

# Data-Base Art from DADA: Mapping Kurt Schwitters' Sound-Poem, The Ursonate, into a 73 square meter Painting

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## Abstract

*Database Aesthetics* is now a catchword in the digital world. It poses linguistic questions about the field of research and art relating to databases themselves. There are many different kinds of databases; these include books, libraries, museums, and musical scores.

This is my story of working with a non-digital database. The original visualization database was a cassette tape of Kurt Schwitters' original recording of his Ursonate from the 1930s. If you want to use the term from generative art,

you can call the tape the seed of the visualized sound-poem. As there was no previous score of the musical patterns used by Schwitters, I developed the elements in the recording to create a handmade score, including Schwitters' pitch levels and note values incorporated into a typical western notation system. I then expanded the score database to analyze the German phonemes that Schwitters used as 'words' in his sound poem. I mapped the vowel sounds of the phonemes to the human vocal tract producing the fourth database, which is the systematic, transparent colors applied to the images. Finally, the last database consists of images that produce a cognitive space transfer showing likely pictures that could have been in Schwitters' mind during and around the creation of the Ursonate. All of these layers of information are finally put together through a process of conceptual blending.[1] [i]

## Introduction

Over thirty-five years, I developed mapping systems that create equivalences between musical scores and visual performances. Therefore, I

had to know how to read and analyze music; that was part of my research. I studied harpsichord and learned to read music and keyboard harmony through training in thoroughbass, a form of musical notation where the lowest note in a chord is named by its interval placement in the chord. I also studied music theory at the Manhattan School of music.

In 1990 I began to research Kurt Schwitters' Ursonate to visualize Schwitters' own performance; I had recently moved from NYC to Cologne, Germany. The only published version [2] [214-242] of the Ursonate was a concrete poem constructed by Jan Tschichold, the Swiss typographer. Although this form is entirely appropriate in the context of the Ursonate's existence as an intermedia piece[i], it does not give any pitch or dynamic information; however, it does group the repeated syllables into blocks of text that are valuable for performance.

### Creating the Score (Ox 1993) [3]

I needed to find an actual performance for my analysis [iii]. Michael Waiswicz, the director of STEIM in Amsterdam, gave me an unknown version recorded by Kurt Schwitters himself. GIMIK, the computer-music research and performing organization in Cologne, could not analyze the tape for accurate pitches because of the hissing and clicking from the original shellac recording. Therefore, Kai Schönburg, a percussionist with perfect pitch, wrote down each note he heard in time value and pitch in a handmade score. Here is one page out of forty-two.

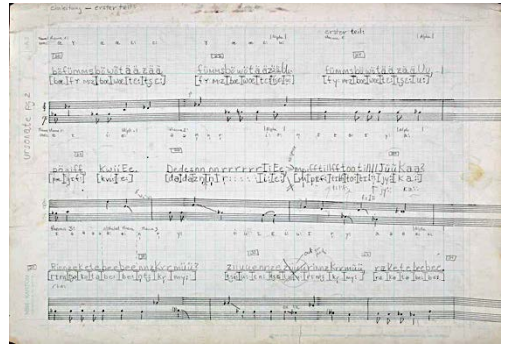


Figure 1: This is one page out of 42 handmade scores showing Kurt Schwitters' actual performance. [iv]

Since the 'lyrics' of the Ursonate are composed of German phonemes, I needed to learn phonetics. At the Phonetics Institute, University of Cologne, under Georg Heike, I made a complete phonetic analysis with the patient and generous help of Angela Fuster-Duran (translating Schwitters' recitation into actual phonemes). Figure 1 includes the phonetic score. This information is encoded in the painting through collaged image manipulation, including consonants, syllabic construction, and glazes (transparent layers of color) that I mapped from a color chart based on the human vocal tract. See Figures 2 and 3 for the collage and color charts.

