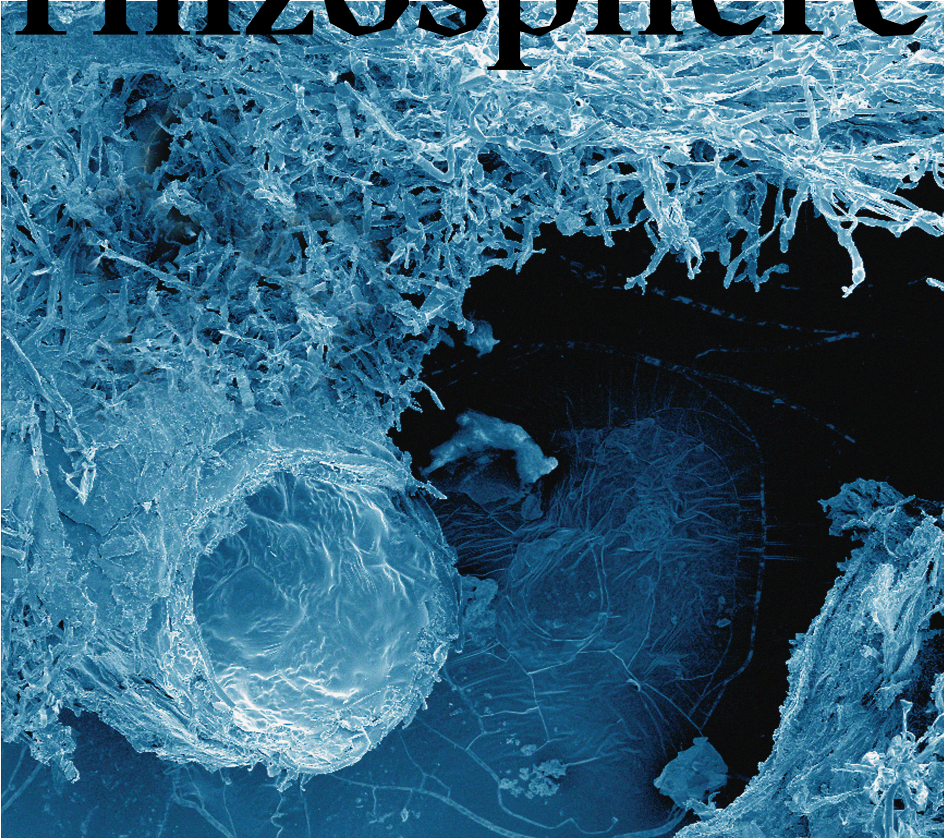


Luka Prinčič

rhizosphere



QUOTESNOTES

rhizosphere of roots:

the part of the soil with which they are in contact
and which hosts a great many other forms of life

ROBOSPHERE



REPUBLIKA SLOVENIJA
MINISTRSTVO ZA KULTURO



Mestna občina
Ljubljana



emanat

CONA

Luka Princič: 'Rizostera, izpiskizapiski',
prevod, lektura: Katja Kosi
grašno oblikovanje: Luka Princič
tisk, vezava: Maruša 'maruji' Hren
kuriranje, organizacija: Irena Pivka, Brane Zorman
produkcija: CONA, za galerijo Steklenik, 2020
koprodukcija: Emanat

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izvorna koda: lukaprinco.si/tag/rizosphere

sources:

BG: Brilliant Green, Stefano Mancuso and Alessandra Viola

CR: Composing Electronic Music, Curtis Roads

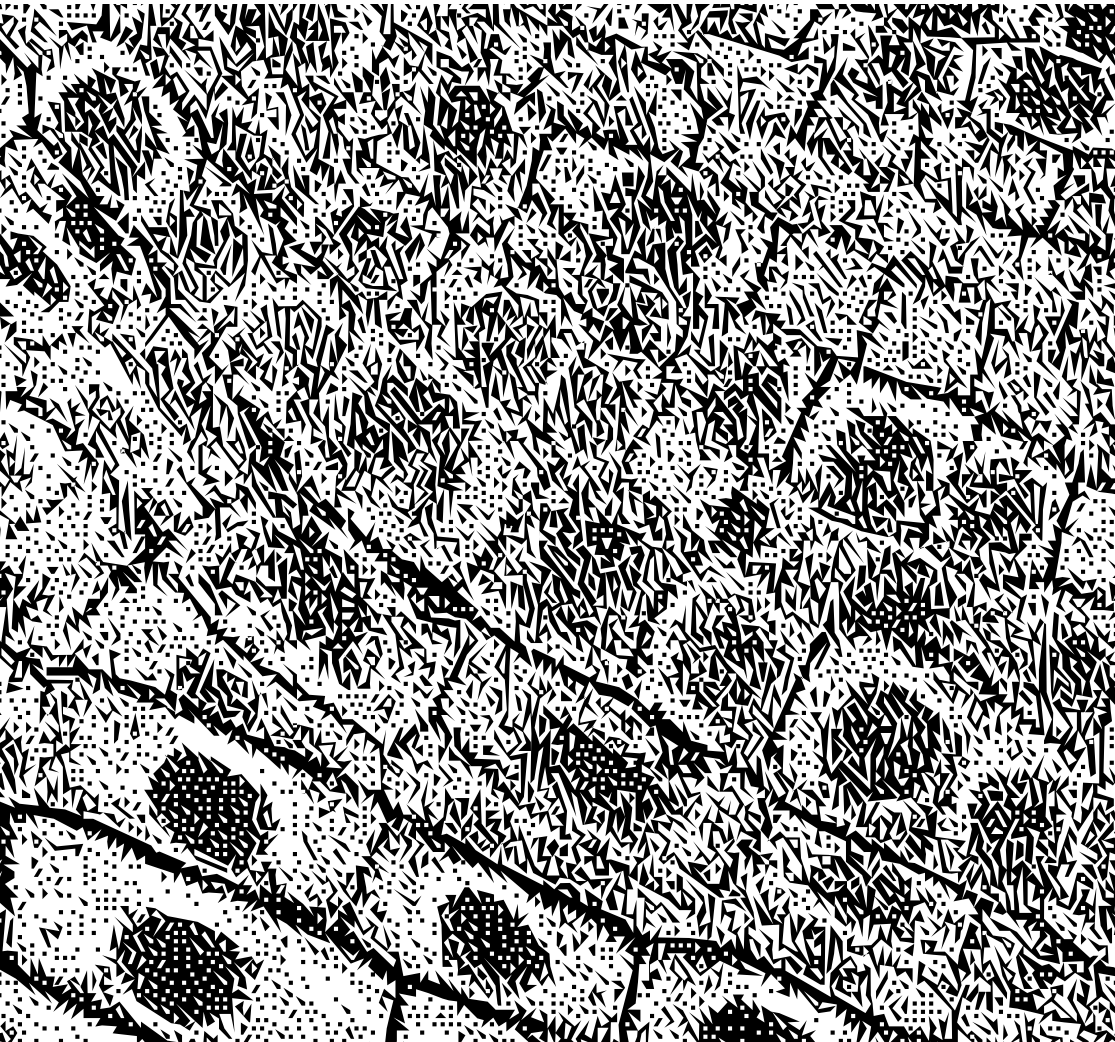
PT: Plant Theory: Biopower and Vegetable Life, J. Nealon

RA: Dewayan Psychology in Plant Intelligence and Research:
Transforming Stimulus and Response, Ramsey Affifi

