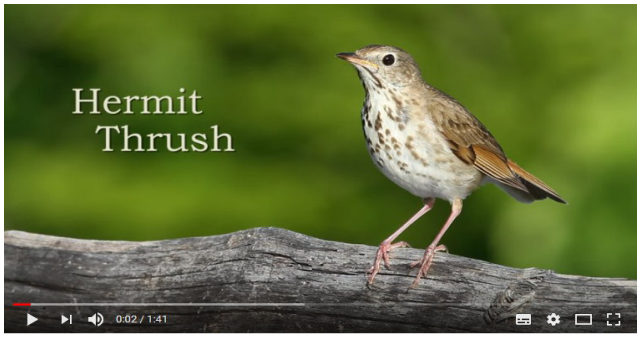
The Singing of the Hermit Thrush – the Melody in Chirping

(shortened version in English, translation with translation.google with own corrections)

About the Hermit Thrush:
The following video of „Hermit Thrush“, on which the hermit thrush with 7 different verses can be heard, gives a good impression of this bird, which is unknown in our soundscape. Each verse begins with a somewhat longer tone followed by a quick (for our ears!) noisy chirping above the frequency of the introductory tone, the pitch of which can be between 1800 and 4600 Hz. On the video it is also nice to see how the hermit thrush turns its head between its verses to hear whether another "hermit" might answer it with its own verse.



https://youtu.be/o0mATRdzZSc

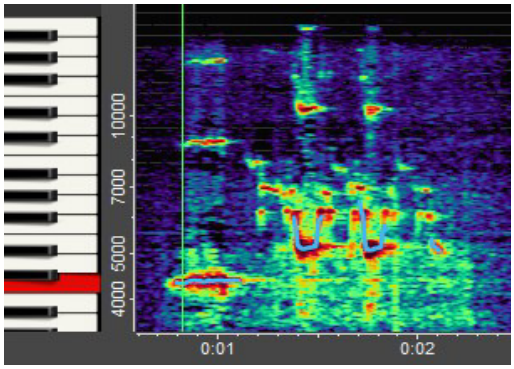
The Hungarian biologist and musicologist *Peter Szöke* discovered in the 60s of the last century a possibility to make audible by octave transposing what is hidden in the birds' chirping song for our hearing ability. He called it: **"The true Music of Birds"**. He recorded the songs of a wide variety of birds with an analogue tape recorder and then played the singing of a bird slowed down, 2x / 4x / 8x / 16x. (part 1 https://youtu.be/o-l7_olNr0k , part 2 https://youtu.be/xnfPUlR3ccg)
Through the octave transposition downwards, nothing changes in the structure, in the vertical stratification and distribution of the frequencies as well as in the temporal and dynamic proportions within the sound and / or noise. But what changes more and more, the deeper and slower the sound noises can be heard, is *what we hear about and in it and how we hear it*. We hear more and more in every deeper dimension - more sound, more timbres, more spectrum, more variety, more clarity. And the most astonishing thing is: From the original noise, sound and chirping, 4 octaves lower in some birds singing clear interval sequences sound out and literally sounding melodies unfold.

In the original position at 4000 Hz, you can only hear a thin noisy chirp that sounds an octave down more like a trilling, 2 octaves down you mean to hear a quick chirp on a small flute and you can already hear a few individual notes. 3 octaves below you don't know exactly whether someone is playing a flute, is calling or even singing. And then: 4 octaves lower, at a slow tempo and human familiar listening area, an unexpected and unheard of great melody unfolds, the sound and character of which can be literally enchanted.
Peter Szöke then did the following experiment to check the transposition: he sang the melody on tape and then accelerated it step by step in octaves, and "look there" or "hear, hear": the 4th octave is the same again to hear the noisy chirping of the hermit thrush as in the original. In the end the melody disappeared again in the chirping of the hermit thrush.

