projection instrument named *chromola*, supervised by the technician Preston S. Millar. Unlike Rimington's coloured organ with specific sound-colour correlation, *Chromola* is an instrument able to produce twelve different colours without a sound-colour mapping. Since Scriabin's indications for Prometheus was vague, and the screen for the 1915 performance was too small, and therefore the reception was not quite successful. The entire work was later performed with replacement of white curtain for the small screen [17]. Nowadays, with the explosive development in technological equipment such as smart projector, LED displays, and image detectors, Scriabin's *Prometheus* is able to be presented in a more convincing and understandable way.

5. CONCLUSION

Scriabin's fifth symphony features unique application of coloured organ, which displays a culmination of sound arts, illuminating colours, theosophical spirits and scientific views. The technological evolution of Scriabin's fifth symphony anticipated the modern perspectives of the multimedia presentation of performing arts. The invention of the coloured organ not only has historical significance, but also stands for a new genre of art work. I hope this study will inspire more in-depth investigations on the development and application of the sound-image corresponding compositions.

REFERENCES

[1] James West, Russian Symbolism: A Study of Vyacheslav Ivanov and the Russian Symbolist Aesthetic, Methuen and Co., 1970.

[2] Faubion Bowers, Scriabin: A Biography (Volume 1), Dover Publications, Inc., 1996.

[3] Jörg Jewanski, Julia Simner, Sean A. Day, Jamie Ward, "The Development of a Scientific Understanding of Synesthesia from Early Case Studies (1849-1873)", Journal of the History of the Neurosciences 20 (2011) 284-305. DOI: https://doi.org/10.1080/0964704X.2010.528240

[4] Aristotle, On Sense and the Sensible, Translated by J. I. Beare, Clarendon Press, 1931.

[5] Eaglefield A. Hull, A Great Russian Tone-Poet: Scriabin, Kegan Paul, Trench, Trubner, and Co., LTD., 1916.

[6] Helena Petrovna Blavatsky, The Secret Doctrine: The Synthesis of Science, Religion, and Philosophy (Volume 2), Cambridge University Press, 2011.

[7] Agustin Muriago, Re-envisioning the Piano Recital: An Audiovisual Alternative, DMA Thesis, John Hopkins University, 2017.

[8] Kenneth Peacock, "Instruments to Perform Color-Music: Two Centuries of Technological Experimentation", Leonardo 21(4) (1988) 397-406. DOI: https://doi.org/10.2307/1578702

[9] Donald Schier, Louis Bertrand Castel, anti-Newtonian scientist. Iowa: The Torch Press, 1941.

[10] Helena Petrovna Blavatsky, The Secret Doctrine: The Synthesis of Science, Religion, and Philosophy (Volume 2), Cambridge University Press, 2011.

[11] Isaac Newton, Opticks, Dover Publications Inc., 1997.

[12] Johann Wolfgang von Goethe, Theory of Color, Translated by Charles Lock Eastlake, John Murray, 1840.

[13] Kuo-Ying Lee, "Synesthesia and the Color-light Keyboards", International Journal of Management and Humanity 10 (10) (2019) 47-50. DOI: https://doi.org/10.35940/ijmh.D1203.125420

[14] Bainbridge Bishop, A Souvenir of the Color Organ, with some Suggestions in Regard to the Soul of the Rainbow and Harmony of Light, The De Vinne Press, 1893.

[15] Alexander Wallace Rimington, Colour-music: the Art of Mobile Colour, Hutchinson & Co., 1912.

[16] Daniel Conrad, "The Dichromaccord: Reinventing the Elusive Color Organ", Leonardo 32(5) (1999) 393-398. DOI: https://doi.org/10.1162/002409499553631

[17] Kenneth Peacock, "Synesthetic Perception: Alexander Scriabin's Hearing", Music Perception 2 (4) (1985) 483-506. DOI: https://doi.org/10.2307/40285315