EXPERIMENTS
WITH
MUSIC OF THE PLANTS
DEVICE

LOGBOOK

Music of the Plants and Water

EXPERIMENTS WITH MUSIC OF THE PLANTS AND WATER

Contents

1 Summary

1.1 Introduction

This logbook documents experiments and experiences with "The Music of the Plant Device" (MOTP) from Devodama, Damanhur, Italy. The time period covered is the years from 2015 - 2021.

"The Music of the Plant Device" transforms small changes in the electrical resistance in a Plant (or other objects) into sounds in real time.

The MOPT device functions only with a sample having a resistance in the interval 50 kΩ to 40 MΩ. This excludes dry wood, dry stones and crystals like rock crystals.

On the other hand wet samples as well as small plants with a resistance below 50 kΩ could in most cases only produce music if an appropriate resistor was placed in series with the plant/sample.

The experiments with resistors separately, showed that the variation was less that the variation in plants and water, and therefore a greater part of the “music” must be attributed to the plant or to the water.

1.2 Experiments with plants

We soon discovered, that the plants did not always play when we would like them to play. A plant could be playing at one time - and later on the same day, it didn’t play right away when we wanted to share the music with some friends.

The experiments show in their entirety that plants react to the presence and activities of humans as well as the presence of other plants. It is not a one way communication, plants offer something to the environment as well as they reacts to the environment.

Videos can be found on our you-tube channel for plant music:
https://www.youtube.com/channel/UCItx0iH3GcwtuFZBi3Ps5XQ/videos

1.3 Experiments with water

Experiments with water includes music with the MOTP device and resistance measurements with the eSenseSkinResponse app on an iPhone.

The experiments seem to indicate that water reacts to the environment and is sensitive to visible light.

Playing with melting ice reflects how the resistance changes from the solid to the liquid phase of water.

Recordings with water treated in various ways with colored filters, labels and recording during a super full moon, still needs an interpretation.

Videos with water music can be found on our you-tube channel for experiments with water:
https://www.youtube.com/channel/UCgg1Ek3XSGiOrgPSe0htuvw

1.4 Experiments with crystals and stones

Dry stones and crystal have too high resistance to produce music via the MOTP device.

But marble which had been stored in water for 3 days was able to produce music via the MOPT device.

Topsoil with a small water content also played fine.

1.5 Artistic experiments

Using a photo resistor open the possibility to translate changes in the present light to sounds. Recordings of a sunset or a candle light or a crystal lamp are possible and interesting but difficult to interpret.

2 2015

2.1 First try [12-01-2015]

Received the Music of the Plants device (U1) from Damanhur, Italy. Our first try was with the plants Orchid, Kamelia and Hibiscus, all potted plants in the house. The kamelia did not play that day - but a few days later it also played.

Turned on the device and tried to play with both electrodes on the table the devise did not play.

Played with a potted plant and moved the ground electrode onto the table. The music continued (for a while?)

2.2 Ficus Benjamina Danielle [14-01-2015]

Played with a potted Weeping fig.

2.3 Kamelia, Orchid, Removing electrodes [24-01-2015]

Played with Kamelia + Orchid in sunshine. Removing both electrodes - playing continues for 30 s. The switch off. By restart no music.

2.4 Resistance measurements [27-01-2015]

Digital resistance measurements in potted plant: Earth to earth 25 kΩ, earth to leaf 2 MΩ.

Figure 1: The electrode settings earth/earth and earth/leaf in section 2.4

2.5 Resistance/voltage measurements in body [29-01-2015]

A digital multimeter is used to measure 4 items

1. Hand to hand resistance in human body (= 10 MΩ)
2. AC voltage hand to foot 0.200 V
3. AC voltage on the kitchen table not touching the electrodes 0.062 V
4. AC voltage on the floor, one electrode touched one foot: 0.134 V
5. AC voltage in air on the floor not touching any electrodes: 0.035 V
6. AC voltage on the floor,the two test electrodes each covered by a human foot: 0.159 V
7. AC voltage on the floor, the two test electrodes on the floor not touched by any body parts: 0.021V/0.016V/0.016 V

2.6 Choice of instruments [29-01-2015]

Instruments no. 51-93(Pad3)-98(Effects2)

2.7 Kalanchoe versus hibiscus plants [19-04-2015]

Two kalanchoe plants did not play even after 5 min. Two red LED's light turned on at the front of the U1 device.

A hibiscus plant played at once and without pauses, played both dark and linght notes.

When I took off both electrodes at the same time, the music stopped after a while.

2.8 Playing with plants for two visitors [14-05-2015]

Played with a potted plant for two visitors.

During the playing, the plant aura was seen (with aura-vision) to have yellow/orange spikes outward and green arc's of light.

The session was an uplifting experience and resulted in a cleansing of the atmosphere in the room, felt by all.

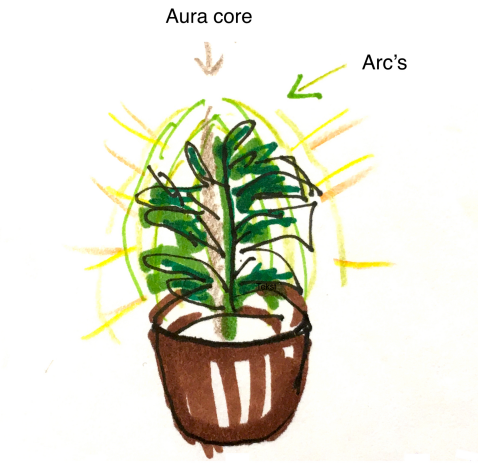

Figure 2: Green arc's of light while a plant is playing, see section 2.8

2.9 Outdoors: a tree and Mentha Spicata [22-07-2015]

Played outdoors near the house with a tree and a plant (Mentha Spicata).

2.10 Weeping fig and singing bowls [08-08-2015]

Weeping fig (indoors):

1. Before and after the sounding of the singing bowls, the weeping fig played deep notes.
2. When we played deep singing bowl sound the plant stopped playing.
3. When we played high pitch singing bowls, the plant played high pitch notes.

2.11 Weeping fig played many hours [07-09-2015]

Weeping fig (indoors):

Played $\sim$ 4 hours [El-piano 2] afternoon between 12-16, stopped by itself.

2.12 New plants will not play [28-09-2015]

New potted plants will not play.

2.13 Orchid, "Desert plant" and hibiscus [30-09-2015]

Afternoon 4 - 5 pm: With two visitors: Orchid and"desert plant" will not play but hibiscus plays.

Later at 8 pm when the visitors had left the house: Orchid plays!

At 9 pm: "desert plant" still did not play. Hibiscus played via "score cloud" software with instrument flute sounds like a modern composer had written the music.

2.14 New potted plant will not play [18-11-2015]

New potted plan could not play even after several attempts with electrodes in different positions.

2.15 New potted plant will not play [21-11-2015]

Two succulents and an orchid could not play late in the evening at 23:29 pm.

2.16 Succulents at noon and evening [22-11-2015]

An unknown succulent could not play at noon 12:00 am.

Later in the evening the succulent played on a table. Recorded at Roland recorder. The instrument was shifted from el. piano 2 to pan flute/flute and the plant stopped playing.

Conclusion: Do not shift instrument when the plant just has started playing!

2.17 Singing bowls and plants playing [13-12-2015]

1. First we played our singing bowls including the large deep one, with plants present but the plants were not playing.
2. Then the weeping fig played 74 flute I would change instrument and the plant stopped playing.
3. Hibiscus plant played electric piano 2, but when we started to play the singing bowls it stopped after a while.
4. We tried the weeping fig once more on instrument piano 2, this time it played.

3 2016

3.1 Cut off branch from a "money tree" [11-01-2016]

We cut a branch from a "money tree" (plant). Electrodes place in front and back end. Played first deep notes, later high pitch notes. (recorded at Roland and via MIDI out to laptop, garage band).

3.2 Dry bamboo stick [11-01-2016]

A dry bamboo stick $5 \times 50 \times 1$ mm. No sound, waited for 3 min.

3.3 Orchid and Hibiscus played with guests [06-02-2016]

Orchid and Hibiscus played with guests, both played deeper and more "relaxed' or calm than usual.

3.4 Norway Spruce in the garden [16-02-2016]

Played with a Norway Spruce tree (common) outside. Calm deep notes. Ground electrode 20 - 30 cm from the tree. The green (signal) electrode ca 50 cm above the ground in the green.

3.5 Meditation with a Weeping Fig [03-03-2016]

Played with weeping fig indoors. It played alone for e few minutes and then we meditate with the plant. Sitting in configuration with two persons

and the plant in each corner of a regular triangle.

After some time the plant stopped - first with long pauses (instrument: el piano 2), the plant stops completely. We started our CD player to play glass-harmonium music. The plant did not start to play. We then moved the electrode to another leaf, this time the plant played again. The plant continued to play while our CD player played glass-harmonium music. The plant played in an dark room (so trees do not sleep in the dark??).

3.6 Orchid and Money Tree indoors [12-03-2016]

10 p.m. Indoors. Electric light. The orchid played at once with calm "melody" . Money tree in the same room did not play. Energy seen with orchid: curved green strings of energy near the leaves not near the flowers.

Figure 3: Curved green strings of energy near the leaves in section 3.6

3.7 Snowdrop and Winter Arconite outdoors [14-03-2016]

Played with snowdrop outside (battery powered U1 device) It played fine at once.

Tried with winter arconite, but it would not play (we waited for 2-3 min).

3.8 Weeping fig upstairs [18-03-2016]

We play with the Weeping Fig upstairs at 7-7:30 pm. Changed the chorus and re-verb settings to the minimum, the plant still plays.

Fetch a Roland recorder with the intent of analyzing the sound in the score cloud software - and the plant stops playing. I shift the electrode to another leaf and leave the room with the Roland recorder, the plant starts again!

Later I left the room and went downstairs, the plant stops playing after a while, when I go back and shift the electrode to a new leaf, the plant plays again

3.9 Cactus afternoon/evening [02-04-2016]

Cactus in the afternoon with open orange flowers, played deep notes. Late in the evening same cactus with closed flowers played first deep notes then later high notes.

The plant was not moved, only the green electrode was disconnected and reconnected from afternoon to evening.

3.10 Succulent [02-04-2016]

Tried succulent without moving it. It does not play during 3 min period.

3.11 Cactus and succulent [04-04-2016]

During a visit at home we played with cactus (orange flowers). Tried with succulent, it did not play.

3.12 Pine and Maple (Acer) near Dolmens [12-05-2016]

Placed the black ground electrode 25 cm from the steam of the Pine tree and the green signal electrode on a branch to the right. It did not play , we moved the black electrode to 30-40 cm distance from the steam, and we moved the green electrode to a branch on the left side of the tree. It played somewhat staccato dry notes.

Moved both electrodes to a nearby Maple (Acer) tree, it played different

(the instrument was Acc. Bas).

Then we moved only one electrode (the green) back to the pine, while the ground electrode remained near the Maple (Acer). The pine played again in "Pine-wise" way.

3.13 Cactus and a human little Finger [19-05-2016]

Played with cactus and then with a human little finger on the left hand.

The green electrode was placed at the root of the finger. The little finger and the thump pressed the steel nail (normally used as ground) in between them. The black crocodile clip was placed on the end of the steel nail. Played at once. See fig 4.

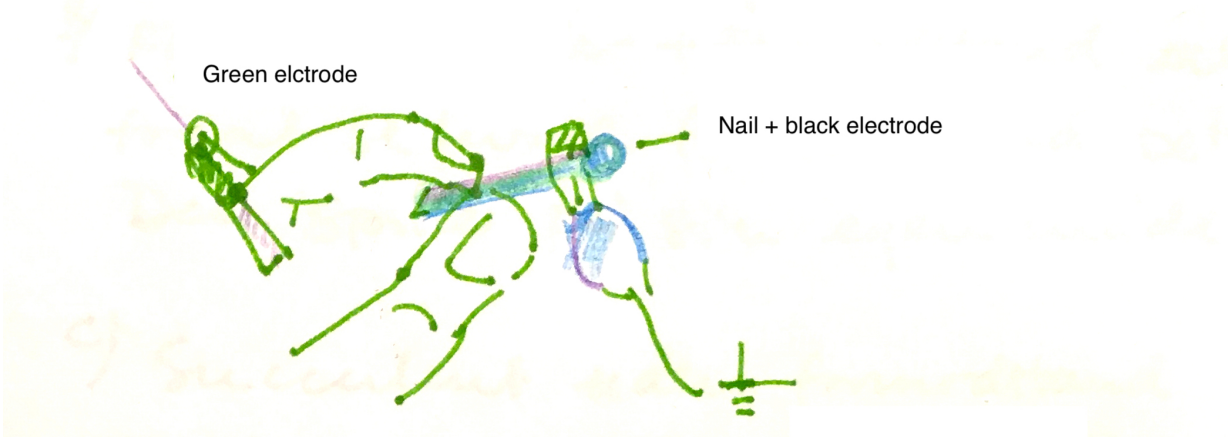

Figure 4: Little finger with electrodes. See section 3.13

3.14 Many plants in a Flower shop [21-05-2016]

We played with a number of different plants in a flower-shop in Copenhagen. People were allowed to experiment and to come forward with suggestions which resulted in a playful atmosphere.