The singing of the Hermit Thrush - from chirping through 4 octaves to melody

Here you can listen to the recording of this verse of hermit thrush with several repetitions of Peter Szöke's record "The true Music of Birds":

„1 Hermit-Thrush-1 C8.mp3“



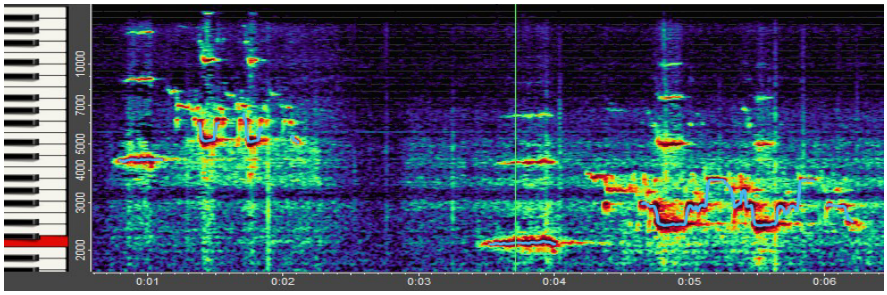
original position C8: 4000 – 7000 Hz

What *do* we hear or what *can* we hear when we hear the chirping of the hermit thrush?

At first spontaneous listening nobody will define these strange noises as singing of a songbird. And if I didn't know that a bird was "singing", I would describe these noises in the repetition more as an intense short squeak of metal, followed by a fine scraping movement sound. This is how I imagine the sound of the "Wetterfahne“ (weather flag) from Schubert's "Winterreise“ with which the wind plays on the roof of the beloved girl's house and which "the singer" thought in his delusion that it is „whistling out“ (booing out) the poor refugee.
What I hear from the hermit thrush is far from the diverse melodies that can be heard at a black-bird at the beginning of every verse. And even in comparison to the chirping song of a chaffinch or the „Tirilieren“ (trilling) of a lark, the chirping of the hermit thrush seems very noisy to me. Obviously, it lies clearly in a frequency range in which my hearing ability can no longer differentiate very much in terms of pitches or sound sequences and can no longer differentiate well between what really sounds and what sounds noisy. It is for our ears a border area in which hearing more changes into a perceptual feeling that can trigger an intense and exciting stimulus in our ears.

The chirping of the Hermit Thrush slowed down twice - 1 octave lower

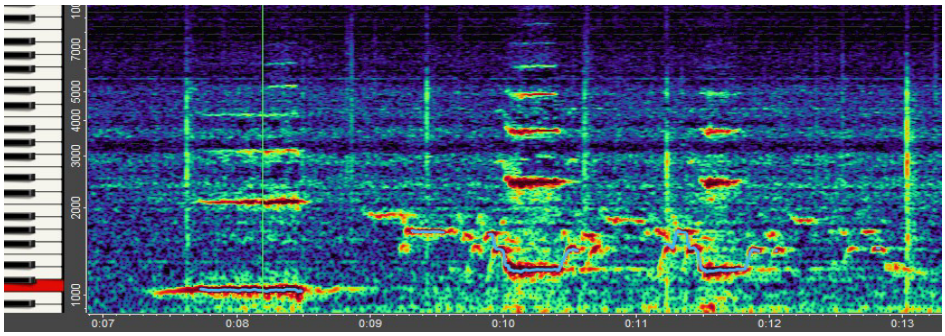
„2 Hermit-Thrush-1 C7.mp3“



C8 C7: 2000 – 3500 Hz (2 x langsamer)

The range between 2000 and 4000 Hz is the range in which the human ear has the lowest hearing threshold, where we can also perceive sounds with low sonic pressure or where our ear is very receptive and sensitive to hearing impressions. The sounds of the hermit thrush can no longer be heard in this frequency range as a rather noisy chirping, but they sound more like a trilling, in which certain pitch movements can be perceived, but which are so fast for our ears that we cannot hear them distinguished clearly. But the first longer tone (C7 at 2125 Hz) can be whistled with the lips directly on the same frequency. It also sounds like a whistle at the hermit thrush, and in the chirping you might think you could hear the sounds of a very high short flute, with a noisy, airy sound that is played so quickly in seemingly arbitrary tones that our ear, due to the high frequency in the sequence of the tones and because of the high frequency range of the vibrations it is not possible to clearly differentiate between the noisy and the sound or only has a clue that something could be heard.