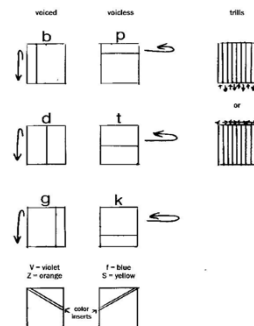
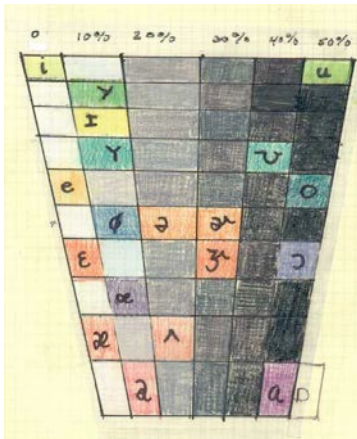


Figure 2: Cutting and fracturing patterns of image fragments for consonants.

Consonants are realized through internal image manipulation. The articulation (e.g., plosive, fricative, trill) are rendered in the different cuts and/or separate color inserts and the turning around of image segments. Voiced consonants are distinguished from voiceless ones by opposing directions of cuts. Each fricative has its own color insert (f = cerulean blue, z = orange, v = violet, and s = yellow). The place of articulation of plosives (p, b, t, and d) is seen through the cutting point's location. Approximates (h or j), or vowels that stand alone in a syllable, have no internal cuts.



*Figure 3: The twelve-step color wheel mapped to a diagram representing the human vocal tract.*

All vowel sounds are expressed through the glazing system that I remapped from earlier visualizations of music. I had mapped the twelve-step color wheel based on red, yellow, and blue primary colors, on the circle-of-fifths, thereby showing modulations of musical keys through color changes. Figure 3 maps the sixteen vowel sounds from German onto a chart representing the human vocal tract. The front of the mouth is on the left side and moves to the back of the

throat on the right side. At the top of the chart, the tongue is in its highest position in the mouth during vowel production. As the tongue moves down, the colors shift from lighter to darker. I divided the color chart into two lists: the warm colors represent unrounded vowels, and the cool colors are the rounded vowels; these two lists come from opposite sides of the color wheel. Now you can recognize the unrounded vowels like 'i' and 'e' (are your lips rounded when speaking a vowel or not?) and the rounded vowels like 'o'. Vowels produced in the front of the mouth (the left side of the chart) are the pure color, but as they move to behind the teeth, they have 10% of their complementary color in the glaze mixture. In the center of the mouth, vowel production has 20% and then 30% of the complementary color, increasing to 40%, then 50% in the back of the throat. Diphthongs slide between two colors in a blend as the vowel sounds also move smoothly.

## Cognitive Space Transfer

The mechanism that enables the viewer to see the above-described mapping components and the soon-to-be-described pitch and dynamic (loud/soft) values are my use of images that may have been in Schwitters' consciousness as he composed his work. However, I used my artist's prerogative by including images from England when he had already completed the Ursonate, expanding this database to include the last years of his life. The landscapes around Hanover, where he created the Ursonate over ten years, are not very interesting. Schwitters would have spent time in Norway during that period, and I researched the places with a Norwegian Schwitters scholar, Jutta Nestagard. The director of the Henie Onstad Kunstsenter

Museum in Hovikodden, Norway, connected me with her. Photographs show Schwitters sitting in the mountainous landscapes I included in the Ursonate visualization (Figure 4). I was able to visit the Norwegian island of Hjertø, just off the coast of Molde. The hut is considered another Merzbau. I used the image on the wall there (Figure 5) to represent the alphabet theme when Schwitters recited the German alphabet backward four times at the end of the Ursonate. [v]



*Figure 4: Theme 3—Rinnzekete bee bee nnz krr müü? ziiuu ennze, rinnzkrmmü, rakete bee bee. Electrostatic transfer on mylar, 80 x 216 cm.*



*Figure 5: Alphabet Theme—Zätt üpsilon Wee fau Uu Tee äss ärr kuu Pee änn ämm Ell kaa li haa Gee äff Ee dee zee bee. Electrostatic transfer on mylar, 58 x 181 cm.*

I traveled to the Midlands in the UK, where Schwitters lived after being released from Hutchinson's 'enemy alien' camp on the Isle of Man. He was first in London, but he felt more comfortable in the Lake District landscapes of Ambleside and Elterwater, where a barn at Cylinders Farm, owned by Harry Pierce, Schwitters created the "Mertz Barn," the last of his "Merzbauten." Researching where Schwitters was, I found the little bridge of which Schwitters

had made a painting; he painted landscapes and portraits to survive economically. This landscape represents a theme in the scherzo (third movement).