We observed:

A. When new people came in through the door, the actually playing plant paused for $\frac{1}{2}$ - 1 min. and then resumed the playing.

B. When a chili plant was placed next to a tall (ca 50 cm) cactus, the cactus played differently. The observation could be repeated!

C. The first plant selected for playing was a little (eco) banana tree. At first it would not play, but later after other plants had played, it was tried again and this time sounded well.

D. A plant stopped playing when stones was placed beside the pot.

E. It was an uplifting experience and people stayed for the event longer than expected.

3.15 Crystal and cactus [30-05-2016]

Recording cactus via the MIDI out port. The unknown plant will not play.

Played with a rock crystal soaked in water. White metal wire at the top, copper at the bottom. It played about 90 sec. and then stopped (because it went dry?).

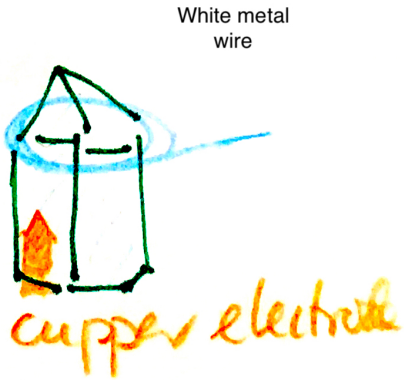

Figure 5: Crystal with electrodes. See section 3.15

3.16 Cactus and succulent repeated [02-06-2016]

A. Succulent + resistor in series with the green electrode (the resistor was labeled: 1.2 MΩ measured: 1.16 MΩ). The plant plays calm and slow. Compare with section 3.11.

B. Moved the electrodes and the resistor to the cactus plant (section 3.11) and the cactus played in the same way as the cactus before.

C. Moved the electrodes without the resistor back to the succulent, it did not play.

3.17 Water [02-06-2016-2]

Water in a glass bowl 20×11×6.5 cm and a 1.2 MΩ resistor in series with the green electrode plays calmly. The resistance in the water between the electrodes was measure to 0.2 MΩ. See figure 6.

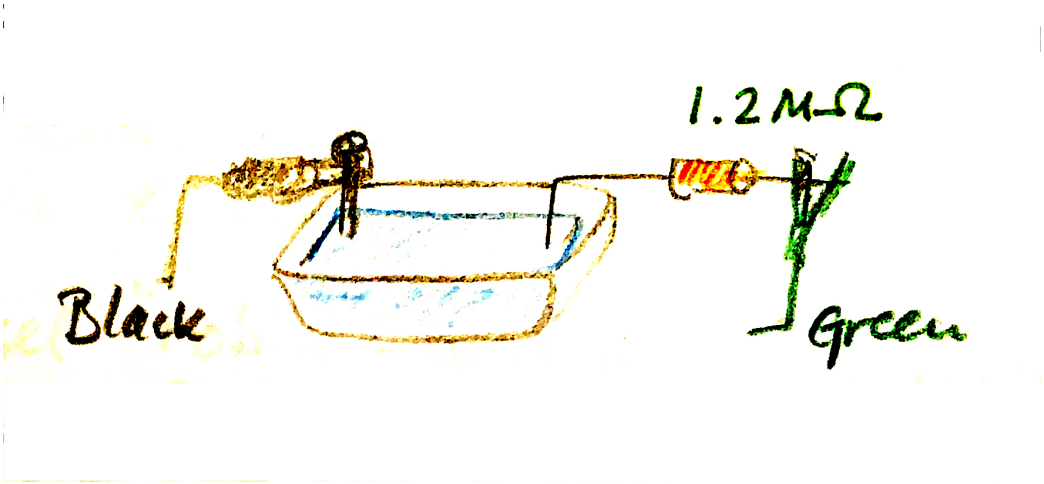

Figure 6: Water with electrodes. See section 3.17

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3.18 Stone [02-06-2016-3]

Porhyry with water, does not play. Porhyry without water, does not play.

3.19 Stones in Water, and potted succulent [22-06-2016]

Tap water and blessed water in a glass bowl see fig. 6, page 19. Placing stones in the water resulted in a little more powerful playing. We used the following stones: Rose-Quartz, a stone from Assisi, a porphyry.

The succulent played in series, so that each series finished with the same three final notes before it was followed by a short pause.

3.20 Changing instruments [08-07-2016]

Recording cactus in Macbook - ipad with Garageband software.

Later without PC and Garageband: Changing instrument on "The Music of the Plants Device". When the instrument is "Organ" instead of "Electric piano 2" the pauses turns into long continuous notes.

Later without PC/Ipad: Shift from Elpiano2 to Church Organ: Lively piano music translates to lively organ music, as if the plant now is in a lively mood.

3.21 Cactus with resistor [13-07-2016]

Playing with a cactus (indoors) and shifting the connection (black electrode) from the normal grounding nail to an 1.2 MΩ resistor. The shift does not result in any major change in the pitch of the music. The chosen instrument was el-piano 2. Neither does the shifting back to the nail from the resistor result in any major change of the pitch of the music.

Hypothesis: The total resistance in the circuit does not matter (much) only the variations matters.

Figure 7: Pot with soil and grounding nail/resistor. See section 3.21

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3.22 Cactus, water, air and paper [17-07-2016]

1. Cactus: Playing with a Cactus, elpiano 2, the music keep pauses while the green LED is still turned "on" at the front of the device. Playing with instrument church organ no pauses heard, but notes are shifting while the green LED is unchanged "on".
2. Water: Circulated water plays with long pauses $\sim$ 10 sec.
3. Air + no plant + 1.2 MΩ resistor: no music/sound.
4. Paper + no plant + 1.2 MΩ resistor: no music/sound.
5. Played with seawater collected at "Høve strand"
6. Played with surface water let out in the sea at "Høve strand".

Question: What influence do we have as humans on the music from plants and water, just from our presence?

3.23 Resistence in water samples [21-07-2016]

Measured the electrical resistance in different types of water in a plastic sample box:

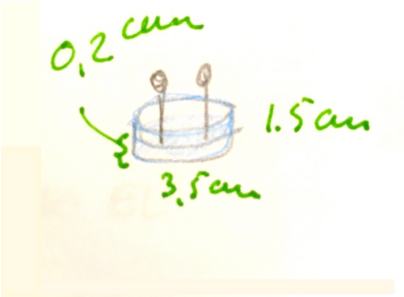

Figure 8: Plastic box with two electrodes. See section 3.23

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Sea-water	Fresh-water	Tap-water
0.1 MΩ	2.5 MΩ	1.5 MΩ

Table 1: Resistance in different water samples.

3.24 Water collected from "Mølleåen" [24-07-2016]

Collect water form "Mølleåen" 3 PM

3.25 Water from "Mølleåen" [25-07-2016]

Playing with water from "Mølleåen" and tap water as a control.

3.26 Water from "Skanderborg Sø" [26-07-2016]

Playing with water from "Skanderborg Sø", sampled at 7 AM, played at 10:30 PM. Plays calm like other waters.

3.27 Pine, dress rehearsal for a Geopark event [29-07-2016]

Play with a Pine near dolmens and the neighbor tree. Pine plays calm.

3.28 Pine, Geopark Event I [30-07-2016]

The first Geopark Event took place near dolmens in Odsherred, 11-12 A.M. 35 people came to listen to a pine tree playing, and at the same time a running route passed nearby with runners popping up with a few minutes intervals.

In the beginning the pine-tree did not play. The nearby maple tree would not play. A nearby wild rose (bush) also didn't play. A potted tree a kind of citrus/orange tree played..

When some of the audience had left (have given up?) and the running event passing by had stopped the pine started and played more freely.

Was is important that some (including the skeptical) had left? Was it of importance, that the running event had come to an end? Did the citrus tree provide an opening in the atmosphere by meeting the expectations of the audience, so that the trees could play more freely?

3.29 Pine, Geopark Event II [31-07-2016]

The second Geopark Event took place near dolmens in Odsherred, 11-12 a.m. The same pine tree as in Geopark Event I. The pine tree played at first only a few notes - people (35-45 in number) arrived and settled down, the atmosphere was relaxed.

Pine tree didn't play, the nearby maple did not play, wild roses did not play and a potted cactus did not play!!

Video recordings of a snowdrop playing lively was shown to the audience, and soon after the cactus started playing!! And at 11:45 the pine tree started playing. lively with no pauses, also wild roses would now play.

When pedestrians came by they stopped, but resumed when they had passed by. The wild roses was chosen by a child (10 years old), who wanted to hear them.

3.30 Cactus, Hi and Low settings [31-07-2016]

The black electrode was nearly broken, and after soldering the black electrode, it was tested by paying with a cactus both on setting "Hi" and setting "Low". The cactus was playing almost the same regardless of the setting.

3.31 Weeping fig, changing music settings [01-08-2016]

While a weeping fig is playing I will change the music setting to full chorus + full reverb [instrument el-piano 2], and the plant stopped playing!! Later when the plant was playing again, reducing the MIDI velocity setting resulted in darker and more soft notes.

3.32 Meditation with a weeping fig [02-08-2016]

We meditate with a weeping fig. The tree stops after ca.1 min.

The instrument is shifted to church organ, and the sound is now long even notes. Shifting the instrument back to el-piano 2 results in normal continuous playing without pauses. [Suggestion: What appears as pauses with el-piano, shows itself as long steady notes with church organ]

3.33 Distilled and de-mineralized water fig [08-08-2016]

Distilled and de-mineralized water in a small glass and a 1,2 MΩ resistor added in series with the green electrode. The two types of water sounded much like the same.

Figure 9: Small glass used to play with two types of water. See section 3.33

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3.34 Rock crystal with dripping water [10-08-2016]

Playing with a rock crystal, dripping water over it. Each time a drop was running down 3 notes were played.

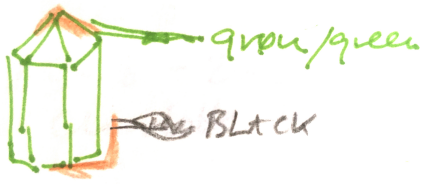

Figure 10: Rock crystal with two copper electrodes. See section 3.34

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3.35 Cactus and air [10-08-2016]

Played with cactus - took both electrodes off - placed the electrodes on the table ca. 5 cm apart from each other. Plying stops at once and only a single note came 5 sec later. Does not play for 1 minute. The device was then turned off.

3.36 Blessed water [17-08-2016]

Water blessed under a crystal light bed. Sounded maybe like tap water??

3.37 Orchid + cactus + hibiscus and visitors [23-08-2016]

A family came to visit us (7-9 p.m.), we served tea and played with Orchid, Cactus and Hibiscus, all played calm.

3.38 Technical note [23-08-2016-2]

The U1 device electrodes 3.5 mm (stereo) jack can be connected to a red/black splitter cable, which tranforms the connection into a mono 3.5 mm jack. See figure 11., page 25.

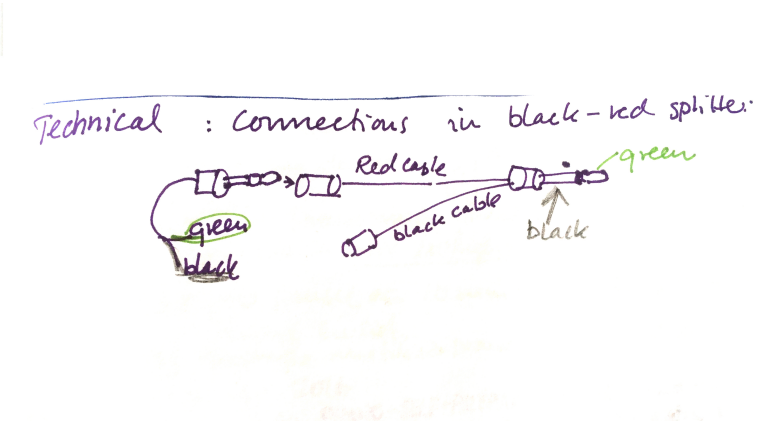

Figure 11: Connections in black - red splitter See section 3.38

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3.39 Water wrapped in colored filters [18-09-2016]

Two clear glass bottles filled with water was wrapped in blue and orange transparent Lee-filters respectively. Left outside on a balcony for 4 days.

Music played with the water wrapped in color filters at 23-09-2016 (1:30 p.m) No big difference!

3.40 Water wrapped in colored filters [18-09-2016-2]

Two clear glass bottles filled with water was wrapped in blue and orange transparent Lee-filters respectively. Left outside on a balcony for 4 days.

3.41 Prano water and tap water [26-09-2016]

Playing with Prano self (Damanhur) prepared water and ordinary tap water. Played tibetan music to influence the water.

A. Playing with the Prano-self-prepared water and tap water, using the "Arduino Hygrometer" electrode in a small glass. (No extra resistor used).

B. Playing "Tibetan Wind" track 2 quite loud to the "prano - self - prepared" water in order to see what the effect could be on the water sounds.

   Actually the Prano -water music changed to more lively and deeper (low pitch).