4x slowed down – 2 octaves lower – „3 Hermit-Thrush-1 C6*.mp3“*



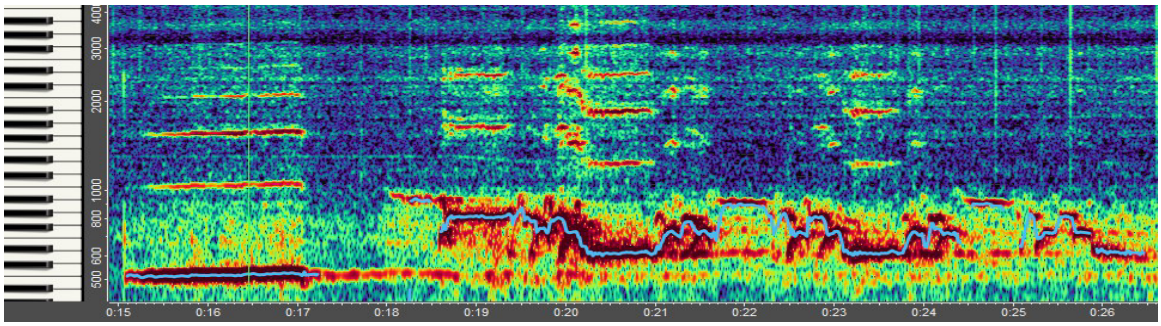
C6: 1000 – 2000 Hz

At this tempo and in this position (1000 - 2000 Hz), in addition to the long tone at the beginning (C6), the main tones of the melody can be heard quite clearly (E-flat6, G-flat6, A-flat6, B-flat6) and it is relatively easy to whistle or re-whistle the tone sequence with its main tones in this frequency range. (Men and women can whistling in the range of 1000 to 3000 Hz.)
Since the E-flat6 sounds longer, partial tones up to the 5th partial, the third, can be seen on the spectrogram of the hermit thrush, which can also be heard in the more pronounced timbre.
If you hear the first note, the C6, again and again, it sounds like a blowed-on (?) tone of a flute, for example from a reed flute. Did our early ancestors elicit their first tones from reeds or bamboo pipes or hollowed-out bones?

Loop C6 - „3a Hermit Thrush-1 – loop C6.mp3“

And the fast, lively flute tones that followed the first longer-blown tone: Did they occur when holes had been drilled in the pipes at a certain distance and then someone playfully and accidentally opened and closed the holes with his fingers? (With pentatonic tone sequences, it always sounds somehow sonorous and stimulating, no matter which tone sequence you play. Listen to the „audio example 8“ with the bone flute page 5, a replica of the famous 40.000-year-old bone flute made from the bone of a swan.)

8x slowed down – 3 octaves lower – *„4 Hermit-Thrush-1 C5.mp3“*



C5 – 500 – 1000 Hz

Now it can be heard in the melody that the faster intermediate tones are formed from the same pitches (E-flat, G-flat, A-flat, B-flat) as the main notes. The first long tone now has no noise from the frequency range, it is a full sound. If you only listen to the first longer sound several times behind each other (see “Loop C5” in the audio file below), you cannot say at all whether it is a kind of natural sound (in any case it is not synthesized), whether it is the sound of a mysterious flute-like instrument that has never been heard before, whether an animal “sings” in any way, or whether this strangely touching sound may be produced by a human voice. Is there a woman or a man singing (in head voice)? The sound sounds un-"formed", immediate, "natural", you do not see how it is produced. Is it more like calling or singing, a sounding sound (in German „klingender Laut“ *) that lasts on one frequency, vibrates and has some vibrato? Perhaps our ancestors shutes something each other, kept in contact with each other over long distances, communicated without the sound

meaning either or that? Or could such a sound have no defined meaning, but could express a meaningful feeling, reflect a state of mind, convey an attitude?

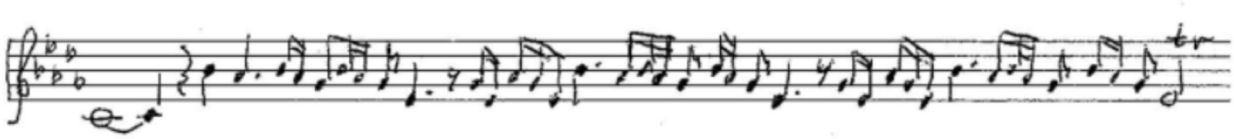
*) The German „Laut“ can be a sound, a noise or a mixture of sound and noise, e.g. a warning sound or the sounds of young birds in the nest. A „Klang“ (sound) with its uniform proportional vibrations is the opposite of "Geräusch" (noise) with its irregular or chaotic vibrations. In German, „Gesang und Klang“ (song and sound) rhymes as well as „singen und klingen“ (singing and sounding).