TC: The Conversation - Explaining Chaos Theory

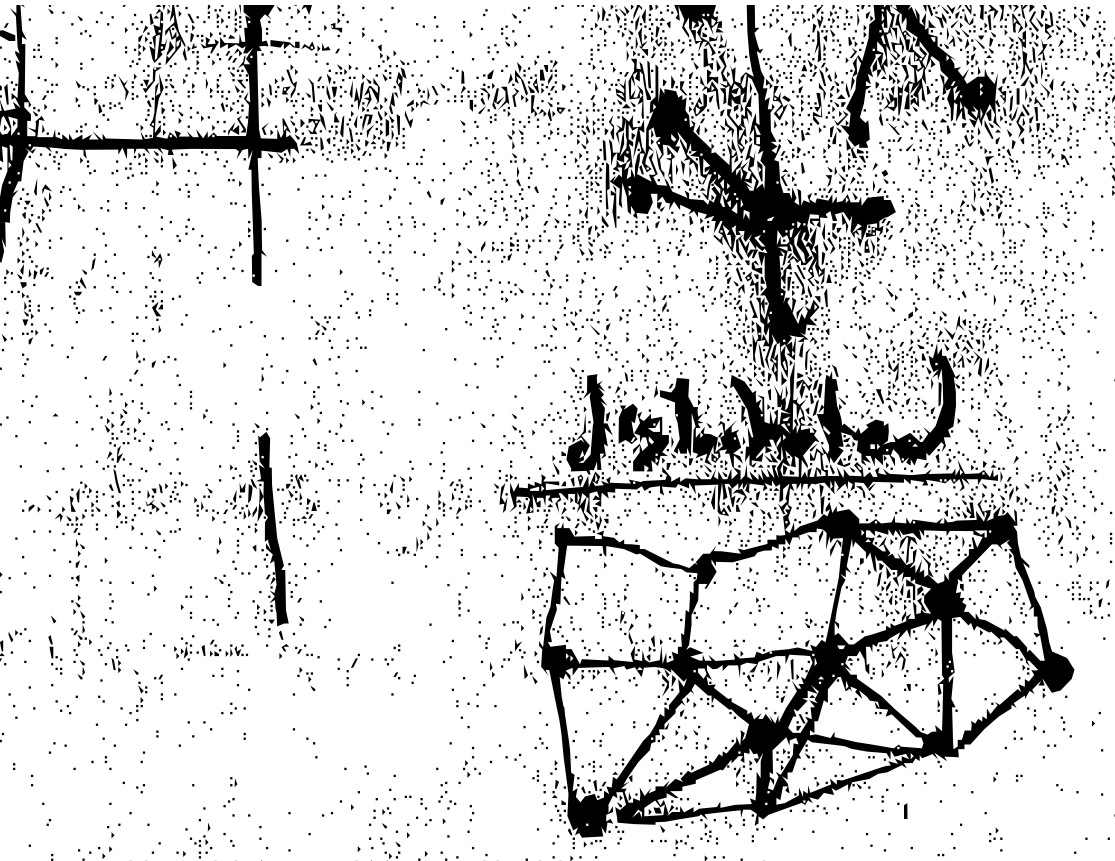
UG: The Word for World is Forest, Ursula K. Le Guin