C. After a pause (10 min.) both tap water and Prano - water plays more lively.

D. After repeating section B, the Prano - water plays even more lively.

3.42 Sea water and fresh water [26-09-2016-2]

Sea water collected 27-07-2016 and freshwater ("Fredriksberg Have") collected 04-08-2016. No difference was observed, so it seems like water is not getting "old" during one month.

3.43 Resistor alone [05-10-2016]

Playing with a carbon composite resistor 1.2 MΩ, no plant, no water. Played for 30 sec. like water.

3.44 Air, resistors, and chestnut [05-10-2016-2]

Air did not play. Chestnut did not play. Water without extra resistor played (setting Low)

Resistors 10 MΩ and 20 MΩ played like water (setting Low).

A Resistor 1.2 MΩ played with the green led on the front on the U1 device turned on, stable for several minutes.

3.45 Lemon juice [05-10-2016-3]

While playing with water, the addition of two drops of lemon juice made the music stop at once.

3.46 My presence and a resistor [06-10-2016-3]

A carbon composite resistor 1.2 MΩ is playing on at table, when I leave the table 4- 5 meters back into the room, a pause occurs.

When I come back leaning forward over the resistor with one hand (fist) on each side of the resistor it plays a variety of notes again, this could be repeated more than five times. [Filmed on Ipad].

3.47 Graphite in a pencil as electrode [06-10-2016-4]

Water plays (alone) via the Arduino hygrometer electrode. When the green electrode is connected to the Arduino electrode and the black electrode is connected to the water via the graphite in the center of a wood pencil, the water does not play.

3.48 Resistor and finger [07-10-2016]

A 2.2 MΩ carbon film resistor played with low pitch.

A 1.2 MΩ carbon composite resistor played, and by adding my finger to the resistor at the green electrode side, the melody shifted to a higher pitch.

Does the finger act as an antenna?

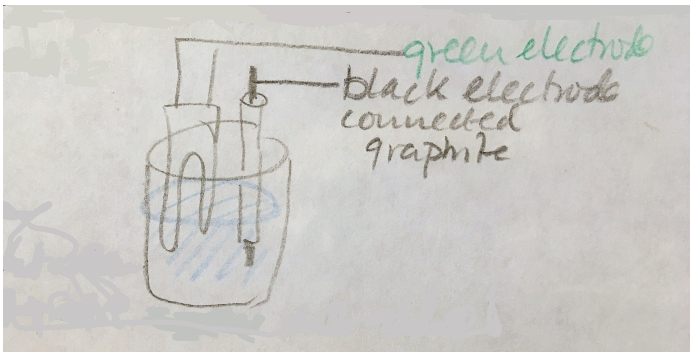

Figure 12: Graphite in a pencil as an electrode in water See section 3.47

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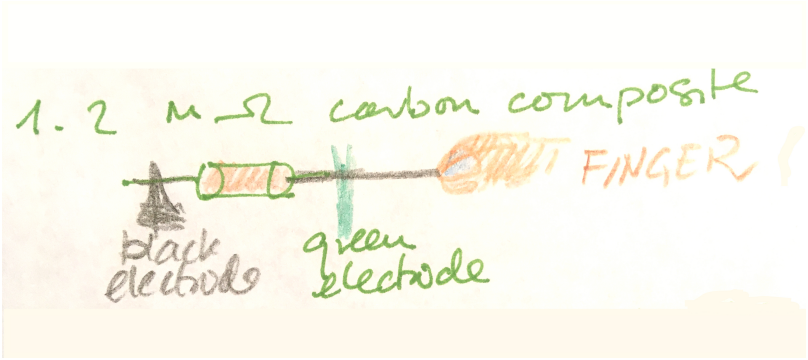

Figure 13: Resistor and finger, See section 3.48

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3.49 Amber [07-10-2016-2]

Amber played with a high pitch at setting (H) high. (No water applied.)

Failed to repeat 4 days later at 11-10-2016, could not play at this date.

3.50 Calcite crystal. [11-10-2016]

A calcite crystal (1.5×1.5×2 cm.) played on setting (H). Weleda toothpaste was used as electrode-gel between each electrode and the crystal.

Played almost like water, but maybe a little more lively.

3.51 Battery powered U1 device. [13-10-2016]

A 1.0 MΩ metal film resistor is connected to a battery powered "Music of the Plants" device, setting [L] and instrument el-piano 2 to test whether the power source has an influence on the music. The music had long pauses more than 180 sec. and the green LED was turned on. Time of the day 13:00-4:00 pm.

Same resistor, this time the Music of the Plants Device was powered with the usual AC transformer After $1\frac{1}{2}$ min the same type of music was heard with long pauses - more than 180 sec as with the battery powered device.

3.52 Tap water and color prepared water [13-10-2016-2]

Time of the day 3:00-4:00 pm.

Tap water played with setting [L] instrument el-piano 2, the first 3 min with pauses shorter than 15 sec. Then 30 sec pause + 2 notes then another 30 sec. pause, then 17 notes. After 5 min played 9 notes in 30 seconds.

Yellow filter and blue filter prepared water see section 3.39 page 25, did not play during 3 min. , the right red LED or Yellow LED was activated.

Later tap water in the same glass, that the yellow filter prepared water had been in, did not play for 3 min. Question: Can the glass transmit some information?

3.53 Repetition of experiment 3.52 [13-10-2016-3]

Time of the day: 6:45 pm. All samples played.

Tap water	Orange water	Blue water	Orange water
High pitch	High pitch	Low pitch	Medium pitch

Difficult to distinguish whether music was different between the samples.

h [cm]	R [MΩ[
5.0	3.30
4.0	2.30
3.0	3.36
2.0	2.40
3.0	2.30
4.0	2.5
5.0	2.35
0	> 20
0.5	19.10
1.5	4.6
2.5	3.7
3.5	2.8
3.0	4.1
2.0	5.7
1.5	8.6 ± 0.9

Table 2: Resistance in water versus height of water.

3.54 Resistance in water versus height 3.54 [14-10-2016]

An "Arduino Hygrometer" electrode was placed in a glass, that was step by step filled with tap water and emptied again, See figure 14, page 31. The resistance (R) in the water between the "legs" of the electrode was measured versus the height (h) of the water in the glass, the numbers seem to indicate some kind of an hysteresis effect, see table 2, page 30.

Extra experiment: Water a 3.0 cm and R was measured to 5 MΩ. Two drops of lemon juice added and R dropped to 0.3 MΩ.

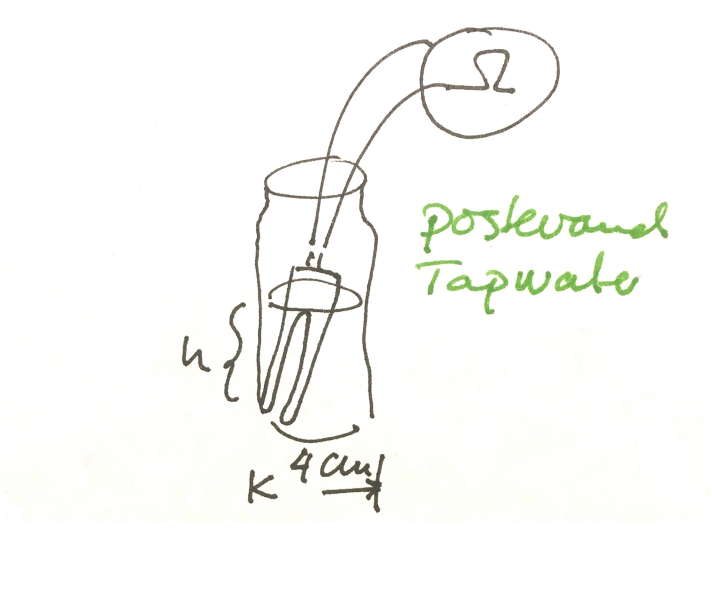

Figure 14: Arduino electrode and water in a glass, See section 3.54

.

3.55 Tree with five trunks [14-10-2016-2]

Played outdoor at 6 pm. with a tree which had five trunks.

Different combinations of connections of the electrodes was applied. The Omron electrodes used in section B and C are" long life pads" who adhere with a gel to surfaces like skin and tree bark.

A. The black alligator clip on a steel nail in the ground, and the green alligator clip on a leaf .

B. The black alligator clip on a steel nail in the ground, and the green alligator clip on an Omron electrode on one of the trunks.

C. The black alligator clip on an Omron electrode on one of the trunks, and the green electrode on another Omron electrode on the same trunk (within $\frac{1}{2}$ meters distance or less).

The music sounded almost the same in setting A, B and C.

3.56 Human leg [14-10-2016-3]

Tried with two Omron electrodes on my left leg. The U1 device did not play.

3.57 Amber [15-10-2016]

Amber would not play until it had been sprayed/douched with water and then dried in a towel without rubbing it.

3.58 Three types of water [16-10-2016]

The three types of water was: Water blessed by expose to a crystal Light bed/Prano selfica blessed water (Damanhur)/Tap Water.

Water blessed in a crystal bed	Water blessed in prano self	Tap water
10 °C	14 °C	23 °C
Most calm	–	–

Table 3: Three types of water and their temperature.

Which role does the temperature of the sample play?

3.59 Resistor shielded/unshielded [16-10-2016-2]

Played with a 1.2 MΩ resistor outside and inside a Mobile Phone Electro-Shield bag.

No mayor difference was heard.

3.60 Lukewarm and cold water [17-10-2016]

11:50 am.

Played with lukewarm water at 23 ° C and with cold water at 9 °C (Blessed water from cystal light bed). Played also with water from "Skanderborg sø" at 23 °C.

3.61 Light sources and photo resistor. [17-10-2016-2]

Played with a light-sensitive photo-resistor ($\sim$ 0.6 MΩ) 2 meters from a candle and 4 meters from a LED torch.

Sound/notes was head.

When turning more light on, the photo-resistor changed to lower Ω values and the left red LED on front of the U1 device lights up and two dark notes was head.

3.62 Frozen resistor [17-10-2016-3]

A 1.2 or 1.0 MΩ resistor was placed in a freezer (-18 ° C). After 10 min the resistor kept pause for more than 7 min.

Taken out again in room temperature again it plays after 10 sec. deep dark notes mixed with middle-tone notes and after a few min. it paused for more than 7 min.

3.63 Light sources and photo resistor 2 [19-10-2016]

A. Played with a light-sensitive photo-resistor behind a telescope pointed towards a candle light. Bad idea, it was unstable, played but the green - yellow -red LEDs on the Music of the Plants device was flickering randomly.

B. Played with a light-sensitive photo-resistor 4 m. from a candle light. The green LED on the music of the plant device was stable, but there was some variation in the audible notes.

C. Played with a light-sensitive photo-resistor 4 m. from a LED torch. The green LED on the music of the plant device was stable, but with some smaller variation in the audible notes compared to section B.

D. With a rock Crystal between the light and the photo-resistor the sound image became more serene.

3.64 Rain water vs blessed water [19-10-2016-2]

Played with rain water and blessed water from crystal - light-bed, the same afternoon. Was there any difference?

3.65 Top soil [22-10-2016]

Top soil collected from the garden in a cylindrical glass 4 cm. in diameter and soil height of 3 cm. Arduino hygrometer electrode, setting [L], instrument el-piano 2.

3.66 Two fingers [22-10-2016-1]

Two fingers placed on two Omron electrodes, setting [H]. Sounds like a plant. When the feeling inside was tense, the pitch was raising (?) .

Figure 15: Two fingers placed on Omron electrodes, See section 3.66

.

3.67 Recording water [25-10-2016]

Recording on iPad (Garage-band) water blessed in crystal light bed and top soil from garden. El-piano 2, setting [H]. Just as 22-10-2016 see section 3.65.

3.68 Spun resistor 6.6 and 1 MΩ [25-10-2016-1]

Played with a spun metal resistor 6.6 MΩ setting [H], el-piano 2. Deep notes heard, long pauses 40-50 sec- then 2-4 notes and again pause > 5 sec.

3.69 Top soil and Hibiscus [26-10-2016]

A. Playing with top soil at setting [H] for 10 min.: The melody repeat itself.

   Watering with ca. 2 ml. of rainwater, the melody changes and it was necessary to shift to setting [L].

   The top soil stopped playing, when one from the family left the house, paused more than 5 min.

B. Hibiscus played via iPad, setting [L], el-piano 2. New kind of melody compared to section A.

3.70 Top soil from Copenhagen and Asnaes [28-10-2016]

Played with top soil collected in central Copenhagen (near the planetarium) and topsoil from Asnæs (little town). 1 MΩ resistor in series.

Top soil from Copenhagen: At setting [H] , gain min., no sound for more than 3 min. 2 red LEDs turned on. At setting [L], gain medium, it played but with long pauses < 1 min.

Top soil from Asnaes: Played at both setting [L] and [H], gain medium green LED turned on, pauses observed: 5, 11, 19, 34 and 19 sec.

3.71 White Marble [28-10-2016-2]

White marbel 12 $\times$ 12 $\times$ 1.5 cm soaked in water for 3 days and then dried with paper towel.

Two copper electrodes on the same side near the edge. se fig 16. page 36. Played calmly. Setting [L], gain medium.