Loop C5 - *„4a Hermit-Thrush-1 – loop C5.mp3“*

When it comes to the sound after the long tone, you do not know exactly whether it is still chirping or already singing or even a melody. (The E-flat is a full sound with a spectrum up to the 8th partial, i.e. over three octaves.) The longer sounding notes B-flat, A-flat and E-flat have almost something of a signal effect in this version and the repetition creates a kind of echo space between Fifth (B-flat/E-flat) and Fifth (A-flat/E-flat), in which the faster nuances resound in the distance like sound swirls. One might also think it was a song with ornamentations that someone improvised between the main notes.
This chirping song reminds me of the songs of pygmies (the „bushmen“) that I heard a long time ago. As far as I remember, they also have something yodelling in their singing and communicate with each other through such chants in the bush when they cannot see but can hear. As I heard in a documentary, everyone can tell from the singing where and at what distance everyone is, everyone can orient themselves in the thicket and several people can exchange about the type of singing, what everyone is seeing and what he is doing or intending to do. They see with their ears !

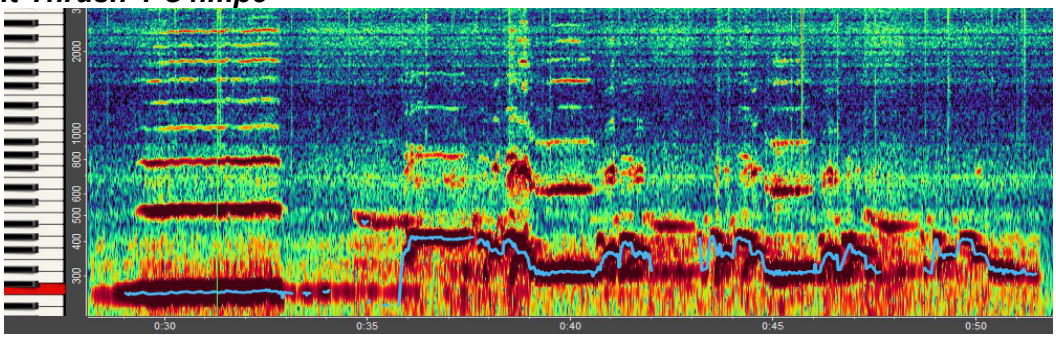
If I loop this passage over and over again, the sounds can act like a trance induction.

16x slowed down – 4 octaves lower – The great melody



"A song sleeps in all things that dream there on and on and the world begins to sing, you just find the magic word:" *- Schläft ein Lied in allen Dingen / die da träumen fort und fort / und die Welt hebt an zu singen / triffst du nur das Zauberwort.* (Eichendorff)

„5 Hermit-Thrush-1 C4.mp3“



C4 – 250 – 500 Hz

Who wouldn't be touched by this deep singing of the hermit thrush, a truly unheard of sound? The first long swell sound alone : from which rooms, what depths does it penetrate our ears, what dimensions does it measure or did it measure when it penetrates our listening area, does it actually nest in my ears? The less I can name or define this sound, the more it touches me in a mysterious way. It seems strange to me as from distant, unreachable worlds and at the same time it comes close to me as if it might sound familiar to me.
And the melody, how it sounds so softly and intensely through the room opened by the big swell,

is a bit sluggish and yet smoothly moved. Does it come from the "song that sleeps in all things"? The four tones of the melody sound in the sequence of notes almost as if by accident and at the same time seem like hypnotic to one to follow "Ariadne thread" through our cochlea (German „Hörschnecke“ - hear slug), as if they were inaudible to our ears, have always been here and there as elements of an atmospheric spectrum of sounds and noises, from which they now appear when listening to the melody and come up against the resonance of the auditory cells (*ciliae* – German „Sinneshaarzellen“ - sensory hair cells) that vibrate in vibrating preparedness.
When I hear something comes to live in me, there is a trembling excitement, as well as the longer-sounding tones, the A-flat and the E-flat, start to quake slightly the first time and start trembling the second and third time.