*Figure 6: Theme III and 8—Lanke trr gll pe pe pe pe pe Ooka ooka ooka. Electrostatic transfer on mylar, 70 x 185 cm.*

I photographed the trees below by lying on my back on the ground beside the Merz Barn in Elterwater. This theme is used at the end of the first movement and frequently in the fourth movement. The theme is Tatta taata tuiEe tuiEe.

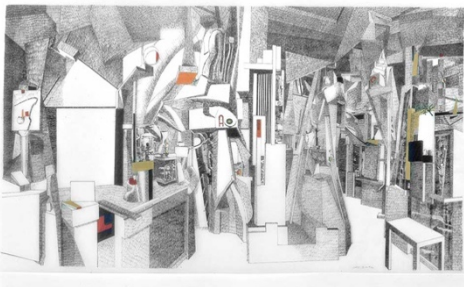


*Figure 7: Theme 13—Tatta taata tuiEe tuiEe. Electrostatic transfer on mylar, 76 x 136 cm.*

The final sources for images used in the visualization are Schwitters' various Merzbauten, the first one built in Hanover, Germany, which he started in 1920 and was bombed to destruction in 1943; this is the most important image in my visualization. I worked from three black and white photographs supplied to me by the Sprengel Museum, including time spent in that museum's reconstruction of the original Merzbau by Peter Bissegger. The reconstruction was

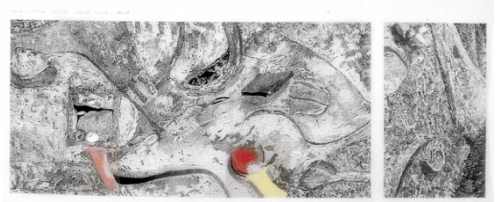


at the instigation of Dr. Harald Szeemann for his curated exhibition—"The Tendency Towards the Total Work of Art" in the Kunsthaus Zurich, traveling also to Düsseldorf, Vienna, and Berlin in 1983. Bissegger made two versions, one permanent at the Sprengel and the other a traveling version. [vi] According to Schwitters' son Ernst, his father built the Merzbau when he was creating the Ursonate for ten years. I used my rendition for the most important theme, *Fümms bö wö tää zää Uu, pögiff, kwiEe* (with the Uu, and Bee letters coming from the Alphabet theme, while Aa is a landscape theme). Ernst Schwitters remembered the colors because he was present and helpful as his father constructed the installation.



*Figure 8: Theme 1 Fümms bö wö tää zää Uu, pögiff, kwiEe. Electrostatic transfer on mylar, 88 x 160 cm. Handcolored.*

Following is my rendition of the Merz Barn wall that was moved from the barn on Cylinders Farm to prevent the destruction of this incredible, last work of Kurt Schwitters. The sculpted wall is now located at the University of Newcastle's Hatton Gallery since 1965. I traveled there and made photographs to create the next drawing, representing themes 12 (on the left side) and 14 (on the right side).



*Figure 9: Themes 12 and 14— Tilla loola luula loola and Tilla Lalla tilla lalla. Handcolored electrostatic transfer on mylar, 80 x 174 cm.*

Below is a photograph of Kurt Schwitters and Hilde Goldstein outside of the Merz Barn from around 1946.



*Figure 10: c. 1946. Photo © K und E Schwitters Stiftung, Hannover*

How did I know which theme to assign to which image? Once again, as an artist, I had no trouble aligning image to sound. I discovered later that there is a known synesthetic response between sounds and images. A well-known experiment shows how sound to shape and shape to sound mapping is a universal human phenomenon. The Bouba Kiki drawing was first developed by Köhler [4] and further developed by Werner [5][6][7]. They showed that 95% of global respondents tie the word Bouba with the bulbous drawing on the left in Figure 11 and Kiki, with its sharp k sound, to the pointy, sharp picture on the right. This experiment demonstrated the cross-modal connection in the brain with its universal interpretation of specific sounds

into images and vice versa.

cadmium citron-yellow for the shortest breaths to a cadmium red deep for the longest breaks. One frequently sees segments of these bright colors in Schwitters' collages; however, here, they are always precisely cut rectangles.