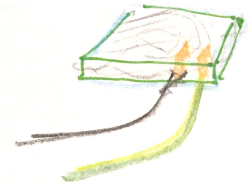

Figure 16: Two copper electrodes and white marble, See section 3.71

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3.72 Marble, alternative electrode setting [29-10-2016]

Marbel plate 12 × 12 × 1.5 cm, prepared as 3.71 but with electrodes across the 1.5 cm edge. See fig 17. The marble played both at setting [L] and [H].

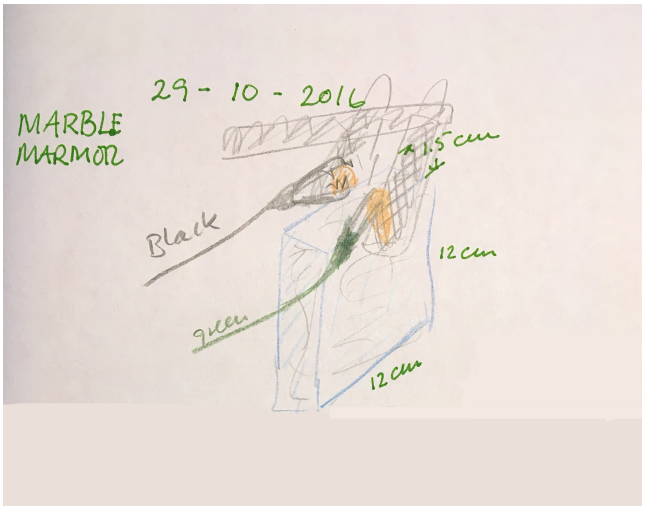

Figure 17: Two copper electrodes and marble plate, see section 3.72

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3.73 Withered maple leaf [29102016-2]

A withered maple leaf (yellow) with one electrode at the top of the leaf, the other at the leaf stalk, playing on setting [H], medium gain.

Figure 18: Withered maple leaf, see section 3.73.

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3.74 Candle light/stroboscopic light [01112016]

In the evening with no daylight, 7 photo-resistors in series were connected to the Music of the Plants device. A candle light was placed a 53 cm distance from the photo-resistors. The total resistance was in the range 350 kΩ to 1 MΩ. Played calm.

The candle light was replaced by a stroboscopic lamp with a frequency of $\sim$ 2 Hz. The stroboscopic light introduced a rhythmic melody but with a beat somewhat slower than 2 Hz more like 0.5 - 1 Hz.

3.75 Two resistors in parallel [03112016]

Played with a 1.2 MΩ resistor alone or in parallel with a 6.6 MΩ resistor. See figure 19. Played with the green LED on (on the front of the U1 device).

When the 6.6 MΩ is connected, the total resistance between the green and black electrode changes from 1.2 MΩ to 1.015 MΩ. The music stopped, except for a single deep note, and the left yellow LED was turned on. Then after a while a new balance was found, the right yellow LED was on, a single high pitch noted was played, and the music started and the green LED was turned on.

The same experiment was repeated with a 20 MΩ resistor instead of the 6.6 MΩ resistor. When the 20 MΩ was connected, the total resistance between the green and black electrode changed from 1.2 MΩ to 1.132 MΩ. (6% change in total resistance). The same sequence of events took place with respect to sounds and LEDs as with the 6.6 MΩ resistor.

This means that in a normal situation, where the plant plays with the green LED on, the variations in the electric resistance of the plant must be less than 6%, otherwise the music would have been interrupted and one of the yellow (or red) LEDs would have been turned on.

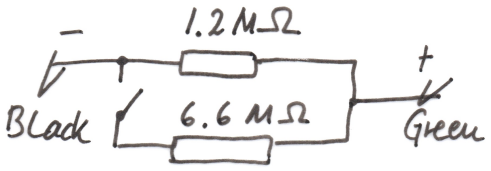

Figure 19: Two resistors in parallel, see section 3.75.

3.76 White, black and green marble [05112016]

Played with white and black marble, setting [H], green marble does not play. Stainless steel electrodes, ca. 1.5 cm apart pressed on to the marble across the plate.

3.77 Rock salt [05112016-2]

Played with rock salt, setting [L], two copper nails as electrodes.

3.78 Candle light and Lee-filters [06112016]

Played with candle light (stearin) and LDR photo-resistor (20-50 MΩ) at 60 cm distance, blue and red Lee-filters between the light and photo-resistors.

Played calm and with green LED turned on.

3.79 LED lamp, candle light and resistors [08112016]

A. In the evening after sunset, played with a photo-resistor (VT33N3) in four intervals each 1 min. Instrument el-piano 2. The notes were counted: an average of 2,25 notes per min. was heard.

Experiment nr.	Duration	Number of notes
1	60 sec.	4
2	60 sec.	2
3	60 sec.	0
4	60 sec.	3

Table 4: Number of notes from a photo-resistor.

B. Then the LED lamp was replaced with a candle light in 60 cm distance from the photo-resistor, setting [L], instrument elpiano 2. Notes counted: An average of ∼40 notes per min.

C. Playing with a 10 MΩ resistor in the dark. Setting [L]. Number of notes: ∼ 1 or 0 notes per min. When I was spoken to it changed to 13 notes per min.

D. A 1 MΩ also played in the dark with a few notes per min.

E. Played with a 1.154 MΩ resistor, the green LED was on. Changing to a 1.167 MΩ resistor resulted in the yellow LED was turned on, and the notes changed to a higher pitch. Changing back to 1.154 MΩ gave more deep pitch notes.

3.80 Melting ice [13112016]

Played with melting snow/ice 47 min., short sections. High pitch in the start but the pitch turns slowly into lower pitch (and longer pauses).

3.81 Water and full moon 14-11-2016, 14:53 [14112016]

Played with water from melted snow from our garden at the time of the super full moon, a special full moon because the moon was very close to the earth at this time.

3.82 Suggestion [14112016-2]

Is it possible to demonstrate, that a plant is mourning if its humans (that used to watering it) is missing?

3.83 Tap water versus melted snow [14112016-3]

Played with tap water for long time. After $\sim$ 1 hour the music stopped, two red LED turned on.Measurement of the resistance in the tap water showed 6 kΩ.

The water was replaced with melted snow and the resistance was measured to 70 kΩ. The music returned.

OBS: Melted snow has a 10 times higher resistance than tap water.

3.84 Resistance in different water samples [14112016-4]

The resistance in different water samples was measured with the Arduino hygrometer electrode in a glass wessel and an Ω - meter, se fig 20.

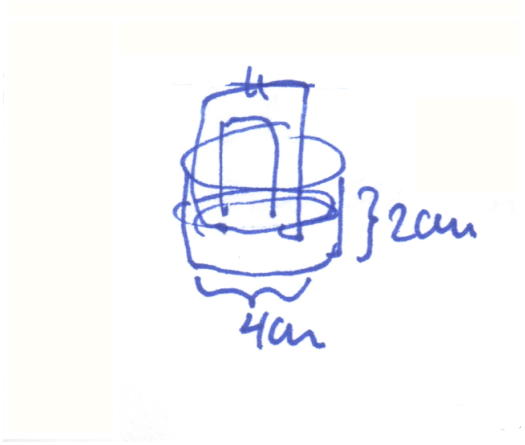

Figure 20: Arduino electrode and water in a glass, See section 3.84

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Type of water	Resistance
Melted snow	40 kΩ/30 kΩ
Tap water	10 kΩ/5 kΩ
Lake water (Skanderborg)	18 kΩ
Rain Water	24 kΩ
Park water (Frederiksberg)	16 kΩ
Sea water (Sejerø bay)	16 kΩ
Tap water exposed in a crystal light bed	6 kΩ

Table 5: Resistance in different water samples.

3.85 Best photo-resistor [10122016-3]

VT 33N3 160 kΩ/2 MΩ photo-resistor is the best for recording light because of the large resistance value, which fits the MOPT device.

3.86 Sunset recorded with photo-resistor [03122016]

Sunset recorded with the VN33N3 photo-resistor.

3.87 Playing with a weeping fig at 3 hours intervals [14122016]

Played with weeping fig indoors at 13:30 - 16:30 - 19:30 - 22:45 and 08:18 in order to detect changes during the day.

No major difference was noticed. The green electrode was moisturized with saliva to make connection to the leaf. It is a question whether the plants actually sleeps in the dark and the development in the melody only reflects the evaporation of the saliva used to make connection.

Resistance measurement was >20 kΩ.

3.88 MOPT response sensitivity test. [21122016]

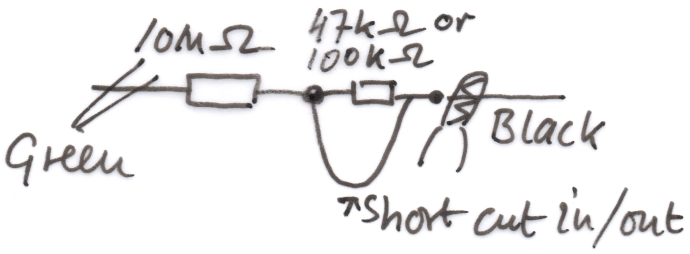

Figure 21: Two resistors in series, one can be bypassed by a shortcut.

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Response test: A 10 MΩ resistor in series with a 47 kΩ or a 100 kΩ resistor. The music of the plants device played on [06 Elpiano 2] and the green LED was turned on and no sound was heard. This indicates a very stable situation,that with the instrument elpiano 2 translates to a pause in sound, while with other instruments like the violin, gives rise to a sustained long

note with constant pitch.

Then the 100 kΩ resistor was shorted which resulted in a sequence of 2-3 notes (the gain bottom turned to the right).

The experiment repeated with 47 kΩ resistor instead of the 100 kΩ resistor the same happened: a sequence of 2-3 notes was generated (this time the gain bottom turned upward).

The same experiment repeated with 20 kΩ resistor instead of the 47 kΩ gave no clear indication of a change.

Conclusion: The MOPT device is seemingly sensitive to a $\pm$ 0.5 % change in the resistance. ($\frac{10M\Omega}{10M\Omega+47k\Omega} \sim 99.5\%$).

4 2017

4.1 Water/resistor under singing bowl [06012017]

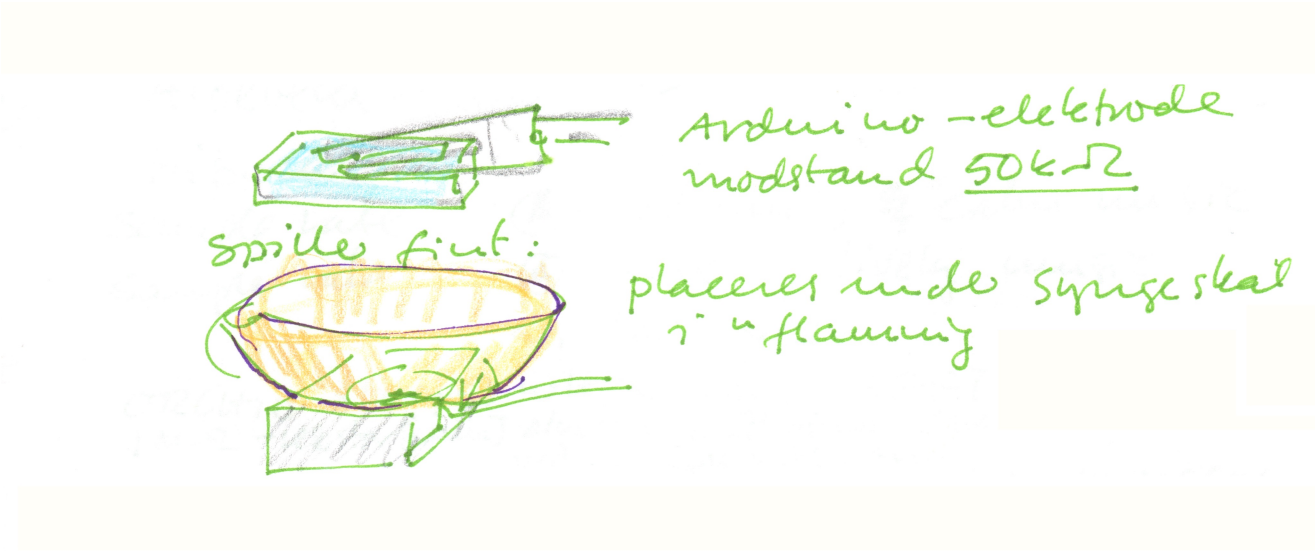

Figure 22: Small box with water under a Tibetan singing bowl.

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A. Played with water in a small plastic box using an Arduino Hygrometer electrode. The resistance was 50 kΩ, see fig 22.

B. The box with water was then placed under a Tibetan singing bowl supported by a piece of expanded polystyrene packaging (figure 22). When the singing bowl was activated the water playing via the MOPT device kept the same note for a long time.

C. The water and the Arduino electrode under the singing bowl were replaced by a 6.6 MΩ resistor. When the singing bowl was activated the resistor playing via the MOPT device also kept the same note for a long time.

4.2 One year later [12012017]

Repeating playing in the evening with same orchid and hibiscus plants as one and two years earlier, see the sections 2.1 and 3.3 page 10 and 14.