Finally, for comparison, the chirping of the hermit thrush four times in the original position at 4000 Hz (C8) and then once 4 octaves lower the great melody at C4:

„Chirping and Melody“ - *„6 Hermit-Thrush-1 chirping and melody.mp3“*

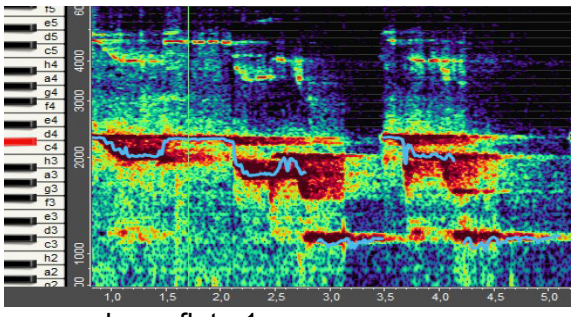
The whole recording from the hermit thrush from the record „The true Music of Birds“ - C8/C7/C6/C5/C4/C3 - „6a Hermit Thrush-1 record The-true-Music-of-Birds.mp3“
For the deep version C3 you need good headphones or external speakers.

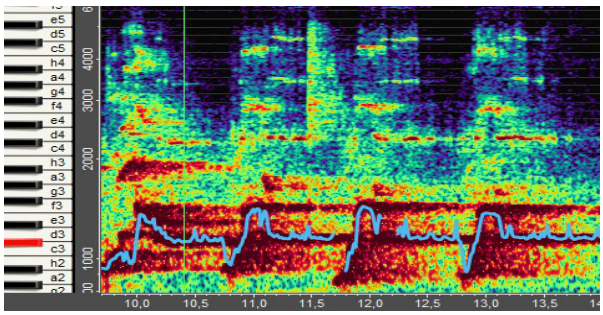
CD „Welthören“ - World Listening - „7 Hermit-Thrush-1 World Listening.mp3“

Here is the recording from Peter Szöke's bioacoustic studio on the CD “Welthören” (World Listening) (1990) and the text:
„In May at the bioacoustic institute in Budapest, Dr. Szöke recorded the sound of a hermit thrush on his acoustic microscope - a slow-motion machine for acoustic processes.“
„The voice of the hermit thrush as we hear it."
„Then he switches the voice 2 times, 4 times, 8 times and finally 16 times slowed down:
An unexpected melody has emerged from the chirping."
Dr. Szöke sings the melody on his tape recorder and accelerates he then accelerates the counter sample back to the initial speed of his experiment beschleunigt dann die Aufnahme als Gegenprobe auf die Anfangsgeschwindigkeit seines Experiments zurück.
2/4/8/16 times faster:
"The melody has disappeared again into the chirping of the hermit thrush.Dr. Szöke says:
In the songs of the birds, 200 tones often follow each other in a second, a speed that our ears can no longer decipher as a melody.
What an experience! We only hear from the world what our ears can tell us. Hear what can be heard! " - Höre was zu hören ist!

The sound of a bone flute - „8 Bone Flute.mp3“

The so-called "Geißenklösterle flute", the world's oldest found musical instrument found in a cave in Swabia, is a bone flute made from a swan's spokes. It is 35-40.000 years old. The holes are designed so that a pentatonic melody can be played on them.


bone flute 1


bone flute 2

My first encounter with the singing of the hermit thrush and the melody in the chirping

I heard this sound for the first time in the 90s, on the CD “World Listening”, on which the most varied sounds from nature and cultures from different regions of the world had been collected. Back then I was completely fascinated by this strange sound and by the possibility of listening to the twittering of the birds.
About 10 years ago I heard a duet for violin and viola by Zoltan Kodaly in a concert. I had never heard the piece before, but when I heard a passage from the viola I suddenly felt as if I knew the sound, the color and the melody from somewhere. And immediately the melody of the hermit thrush appeared in my inner ear, which I had not heard for almost thirty years. Was it an acoustic hallucination? Or had the singing of the hermit thrush in its whole character so deeply made an impression that I could still remember it? Or did I hear both the chirping and the melody of the hermit thrush in the deep sonorous sounds of the viola and and the bright whirring sounds of the violin? Or did the composition and the pure sound of the instruments reveal something like an archetypal sound memory? Hadn't Kodaly used folk music elements and, speculatively, did the early shepherds and farmers perhaps listen to the birds' melodies and flute sounds?

I wrote this text in 2018. It was my first analysis of bird song in the octave slowdown.
I will publish the complete version on a new website "The Sound Cosmos of Birdsong", which is still under construction.
In addition to the text, there will also be the following topics in an appendix with additional spectrograms and audio files:
- Pentatonic in the song of the hermit thrush
- The melody sung by a baritone (from the record by Peter Szöke)
- The melody of the hermit thrush whistled (by J.Q.) and sung (hermit thrush)
- The birdsong and the sung melody (by Peter Szöke) in comparison
- The melody played on the piano in different versions