WP: Wikipedia

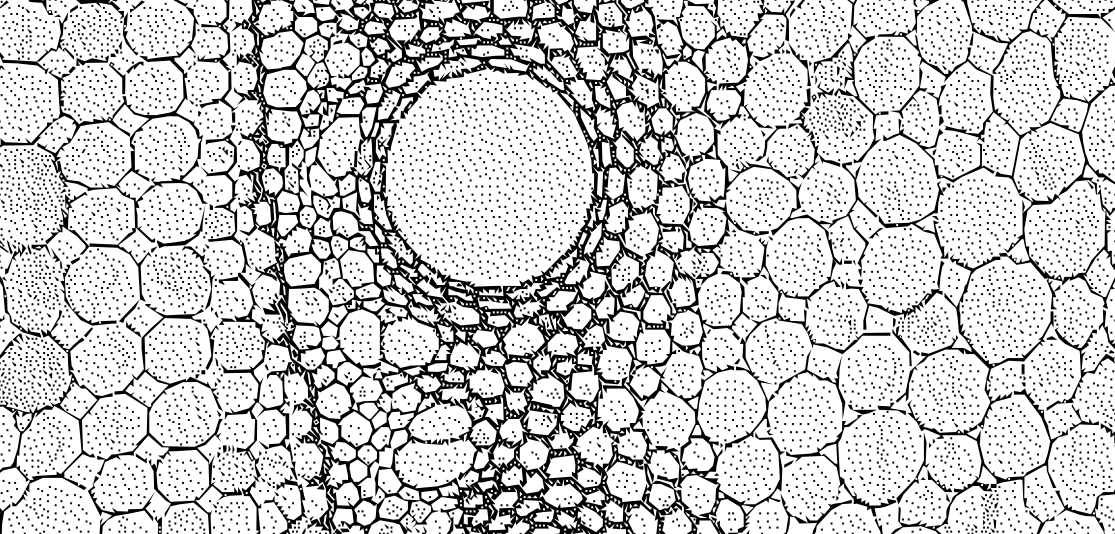


Kajti korenine so sanje.

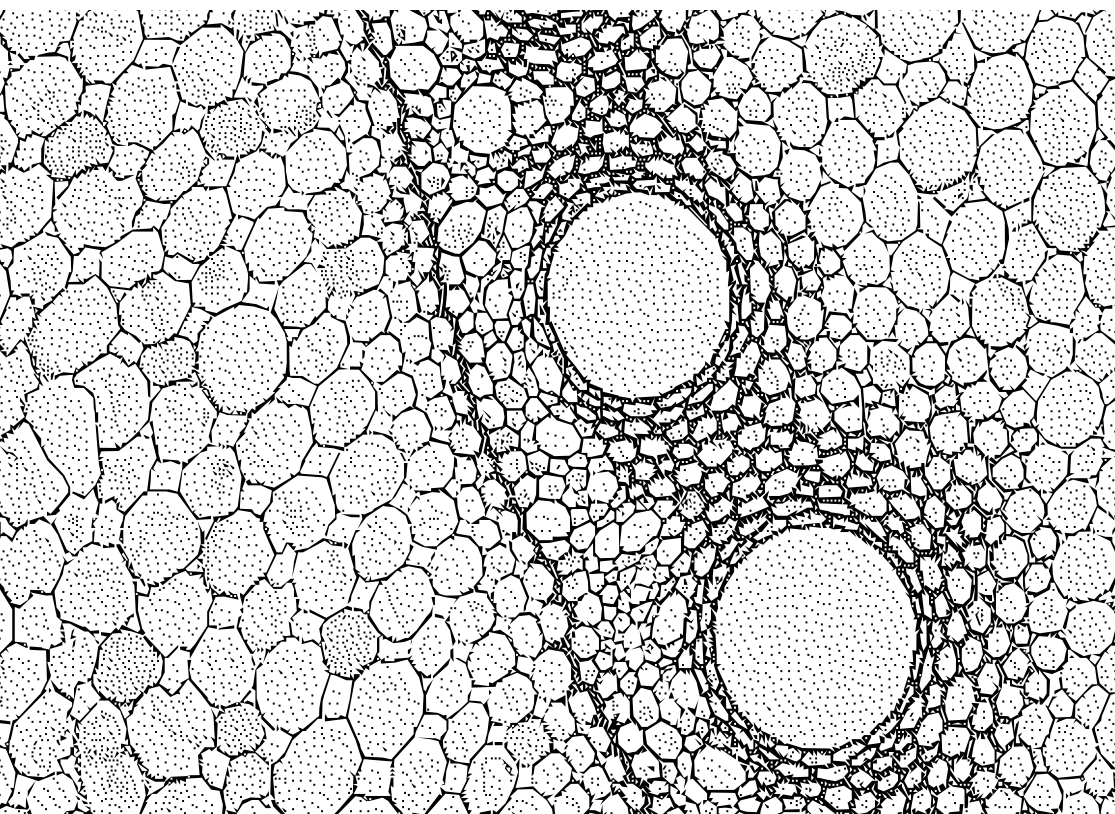
(09)