When the sample rate is on max the plants played lively like the preceding years, and when the sample rate was medium, the music was more calm.

The orchid stopped playing when a person in the room left a chair.

But a 1 MΩ resistor with sample rate on max played totally calm, almost no shifts in notes (except for the first 5 notes), and the green LED turned on constantly.

4.3 Repeating playing with same plant [16012017]

Repeating an experiment from 12 January 2017 with the same plant, the same time of the day, same sample-rate, same instrument - sounds almost the same.

Influence of the sample rate investigated: number of notes per 10 sec. varies from [0-3] at min. sample rate to [10-20] at max. sample rate.

4.4 White marble, with slowly rising pitch [16012017-2]

White marble soaked in water for 72 hours and wiped dry with paper, sample rate near medium:
The pitch increased slowly in 30 sec. then the red LED om the right side was turned on, music stopped. - after a while then music returned in low pitch and slowly changed to high pitch in 30 sec. as before.

Suggestion: The water vaporizes slowly from the surface of the marble, resulting in a relative higher resistance, which translates into a higher pitch (relative to the preceding notes).

4.5 Topsoil from the garden [19012017]

Figure 23: Topsoil in a clay pot with an Arduino hygrometer electrode.

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Played with topsoil from the garden in a little clay-pot.

Resistance ca. 100 kΩ. Gain set on minimum. It played calm/slow with about 10 notes per min. Deep notes different from plants/marble.

4.6 Two samples of water and Himalayan salt [27012017]

Played with blessed water and water stored i a glass with a label with the word "love" and Himalayan salt (Aduino hygrometer electrode used in all experiments).

Salt played more lively than water (more notes per min.).

Turning the sample rate to its max value (with water only), results in notes coming pair-wise. If a pair was considered as one note, the number of notes per minute was not increased.

4.7 Cucumber [01022017]

Played with slice of an ECO - cucumber on top of an Arduino Hygrometer electrode.

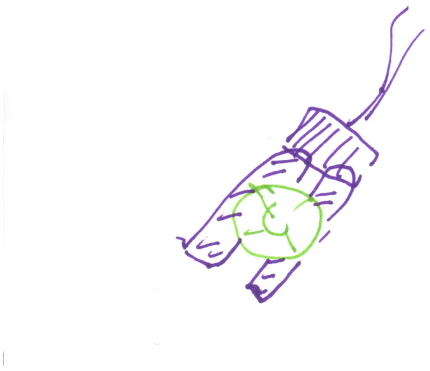

Figure 24: Slice of cucumber on an Arduino hygrometer electrode.

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4.8 Winter Aconite [02022017]

Played with a Winter Aconite outdoors in the garden, the temperature was 2°C.

It played deep notes, maybe the temperature has an influence on the pitch?

Proposals for future experiments: Banana, chestnut, a hand and Common Yew (Taxus Baccata)

4.9 Cucumber repeated [04022017]

Played with a slice of cucumber as in the experiment in section 4.7, but this time with the "Scale" setting changed fom Major to "12" and the gain turned to min.

The melody was now different from the one in the experiment in sec. 4.7.

4.10 Clementine, lime, orange peel [11022017]

- Played with a piece of clementine.
- Played with a slice of lime.
- Played with a peel of orange.

All played nicely, lime with a 1 MΩ resitor in series.

4.11 Water on top of a speaker [12022017]

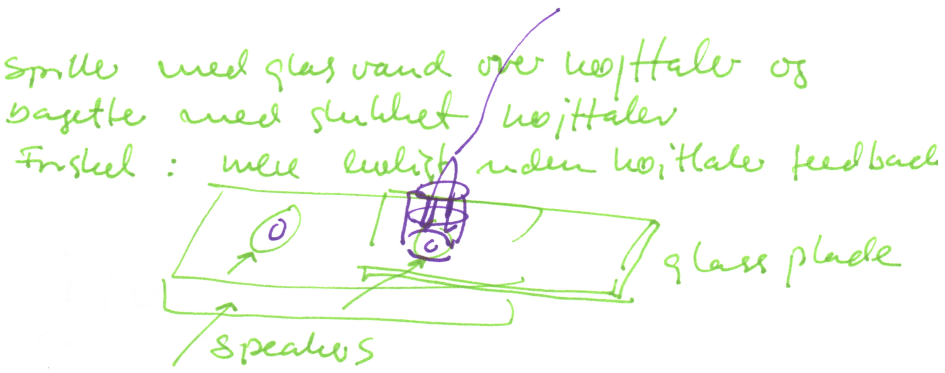

Figure 25: Water placed on top of a portable stereo speaker.

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Played with water on a speaker: Placing water in a glass on a glass-plate above a speaker. Later the speaker was removed and turned off.

The music was more lively without the the loudspeaker feedback.

4.12 Stroposcopic lamp [17022017]

Using a photoresistor and a stroboscopic lamp with frequency 3 Hz: The MOPT reacts rytmically, the music followed the light periodically.

4.13 Snowdrop and Winter aconite [18022017]

Played with Snowdrop and Winter Aconite 1 P.M..
Snowdrop only played on setting Hi, Winter Aconite only on setting Lo.
Recordings: IMG_2614 and IMG_ 2615.

Played with a little common yew outside. Setting [Lo]. Recording: IMG_2618.

Plant type	Setting	Sample rate
Snowdrop	Hi	Medium
Winter Aconite	Lo	Medium
Winter Aconite	Lo	Maximum
Snowdrop	Hi	Maximum

4.14 Resistance in Winter Aconite, Snowdrop [18022017-2]

The resistance from earth to leaf was measured with a digital multimeter.

1. Snowdrop (big leaf): 2 MΩ
2. Snowdrop (tiny leaf): < 10 MΩ
3. Winter Aconite: 0.3 - 0.5 MΩ

This is consistent with the settings used in the experiments in section 4.13, where the setting for Winter Aconite was Lo and for snowdrop it was Hi.

4.15 Ice, resistance measurements [28022017]

The resistance of an ice cube $1 \times 5 \times 30$ mm was measured directly from freezer and some time later.

Cold ice: Temperature $-18°C$, resistance: $\sim$ 20MΩ
Partly melted ice: Temperature $0°C$, resistance: $\sim$ 0.5 MΩ

The measurements supports the hypothesis that while melting the ice gives sounds in the MOTP device becoming deeper and deeper (lowering the pitch) as time goes by.

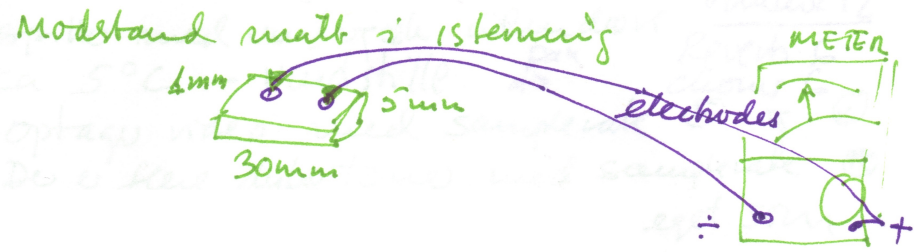

Figure 26: The resistance in ice measured with a multimeter.

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4.16 Snowdrop, repeated from last year [12032017]

Played with a snowdrop plant outside (windy weather), a repetition of the experiment from last year, see section 3.7. on page 15.

With the sample rate on max. the tempo was like last year.

With sample rate on medium the tempo was more moderate than last year.

But the pitch was much deeper (lower) this year than last year !? Why??

4.17 Snowdrop, repeated again from last year [13032017]

Played with a snowdrop plant outside (no wind, 5°C), a repetition of the experiment from last year, see section 3.7. on page 15.

Videos with sample rate medium and maximum were recorded on Ipad: [IMG_2623, IMG_2624, IMG_2625].

Settings:

- Instrument: 06 el piano 2
- Volume: 12
- Reverb: 6
- Chorus: 6
- Spacial: 7
- Pan: $\leftarrow\rightarrow$

Observations:

1. More deep pitch notes were observed with sample rate medium compared to sample rate maximum.
2. The melody pattern with sample rate maximum was very similar to the pattern observed last year 14-03-2016 at 5 p.m. (section 3.7. on page 15).
3. When recording sound only [Snowdrop_13032017.wav], no person present, the melody sounds different. It is better to be present and be filming.

4.18 "Power Pack" treated lemon [27032017]

A slice of a lemon that was treated with "Power Pack", a device that is energized and sold to improve agriculture performance, was compared with a piece of an ordinary lemon. In both cases a 1 MΩ resistor in series with the MOTP devise.

The treated lemon played (maybe) more lively than the untreated.

4.19 Adjustable resistor [27032017-2]

An adjustable resistor 0 - 1 MΩ was adjusted to approx- 0.3 MΩ.

Playing with the resistor while turning to greater resistance entailed higher pitch notes.

Playing with the resistor while turning to smaller resistance entailed lower pitch notes.

Playing with the resistor while not changing the resistance resulted in a pause in the music.

4.20 Water between plexi-glass plates [30032017]

Played with a thin layer of water between two plexi-glass plates. It played lively.

When a person in the room started to unload groceries and walked in and out the door, the LED's on the front af the MOTP - device moved from green to yellow to red, and the music stopped.

4.21 Maple tree and chestnut tree with buds [07042017]

- Played with a Maple tree with buds (before the leaves were formed).

- Played with a chest nut tree with buds.

The electrodes were 1) a stainless steel nail in the ground and 2) an electrode label on the trunk.

Later an additional experiment was performed with the chest - nut tree, with the green electrode on a small branch replacing the electrode label on the trunk.

In all experiments the pitch was rising continuously until the red LEDs were turned on and the MOTP device and the music stopped.

It was expected that the the trees would be playing in low pitch because it was springtime, and the trees were preparing for the leaves to unfold, but this expectation theory was not supported by the experiment.

Proposal: play with a sugar water solution.

4.22 Structured water [13052017]

Played with structured water, prepared by the tornado method, with the two plastic bottles on top of each other. Four times circulated/whirled around. See figure 27. Electrode: The Arduino hygrometer electrode, setting [L]. Resistance measured to 30-100 kΩ. This is quite low, wonder why the MOTP devise accepted this low value?

Figure 27: Two plastic bottles on top of each other used to structure water.

4.23 Pine tree and wild rose near Dolmens [14052017]

Played with a pine tree, the same as described in section 3.12, page 16. This time it played with more deep notes and soft melodies.

Played also with a wild rose bush near by the pine tree, setting: instrument: FX4.

The wild rose played a different melody compared to the pine.

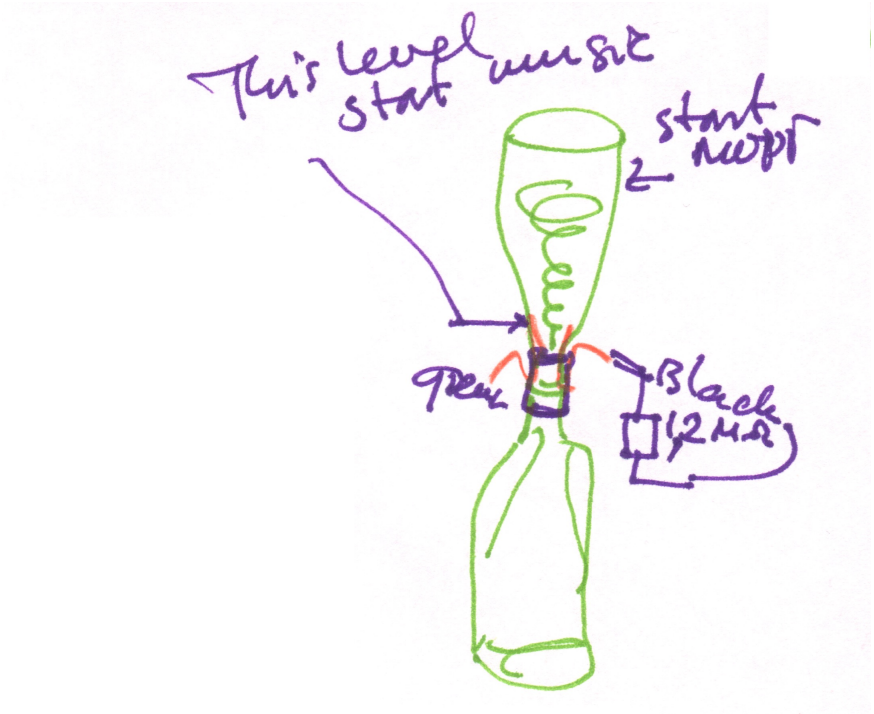

Figure 28: Two plastic bottles with copper electrodes inside the upper.

4.24 Structured water [31052017]

Two plastic bottles on top of each other making structured water by tornado method, with copper - band electrodes in the bottleneck of the upper bottle. Plus a 1.2 MΩ resistor in series with the green electrode.
See figure 28. page 53.

Observed:

1. One deep note at the start of the tornado movement.
2. A pause in sound while the water i circulating downwards.
3. Just before the upper bottle is totally empty, music starts again.
4. Played for some time 10 - 30 sec. after the movement in the upper bottle stopped.
5. The playing in section 3, and 4. was melodic.