Figure 11: Bouba Kiki diagram [8][1]

### Creating Pitch, Dynamic levels, and Rhythm [3]

I superimposed vertically drawn lines over the image themes to delegate a specific horizontal section to each syllable. Therefore, the viewer can recognize the syllable through repeated exposure to the patterns. Where the image is taken from (upper or lower parts of the vertical column) is determined by the pitch level Kurt Schwitters voiced in his performance recording. The amount of image used on the horizontal plane is determined by the dynamic level at a particular point. If a syllable is spoken loudly, its scale is greater, with less image filling a specified amount of space. If spoken relatively softly, the image is a smaller scale, therefore using more of the original theme image. However, whenever a particular syllable is spoken, it always comes from the same image vertical column.

The rhythm of the Ursonate is easily discernible by an equivalence of space and time relationships. Because it consists of only one line, I felt that the pauses between spoken fragments were essential to the rhythmic feeling. Therefore, I have used solid blocks of various cadmium colors, moving from a

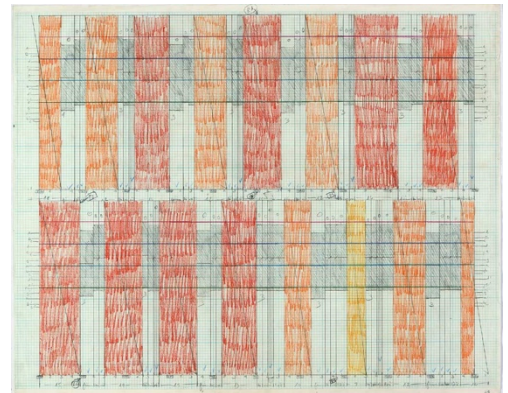


Figure 12: This is # 24 out of sixty pages of scores used to construct the painting. The colored sections show Schwitters' performance pauses, and the numbers below the fracturing pitch patterns of segments show the dynamics. These refer to the scale of the image in that particular segment. The height level of each rectangular unit is a reverse of the 'melody' because when I constructed the final rectangular format, what started as higher in this diagram is seen as a lower section. To see all sixty of these scores, please put this URL into your browser: <https://www.jackox.net/pages/Ursonate/UrlIndex.html>

Source Domain	Target Domain
Time: one second	→ Space: one inch
Voice sounding.	→ Images from Schwitters's Merzbauten (installations) or landscapes that would be familiar to him. All images are divided into vertically separated areas marking each phonemic's realm in the theme/image. They are also marked with pitch levels so that the image can be taken from the appropriate horizontal starting place.
Voice not sounding: silence or pause.	→ Solid colored sections, which are determined by the length of the silence, ranging from light yellow for a breath, to deep red, for around two seconds.
Pitch changes	→ Directional shifting of image sections, up for pitch rise, down for falling pitch.
Dynamic changes: softness graduating up to loudness in a four-step scale.	→ For a louder section, the image appears at a larger scale, therefore seeing less of the image. Softer sounds show more of the image at a smaller scale.
Vowel Sounds: There are 16 German vowels.	→ Transparent colors painted over phonemes based on a system determined by the tongue height and the forward-backward position of where the vowel is created in the vocal tract. Diphthongs are softly blended on their edges as the speaker moves from one vowel to the next. All rounded vowels come from the cool side of the color wheel, while unrounded vowels are from the warm side.
Consonants:	→ Collage patterns and image manipulation including color inserts for fricatives.
Plosives	→ A voiced plosive has a vertical cut in the image section, the location of which is determined by whether it is a "b" or "d", and the right section is upended. Un-voiced plosives, such as "t" or "p", are sliced horizontally in different places, with the upper segment turned around.
Fricatives	→ The voiceless "f" has a diagonal cut from right to left in the top half of the image segment, with a thin strip of cerulean blue inserted, and "s" has a strip of yellow inserted in the cut. The voiced fricative "v" is cut from left to right, diagonally in the top half of the image segment, with a strip of violet, and "z" is the same direction with orange inserted.
Trills	→ Trills call for cutting the segments into 1/2 inch segments. Either every second one is upended, or the same image was painted forwards and backwards, and the trill strips alternate between strips from the two different paintings.
The themes of the Ursonate:	→ Each theme has a different sound and feeling. Each image was chosen by the artist for a correspondence between the lines and patterns drawn aurally by Schwitters and the visual lines and patterns perceived in the drawings of Ox.