4.25 Two plastic bottles - 2 [04062017]

The same set - up with two bottles as in section 4.24, see figure 28, page 53.

The resistance in the water between the electrodes was measured with a digital multimeter to be 30 kΩ during the water tornado down-let.

The change in resistance cannot explain why the MOTP device did not play during the down-let in the experiment at 31 may 2017 described in section 4.24, page 53.

4.26 Rapeseed oil [15062017]

Resistance measured to more than 4MΩ. But the oil would not play.

Trying to structure the oil with the tornado method, but pure oil cannot make e tornado.

Oil mixed with water in the ratio 2 water: 1 Oil, the mixture is able to make a tornado.

4.27 Technical settings, iPad recordings [19062017]

Video recording on iPad with setting "1 note"

Volume: -7 steps from max entails best sound quality.
Instrument: Pad2 (best), Pad4

Video recording on iPad with setting "3 note"

Instrument: FX2, FX4 (works also)

4.28 Geopark Event, Beech tree and Maple tree [28062017]

Played with a beech tree and a maple tree in "Høve Forest" in the afternoon 2 - 3 p.m. with 90 spectators + 3 dogs and a horse. The trees played at once.

4.29 Spring water from Holbæk [10082017]

Played with spring water from the city of Holbæk, the water was collected two days earlier.

The resistance in the water (Arduino hygrometer electrode) was less than 50 kΩ, about 45kΩ, whereas tap-water had a resistance of about 70 kΩ.

4.30 Spring water from Skäralid [01092017]

Played with spring water from a spring in Skäralid, Sweeden. Many deep notes were played.

4.31 eSense SKIN RESPONSE recordings [1302017]

Different water samples were recorded with the "eSense SKIN RESPONSE" app:

Type of water	Origin	Time of measurement
Spring water	Holbæk	5.07 p.m.
Tap water	Asnæs	7.12 p.m.
Spring water	Holbæk	7.16 p.m.
Structured water	Asnæs	7.29 p.m.

4.32 Oak, "Teglværkseg" [11092017]

Played with an old oak tree. One electrode in the ground, the other on a leaf. Instruments: Churchorgan, Elpiano2, Pad2 and FX4.

The oak played with long pauses on church organ and either the left or the right LED turned on (during the pauses).

Played more fluent on Elpiano2. [Recorded on Ipad and Zoom recorder].

4.33 1 MΩ spun resistor [05102017]

Played with a 1 MΩ spun resistor: Sample rate: Max , this means a rapid collection of sounds but still long pauses longer than 2 sec. was observed.

With the sample rate at medium a slow "bing - bong" was heard in the beginning, but still long pauses longer than 2 sec. was observed.

4.34 Active coal, maple [06122017]

Active coal (medical coal) in a small capsule with two steel nails. (see figure 29, page 56. The resistivity was measured to about 40-300 μS.

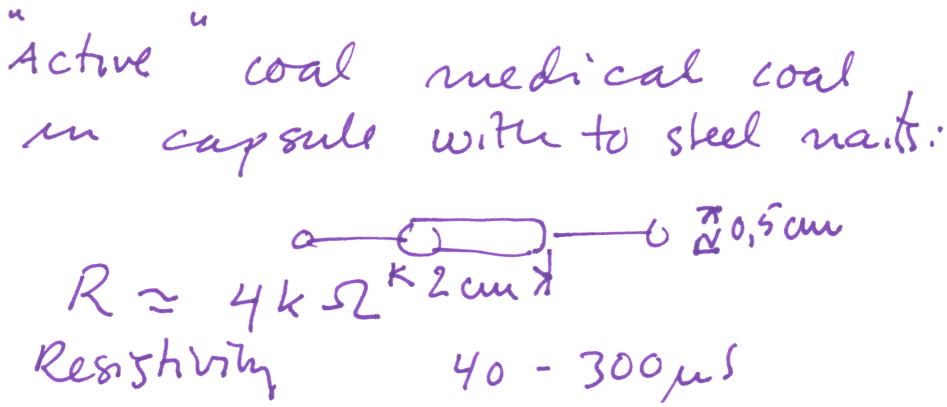

Figure 29: Capsule with active coal and two steel nails.

Maple soaked in water for more than a month had a resistivity measured by eSense SKINRESPONSE to 0.79 μS.

5 2018

5.1 Outdoor trees in a kindergarten [18042018]

Played outdoors with several trees in a kindergarten together with 44 children and 4 grown ups.

5.2 Succulent [06052018]

Played with a succulent (plant) for two guests, one recorded the music.

5.3 Thorn and spruce [11052018]

Played with a group of 18 (female) scouts outdoors, first a Thor tree and next a spruce.

The children touched one after another the tree and the others were listening to hear if the tree changes "melody". Several children registered a difference in the "melody" with different persons.

5.4 Oak and Blackberry Bush, Geopark event [04082018]

Played with an old oak, "Teglværkegen" in Ulkerup Forest as a part of the Geopark Festival 2018. Observations:

- The Oak tree played at once (1 hour before the visitors arrived).
- The tree played at once after the people had arrived. - but now in a more soft/heartily tone than before people had arrived.
- Played also with a Blackberry Bush nearby. This plant had more low notes (low pitch notes).
- A man in the audience had hearing aid, and he explained: My ear apparatus could not stand the Oak Tree, I had to switch it off. But the Blacberry was OK and I could switch it on again (because the notes were more deep).

5.5 SeaWater [–082018]

Two Adder Stones with copper-wires wrapped around the stones via the holes were placed in the sea ("Sejerø Bay"). The wires were insulated (plastic) and the insulation removed only the final 1-2 cm of the wire. The stones were 1 meter apart and 2 meter from the shore.

Resistance in the water between the wires was measured to about 1.0 MΩ.

This means, that the MOPT device might be able to play with the sea water.

5.6 Two MOTP devices [–082018-2]

1. Two MOTP devices on the same plant (Potted Orange tree). Two different ground electrodes, two different green electrodes on the same leaf, near to each other.

   They played somewhat different.

2. Two MOTP devices on two different plants placed near each other. (Orange tree + unknown).

   The plants sounded somewhat similar (Instrument: 006 El piano 2).

5.7 Tap water and Structured water (Bamboo) [–082018-3]

Tap water and Structured water was recorded with the Bamboo-M device.

1. Structured water played a rising scale of notes with increasing pitch.
2. Tap water played in a more melodic way

There was a difference!! And the difference was only present if the two glasses of water was separated more than 2 meter!

5.8 Red spruce and Beech, Jyderup Forest [17082018]

1. Red spruce nominated as a "Life-Tree" by the Danish Nature Agency. One self-adhesive electrode on the steam, one electrode in the ground, recording [zoom STE-053], video [IMG_0632].
2. Nearby Beech/Birch?? tree, one self-adhesive electrode on the steam, one electrode in the ground, recording [zoom STE-054].
3. Nearby Beech/Birch?? tree, one electrode on a leaf, one electrode in the ground, recording [zoom STE-055]

There was a great difference between Fur/Beech and a great difference between having electrode on steam versus leaf.

5.9 Music of the Plants at "The golden Circle" [19082018]

Played with a big potted plant indoors. When a smaller potted plant was pushed slowly close (less than 1 meter) to the big plant, the melody of the big plant changed!

5.10 Water played with Bamboo-M device [–082018-4]

Played with water in a cylindrical glass, 4 cm in diameter, 3 ml water at the bottom and an Arduino hygrometer electrode.

It played fine, the pitch was sinking during time. (The setup is similar to figure 14, page 31, but in this experiment $h = 0.2$ cm).

5.11 Maple trees [18092018]

Two Maples trees in "Ulkerup Forest". Bamboo-M device. Electrodes on a leaf and in the ground.

1. Maple tree with one trunk, recordings: [Bamboo 03] [File: Ahorn1stammet].
2. Maple tree with two trunks, recordings: [Bamboo 04] [File: Ahorn2stammet].

Melodic recording 1 min.

5.12 Pine near "Dybesø" [09102018]

A pine tree with 5 trunks near "Dybesø", Odsherred.

One elecrtode on a leaf, another in the ground. Played deep notes. Recording 1 min: [Bamboo 05] Recording 5 min: [Bamboo 06].

5.13 Live plant music as a wedding gift [15102018]

Played outdoors for a just married couple. With a little oak, the couple had planted.

a. First we played with the tree alone.

b. Next playing with the tree and bride nearby.

c. Finally with the tree + bride and groom.

The tree hesitated a little while the bride approached - then played more deep notes with the bride, when the groom arrived more high pitch notes came in.

5.14 Oak in Tranmose, Ringkøbing [30102018]

Played with an oak in Tranmose, recording 1 min. [R 07].

5.15 Rosemary, potted [20112018]

Played with potted Rosemary, recording [Bamboo R 08]

5.16 16 potted plants in a primary school class [06112018]

Played with 16 potted plants in primary school class. Each child had brought a potted plant from their home.

A few small plants needed a 1 MΩ resistor in series to promote playing.

1. A very obvious variance in the playing was observed.
2. Many pupils commented that the music made them happy and/or relaxed.

6 2019

6.1 Sea water resistance measurement [06032019]

Two wires on a 1.75 m broom handle, the insulation removed 2 cm in each end. The broom handle was placed in sea water 1.5 m from the shore. Resistance measured to 300 Ω.

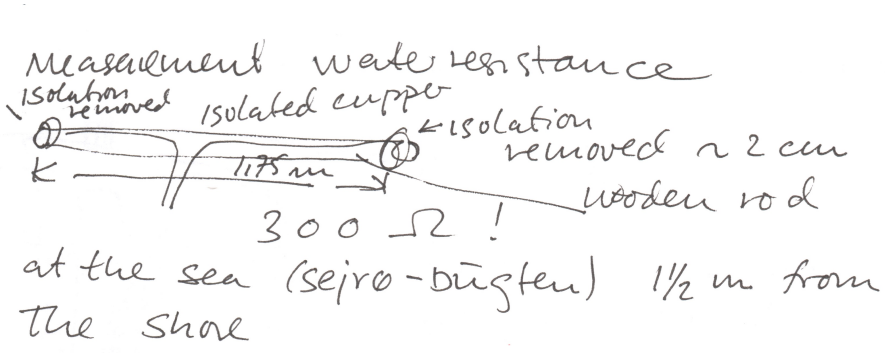

Figure 30: Insulated copper wires on a broom handle.

6.2 Wires cut perpendicular [09032019]

If electrical wires are cut perpendicular to the wire direction, and no further insulation is removed, in a way that no copper sticks out (see figure 31, page 61.), the resistance in tap water was measured to 50 kΩ.

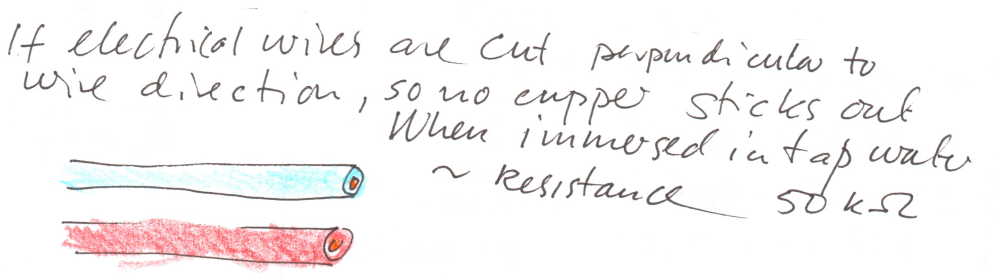

Figure 31: Insulated copper wires cut perpendicular.

6.3 Wires in sea water [11032019]

Two copper wires cut perpendicular were attached to a stone (see figure 32, page 62.). The stone was thrown into the sea ("Dragsholm Offentlige Badestrand") And the resistance was measured by an Ω - meter. The reading was 20 kΩ.

Some water brought back home played with the Bamboo - M device, and at home the Ω - meter also showed 20 kΩ.

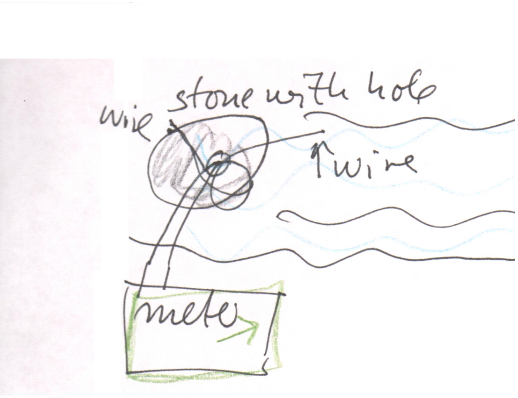

Figure 32: Insulated copper wires cut perpendicular.

6.4 Water resistance, time dependent [12042019]

Water resistance measured with an Ω - meter and an arduino hygrometer electrode, the water level was adjusted to the fourth pair of holes in the electrode, see figure 33. page 63. The change in resistance with time might be a temperature effect.

Demineralized-water	Tap-water	Structured tap-water
110 kΩ	15 kΩ	12 kΩ
After 60 sec.	After 60 sec.	After 60 sec.
90 kΩ	14 kΩ	17 kΩ

Table 6: Time dependent resistance in different water samples.

6.5 "Trolls tree" [28052019]

Played with a beech, the "Trolls tree" in Nykøbing Sjælland. (26 people listening.)

When a leaf next to the leaf carrying the electrode was touched by hand, the melody shifted to a lower pitch.

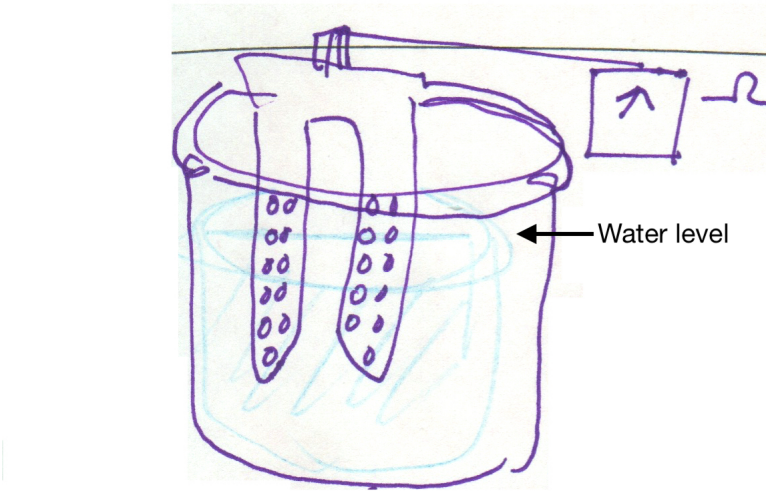

Figure 33: Water level at the fourth pair of holes.

6.6 Conversion table humidity/resistance [28052019-2]

Calibration of a humidity meter with known resistors. (See table 7.)

Using the table:
A Maple - tree outdoors 15% $\sim$ 20 MΩ.
A Chestnut - tree outdoors 21% $\sim$ 6.66 MΩ.

Resistance MΩ	% Humidity
0.415	44
0.470	41
0.680	38
1.000	32
2.00	27
6.66	21
10.0	20
16.67	17
20	18
56	14
112	10

Table 7: Table of conversion from resistance to humidity in wood.

6.7 Chestnut humidity around the clock [09062019]

The humidity in a chestnut tree was measured between a ground electrode (20-30 cm from the tree) and an electrode on a leaf or on a leaf stalk. (See figure 34. on page 65 and table 8. on page 66.)

6.8 Potted Mimosa [–062019]

With an Arduino hygrometer electrode in the soil of a potted plant (Mimosa) the resistance was measured to 27 kΩ. When touching the leaves all leaves were folding up. After about 10 sec- the resistance in the soil changed to 25 kΩ.

6.9 Event at "The Golden Circle" [22062019]

Played outdoors at "Den Gyldne Cirkel" spiritual course center with a pink puppy [IMG_1113_MOV], a rose and a red beech tree.

One spectator played a quartz crystal bowl simultaneous with the tree, but it had no effect on the melody of the tree.

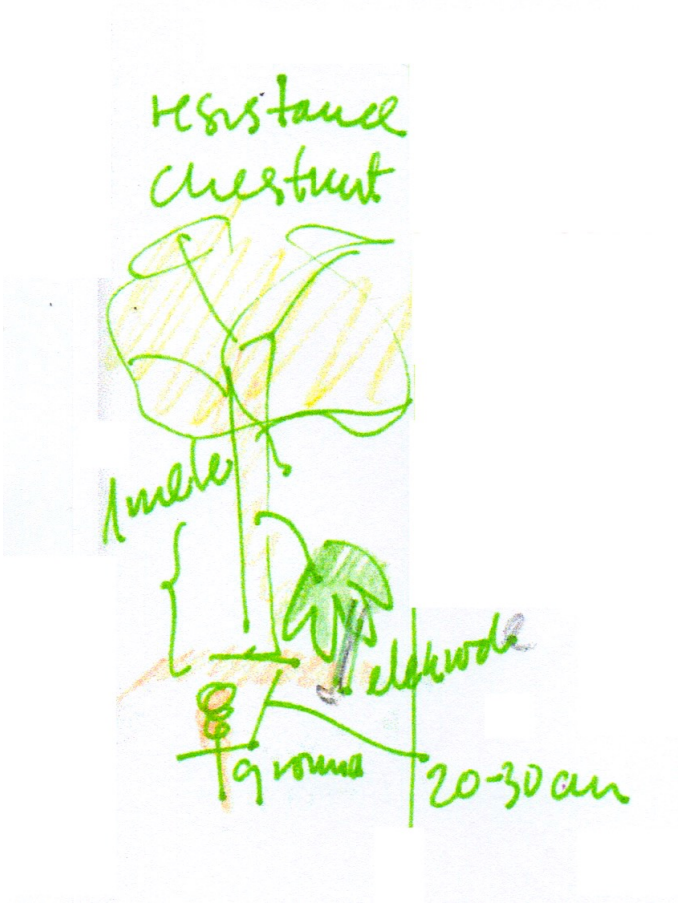

Figure 34: The placement of electrodes on the chestnut tree.

Date	Time	Humidity
09-06-2019	16:45	Leaf: 36-37%
		Stalk: 44%
10-06-2019	11:30	Leaf: 21%
		Stalk: 17-21 %
	15:35	Leaf: 36%
		Stalk: 44%
	18:40	Leaf: 22%
		Stalk: 15-22%
	21:00	Leaf: 15%
		Stalk: 20%
11-06-2019	10:15	Leaf: 19%
		Stalk: 25 %
	14:59	Leaf: 21%
		Stalk: 25%
	15:45	Leaf: 15%
		Stalk: 25%
	17:00	Leaf: 36%
		Stalk: 44%
13-06-2019	11:00	Leaf: 20%
		Stalk: 20 %
14-06-2019	08:40	Leaf: 17%
		Stalk: 22 %
	16:45	Leaf: 21%
		Stalk: 20%

Table 8: Humidity in a chestnut tree around the clock.

6.10 Seawater, test of broom handle setup [25062019]

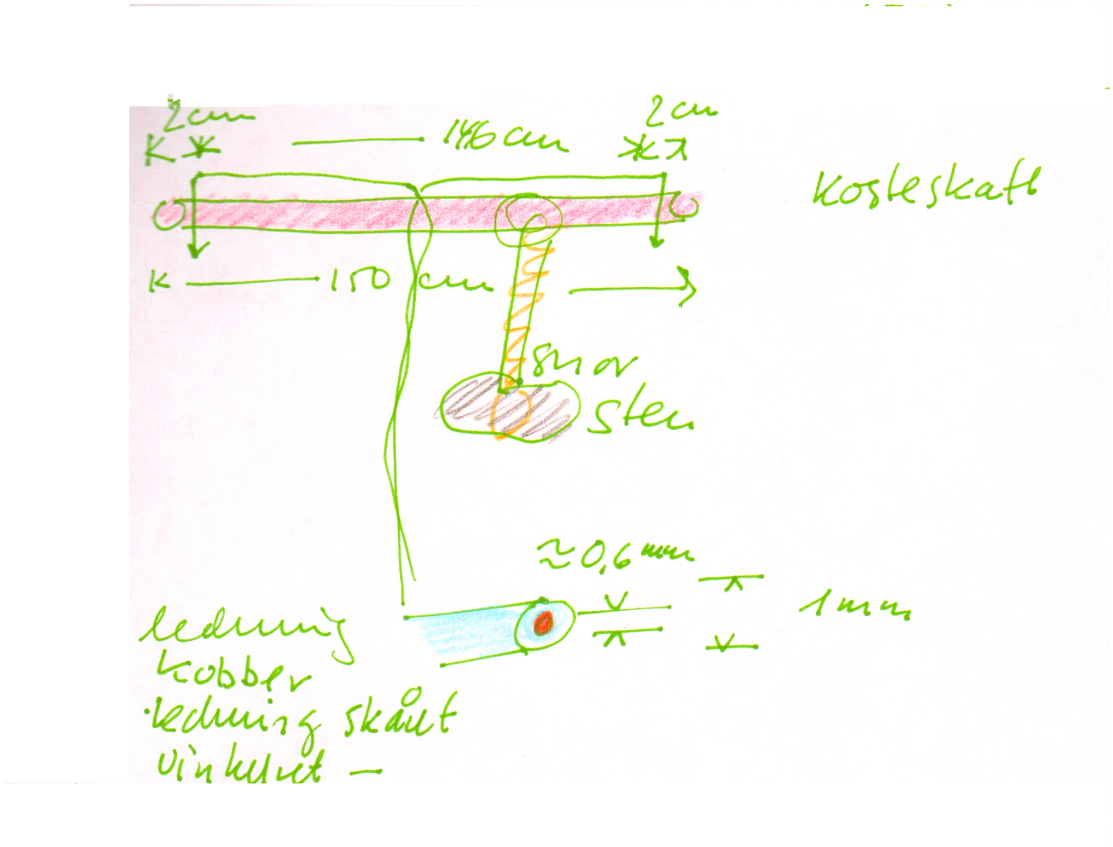

Figure 35: Design of the broom handle setup for recording seawater.

Bamboo - M device played with two insulated copper wires (0.6 mm diameter), with the ends 146 cm apart on a broom handle immersed in sea water.

The wires were cut perpendicular to the direction of the wire, so that only a small circle of copper (diameter 0.6 mm) is in contact with the seawater.

If 2 cm or more of the insulation was removed at the end of the wires, the Bamboo - M device tdid not play. (Too low resistance.)

6.11 Rush, wormwood [29062019]

Played with rush and wormwood at "Plejerup Huse" near the beach.

Recordings (From the Bamboo - M device):

Rush: IMG_1152 (iPhone), IMG_2948 (iPad).
Wormwood: IMG_12951 (iPad).

6.12 Spun resistor 47 MΩ [–062019-2]

Bamboo played with a 47 MΩ spun resistor but not with a 56 MΩ resistor. Very slow and long pauses of 3 -5 sec. duration.

MOTP played (at setting Hi) with a 56 MΩ resistor and at the same setting also with a 112 MΩ resistor.

6.13 Potted Mimosa - 2 [–062019-3]

With two electrodes 5 cm apart in the soil (between the roots) of a potted Mimosa plant the resistance was measured to 50 kΩ.

When touched all the leaves were folding up. The resistance in the soil dropped to 32 kΩ.

6.14 Mimosa untouched and touched [06072019]

Played with a potted Mimosa, the green electrode near the soil.
See figure 36, page 69.

Recorded:

Untouched: Bamboo [1] Touched, 30 sec. after touch: Bamboo [2]

6.15 Seawater in "Sejerø Bugt" [24062019-2]

Sea water in "Sejerø Bugt" played melodic.

3 × 1 min. recordings were made : [R6],[R7] and [R8].

The setup with electrodes can be seen in figure 35, page 67.

Figure 36: Potted Mimosa with Bamboo electrode near the ground.

6.16 Potted and cut plants [03102019]

Played indoors to 11 members of a senior resident association with potted plants and cut plants.

The cut plants played with a very varied sound.

6.17 Bamboo - Roland technical note [–102019]

Recording from Bamboo to Roland R-05 recorder:

Use " line in" connection and set recording volume to 80.

6.18 Tap water and dish washing liquid (sulfo) [22112019]

Played with tap water and Bamboo device after 1:28 min sulfo (dish washing liquid) was added.

The pitch was changed to low pitch and the music stopped for about 4 sec. and the the music reappeared nearly the same pitch as before the sulfo was added.

6.19 Gelatin [07122019]

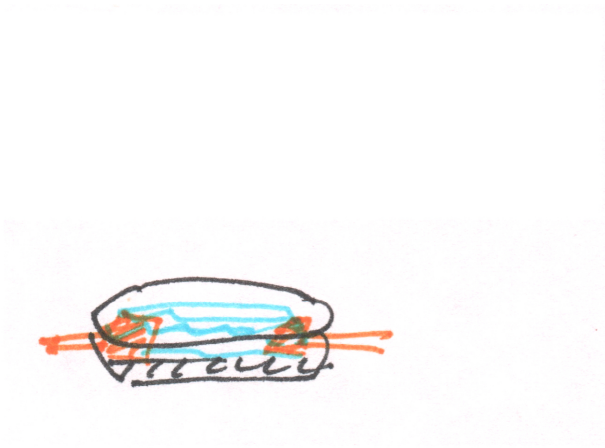

Figure 37: Gelatin, water and electrodes in a mall glass jar.

Played with Gelatin + water in a small glass jar and a 1 MΩ resistor in series. [STE-066].
Played with the 1 MΩ resistor alone [STE-067].
Played with tap water(without gelatin) and the 1 MΩ resistor [STE-068].

Long pauses (more than 20 sec.) with the gelatin. The resistance in the water was 6 kΩ

7 2020

7.1 Two devices and one/two plants [20012020]

Played indoors with a Hibiscus and a Kalanchoe Blossfeldiana.

Two MOTP devices were used one with instrument 06-piano2 the other with instrument 42-Viola.

1. Played with the two different plants simultaneously with each plant connected to "its own" device.
2. Played with one plant connected to two different devices.

When two devices are connected to the same plant, the melodies are not identical.