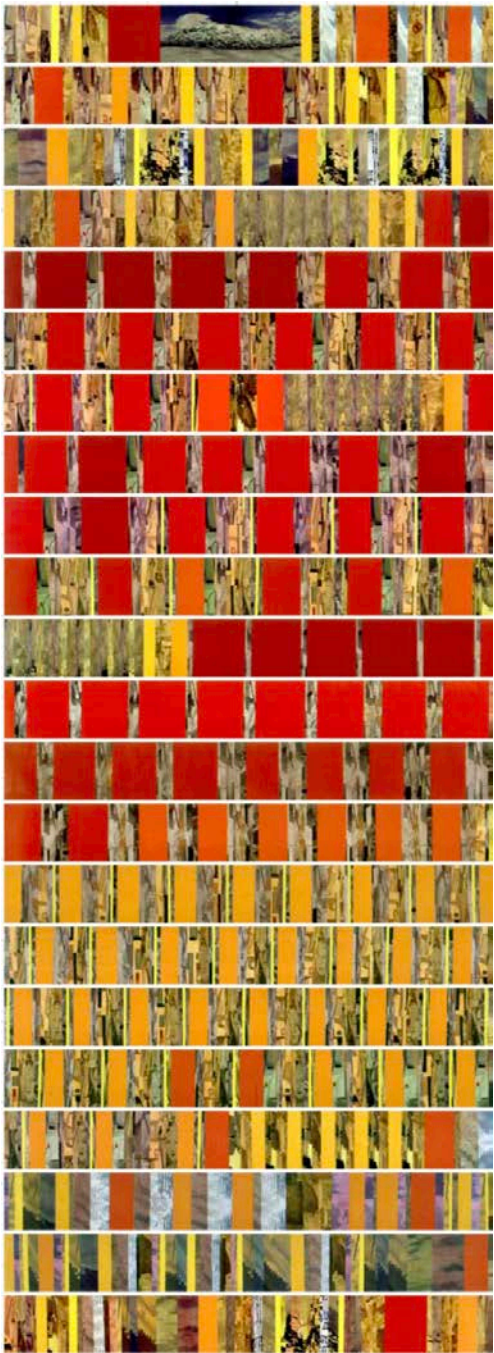


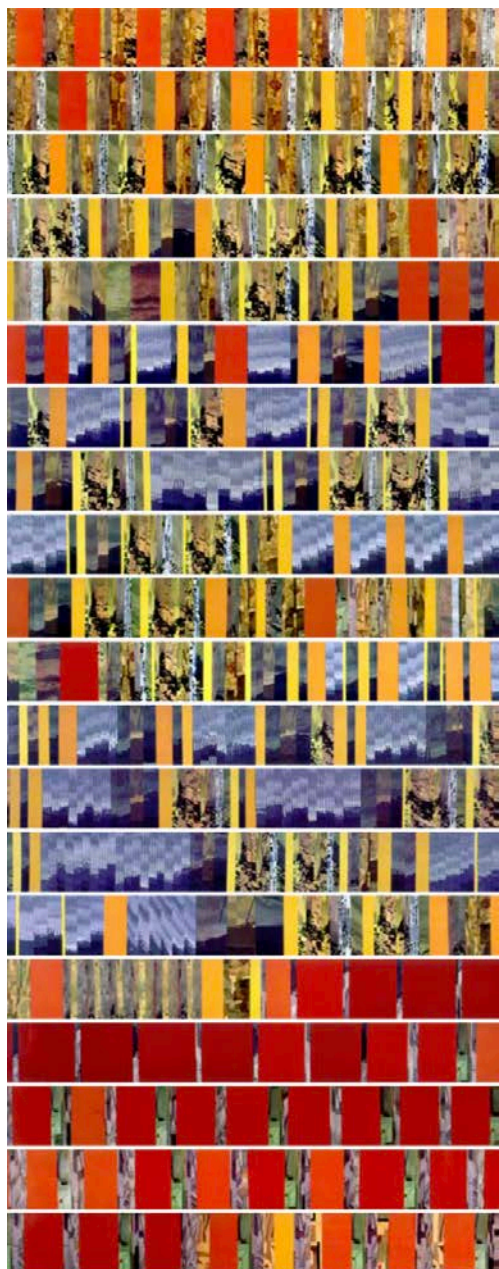
Figure 13: [9] Mapping patterns from the source domain (Kurt Schwitters tape of his performance from the 1930s) to my visualization of Schwitters' performance.

The following images are 245 cm (8 feet) lines of the finished painting. The first movement is more than half of the complete sonata; the second and third movements are not long, so they are complete in these pages; the fourth is one-third of the entire painting and is also complete.

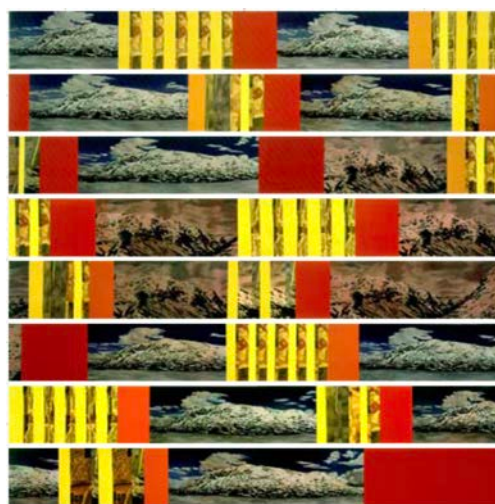
From the First Movement:

Continuing from the First Movement:

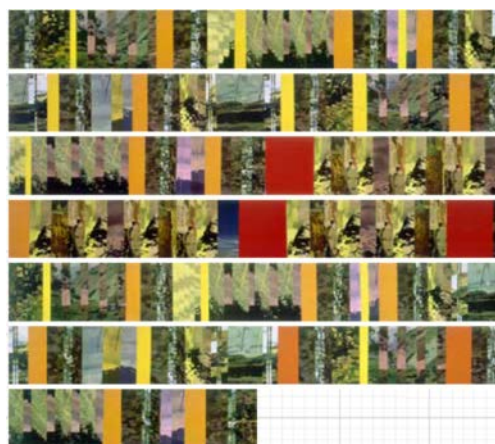




The Second Movement:

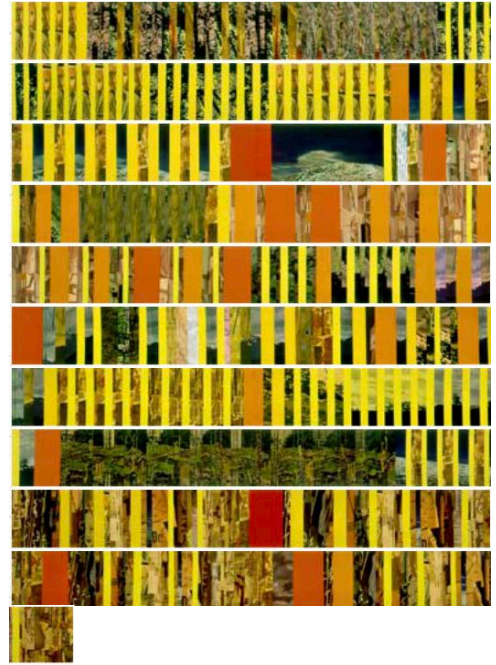
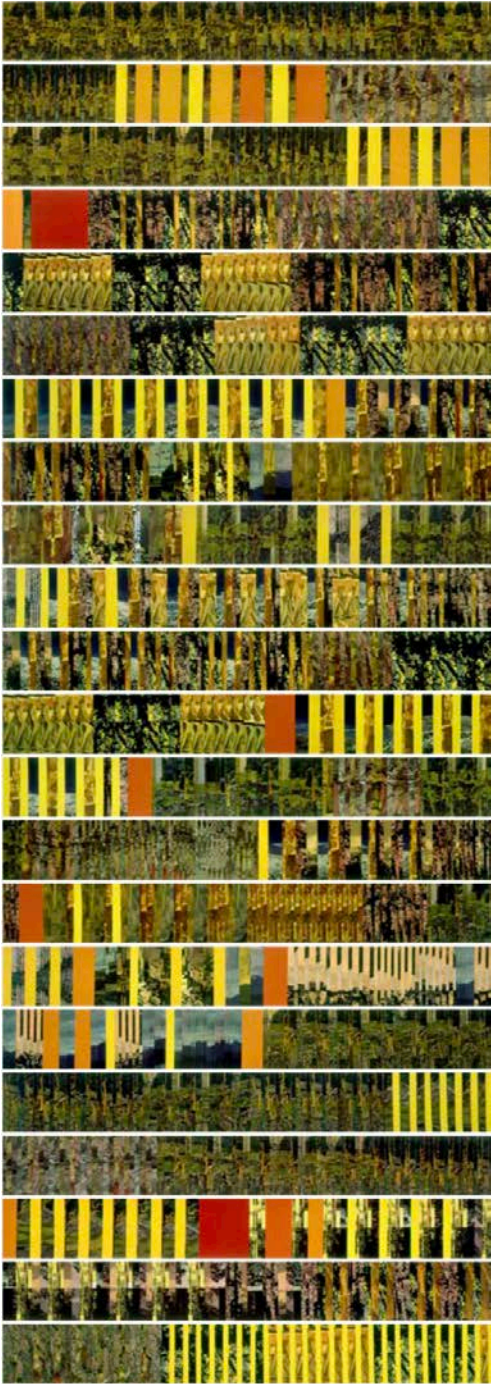


The Third Movement:



The Fourth Movement:





## Notes

[i] A conceptual blend is produced through a double-scope network. The contents from two or more mental spaces are combined so that the result is emergent; it is more than the sum of the parts. It is not a mapping process like the conceptual metaphor. In the brain, this process is called *neural binding*.

[ii] Intermedia is the occurrence of two or more media in one medium. In this case, Schwitters has combined sound poetry with a four-movement sonata form.

[iii] In the 1960s, Jaap Spek, a Dutch sound engineer, worked in Cologne's WDR electronic music studio for Stockhausen. Spek found a recording from the 1930s by Kurt Schwitters himself in a storage closet, which has since disappeared. He gave a copy to Dick Raaijmakers, the Studio for Electronic Music founder at the Royal Conservatory of Music and Dance in the Hague. Raaijmakers put this with a selection of other exciting tapes to inspire the composers working in the lab. In 1967, Michael Waisvisz worked there, and he made a copy of the tape. Waisvisz gave me a copy in the 90s.

[iv] To see the entire score online, please go to:  
[https://www.jackox.net/pages/Ursonate/handscore\\_Indx.html](https://www.jackox.net/pages/Ursonate/handscore_Indx.html)

[v] To view all of the themes in both my original pencil drawings and the Xerox prints on mylar, which are traced with technical pens on acetate over the drawing, you can go to:  
<https://www.jackox.net/pages/Ursonate/urThIndex.html>

[vi] The traveling version of the Hanover Merzbau was brought to the Muzeum Sztuki in Lodz, Poland (2004) when the German Ministry of Foreign Affairs sponsored two concurrent exhibitions: Kurt Schwitters from the collection of the Sprengel Museum and my visualization of the Ursonate. You can download the catalog from Academia.edu at:  
[https://www.academia.edu/24810439/Jack\\_Ox\\_Ursonate\\_Kurta\\_Schwittersa\\_Obra\\_zowanie\\_Muzyki](https://www.academia.edu/24810439/Jack_Ox_Ursonate_Kurta_Schwittersa_Obra_zowanie_Muzyki)

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