Film iPad: [IMG_2995]

7.2 4 potted plants playing for a visitor [25022020]

Played indoors with potted plants for a visitor who recorded the playing.

1. Citrus - tree. (Played well).
2. Orchid no. #1 and orchid no. #2 (None of them did play).
3. Hibiscus. (Played well).
4. Avocado. (Played well).

7.3 Conductance of illuminated water [–082020]

The conductance of water illuminated with a LED - Torch was measured with an iPhone and the eSenseSkin response app.

Two electrodes in a cylindrical glass and a recording of the electric conductance (measured in μS) before during and after the water was illuminated.

A. With two copper electrodes, , great reaction during illumination.

B. With two stainless steel electrodes almost no reaction during illumination.

C. With two stainless steel electrodes, a great reaction when an additional drop of water was added to the water or is sucked up from the water with a glass tube. - No reaction when a drop of water on a wooden stick was transferred to the water.

7.4 Water in a slide frame [07082020]

Played with water in a slide frame with two copper electrodes (copper tape, width 3-4 mm). See figure 38, page 73. The conductance was recorded the eSense-SKIN-Responce app in iPhone. The slide frame was illuminated with a LED torch in the interval 20 - 40 sec. during the recording of the conductance.

See figure 39, page 74.

Recorded with Bamboo 10 min. [R17]. After 5 min illuminated with a LED torch in circular movements. The music turns more lively for about 2 minutes , and then return to calm as before the illumination.

7.5 Oak [08082020]

Played with an Oak near a pedestrian tunnel. 2:55 - 3:00 p.m.
Recorded Bamboo [R18], [2020_Oak_Asnaes.wav].

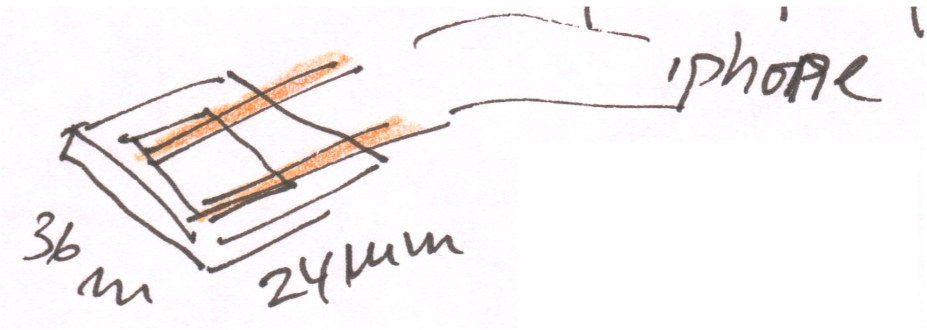

Figure 38: Slide frame with two copper electrodes.

7.6 Water [23082020]

Played with water that had been stored in a cylindrical glans with a picture of crop circles wrapped around it for many months. min recording: [STE-0.69.wav].

7 min recording [STE-070.wav]. Shaking the glass after 6 min. had no effect on the music.

Recorded tap water with Arduino electrode and the water level up to the first pair of holes, see figure 40, page 75.

7.7 Water [23082020-2]

Played with tap water, recording 10 min. [STE-0.71] shaked after 7 min. (Filesize 106 Mb).

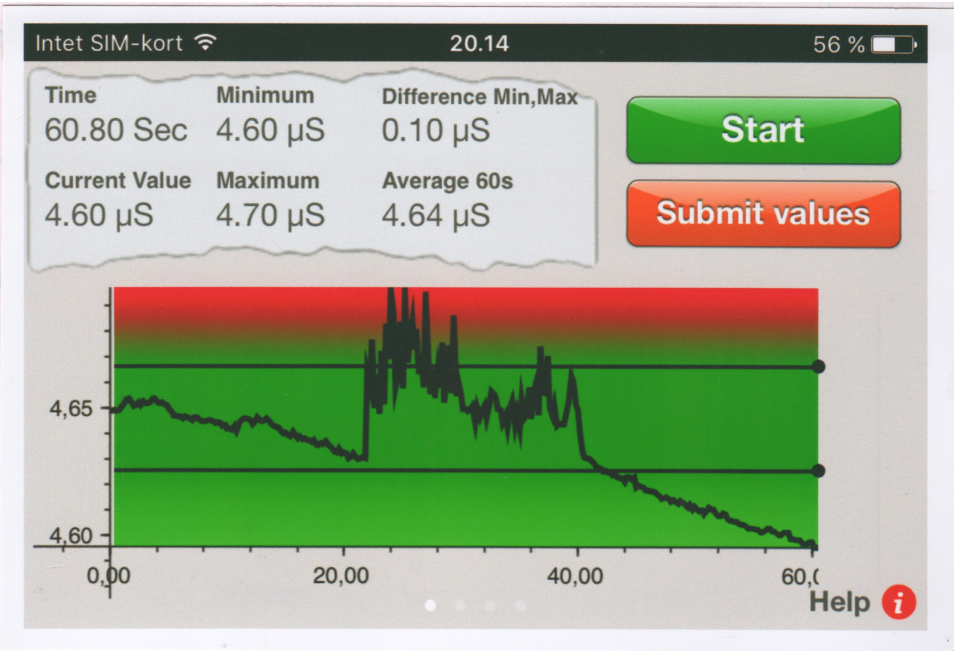

Figure 39: Conductance of water illuminated between 20 and 40 sec.

7.8 Water in a lake in Asnæs [27082020]

Recorded water in a little lake in Asnæs, two wires mounted through a cork were used as electrodes, see figure 41, page 75.

Bamboo Recording [R19], wav file: STE-072.

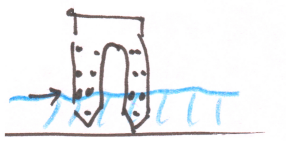

Figure 40: Water level up to the first pair of holes on the Arduino electrode.

Figure 41: A cork with two wires used to record water in a lake.

7.9 Rain water [28082020]

Three water samples were measured with an Arduino electrode, the water level was up to the fist pair of holes, see figure 40, page 75.

Type of water	Resistance kΩ
Rain water	120
Tap Water	70
Rain water	75

Table 9: Resistance in water measured with an Arduino electrode.

7.10 Plants outdoor [12092020]

4 outdoor recordings $\sim$ 10 min with Bamboo device: [R05-110], [STE-077], [STE-078] ,[STE-079] ,[STE-080] and [STE-078]. One recording was acoustic with birds song from the environment [STE-077].

1. Mint.
2. Lemon balm
3. Malva Moschata
4. Sage.

7.11 Beech, Grevinge Forest [31102020]

Beech recorded on Bamboo device 3 min. [R20], [R05-111.wav] and [R05-112.wav].

8 2021

8.1 Pine in winter time, temperature -5 °C [13022021]

Tried to play with the Bamboo devise and a Pine outdoor near a pedestrian tunnel.

The weather was very cold, the temperature was -5 °C .

Three different electrode setup were tried out:

1. Both electrodes on the steam.
2. One electrode on some needles another electrode on the steam.
3. One electrode on some needles another electrode in the ground.

No music! The Bamboo device said: “Bad Contact”.

Maybe the low temperature or the dry air caused the resistance in the tree to be too high (greater than 20MΩ

8.2 Calibration e-Sense-SR [26052021]

Calibration of the e-Sense App for two iPhones with resistors:

Resistor MΩ	eSense iPhone 4	eSense iPhone SE
1	1.43 μS	1.43 μS
6	0.69 μS	"Contact lost"
10	0.65 μS	"Contact lost"
20	0.61μS	"Contact lost"
26	0.60 μS	"Contact lost"
2	0.99 μS	0.99 μS

8.3 Solar distilled water [17062021]

Played with 1 ml water in a little vax-jar.

Type of water	Resistance	Recorded file
Solar distilled	300 kΩ	STE-085.wav
Tap water	150 kΩ	STE-086.wav
Structured water	150 kΩ	STE-087.wav

8.4 Rain water [20062021]

Played with rainwater in a small wax-jar, resistance of the water 300 kΩ, recorded video with multimeter: iPhone IMG_2869.

8.5 Threshold value for electrolysis in water

To electrolyze water a voltage higher that 1.229 V is required.

8.6 Pine [18092021]

Played 2:00 p.m. with the same pine as 12-05-2016 (section 3.12, page 16) , instrument el piano2, recording with Bamboo device A major, 10 min.

The tree had many brown needles, the electrode was placed across three green needles.

Recording [STE-089.wav.]

8.7 Technical: MOPT voltage out [18092021-2]

Played with a 10 MΩ and a 0.1 MΩ resistor in series. When playing, the voltage across the 0.1 MΩ resistor was measured. See figure 42, page 78.

Old model: Setting L: 28 mV, setting H: 19 mV.
New model: Setting L: 29 mV, setting H: 20 mV.

Figure 42: Measurement of the output voltage of the MOPT.

This means, that the total voltage out is: Setting L: 2.9 V, setting H: 2.0 V.

8.8 10 MΩ resistor [18092021-3]

Played with a 10 MΩ resistor and the MOTP device on setting Hi. Instrument el-piano2.

After 30 sec. a long pause but the green LED was turned on.

In contrast a 10 MΩ resistor in series with water played in normal way for several minutes.

8.9 Hypothesis [18092021-4]

Inspired by the experiment in section 8.9, page 79. the hypothesis is:

When playing with water and an Arduino moisture sensor in series with a 10 MΩ resistor, the variation in the melody will be due to variations in the water as the resistor alone does not demonstrate variation in the melody.

8.10 Bamboo output voltage[18092021-5]

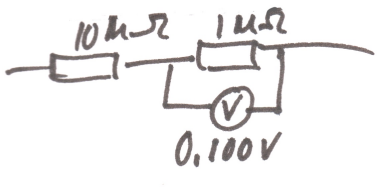

Figure 43: Measurement of the output voltage of the Bamboo device.

Measured the output voltage from the Bamboo device by measuring the voltage across the minor part of a voltage divider, see figure 43, page 79. The measured voltage across the 1 MΩ resistor was 0.1 V, which means that output voltage from the Bamboo was

$$V_{out} = \frac{10+1}{1} \cdot 0.1V \sim 1.1V.$$

8.11 High ohms resistors and water [29092021]

A. 22 MΩ carbonfilm resistor [H31005], recorded with the Bamboo device.

   It played 1-2 notes with intervals that were measured with an iPhone stop-watch:

   1) 12.35 sec.
   2) 15.08 sec.
   3) 15.58 sec.
   4) 16.73 sec.

B. 22 MΩ resistor in series with an Arduiono moisture sensor in tapwater,
   intervals between notes were measured:

   1) 3.76 sec.
   2) 8.24 sec.
   3) 3.29 sec.
   4) 10.29 sec.
   5) 11.60 sec.
   6) 8.82 sec.

   Conclusion:
   The pause between the notes are longer and therefore the variation in the melody is more lively with a resistor i series with water compared to the resistor alone.

C. 10 MΩ [Old type] Pause between notes:

   1) 16.61 sec.
   2) 15.70 sec.
   3) 15.10 sec.
   4) 14.18 sec.
   5) 15.30 sec.
   6) 8.42 sec.
   7) 14.36 sec.

D. 10 MΩ [Metal film], pause between notes:

1) 12.77 sec.
2) 15.01 sec.
3) 15.10 sec.
4) 14.87 sec.
5) 14.93 sec

E. 1 MΩ [Metal film, H22293], pause between notes:

1) 13.87 sec.
2) 14.87 sec.
3) 14.99 sec.
4) 15.80 sec.
5) 7.40 sec.
6) 8.84 sec.
7) 15.35 sec.
8) 12.58 sec.

8.12 Yellow rose leaf [01102021]

Played with a yellow rose leaf to investigate the water distribution property of the rose leaves. This property/effect should be the opposite as the property of lotus leaves, so that rose leaves distributes the water across the leaf.

Three recordings were made: one with a dry leaf, one with a wet leaf and one with a wet leaf with a quarts crystal on top of the leaf.

Recordings:
Dry: STE-090
Wet: STE-091
Wet + crystal: STE-092.

8.13 Beech [02102021]

Played with a beech, 4 p.m. the same beech played in the "Geopark - event" in the summer 2017, see section 4.28, page 54. Recording [STE-095].

8.14 Maple and Oak in Ulkerup forest[13102021]

1) Played with a Maple tree , recorded 2 $\times$ 10 min.
Recordings: [STE-094] and [STE-095].

   The maple played 3-5 sec. and then paused. When a person was standing by the steam of the tree, after some time the tree played more continuously.

2) Oak ("Teglværksegen"). Same tree as in section 4.32, page 55.
Recording: [STE-096].

   The oak played the same interrupted way as the maple. And again when a human stood for some time at the steam, a more continuous playing came about.

8.15 Talk and a demonstration in a high school [03112021]

Talk and a demonstration with 3 large potted plants indoors in a high school (Odsherreds Gymnasium). 30-50 onlookers in the age of 16- 19 years old.

The plants all played staccato bum, bum, di, du, da, dum, Bum bum.

A student proposed, that all should be clapping in the same way - all clapped for a few minutes - and afterwards the plant played more fluently.

The interaction had a clear effect.