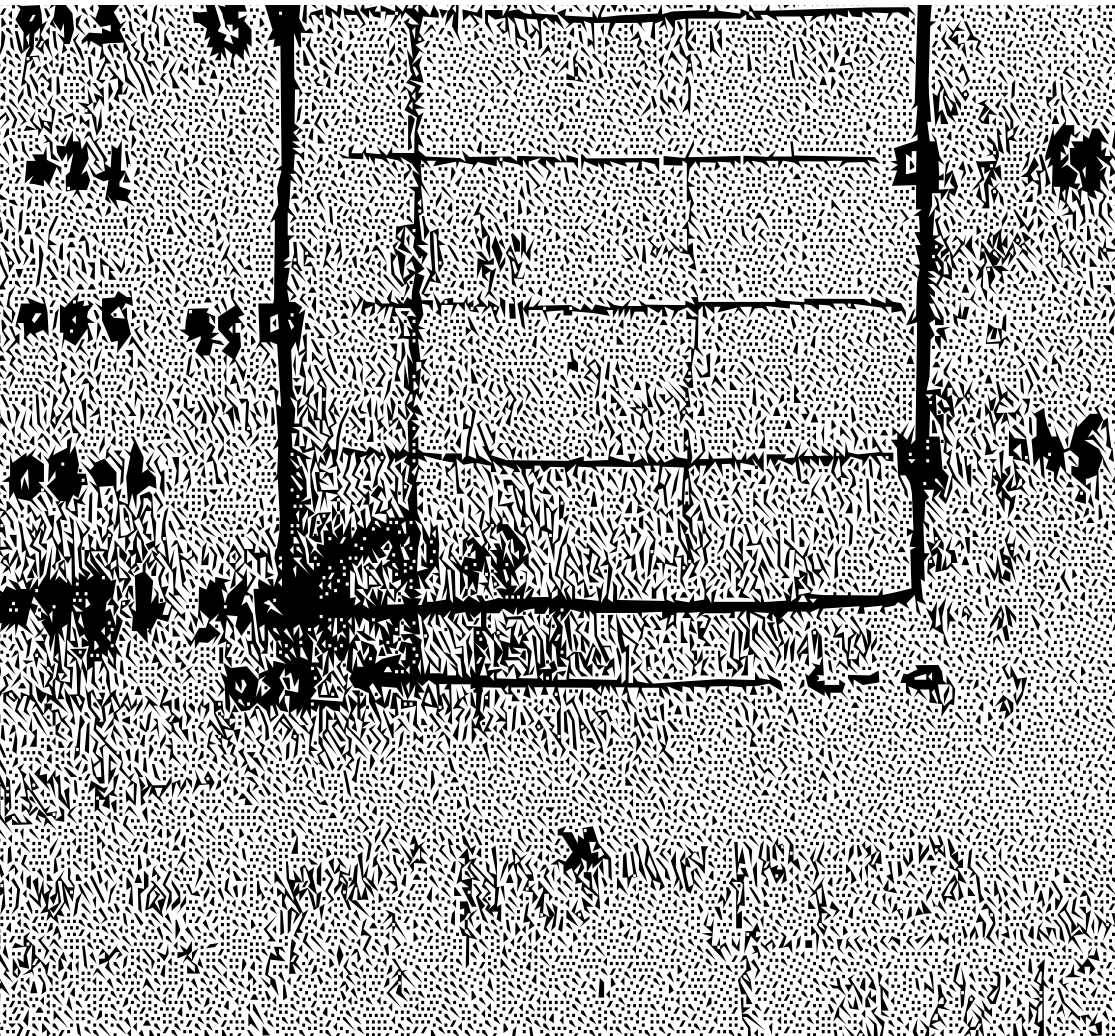
Was sha'ab [...(god, numinous entity, or powerful being, but also translator)...] one who could translate into waking life the central experience of vision: one serving as a link between the two realities, considered by the Athsheans as equal, the dream-time and the world-time, whose connections, though vital, are obscure? A link: one who could speak aloud the perceptions of the subconscious. To 'speak' that tongue was to act. To do a new thing. To change or to be changed, radically, from the root. For the root is the dream. (UG)



... namenjati posebno pozornost učinkovanju
oblasti, ki odseva v številnih praksah, zaradi
katerih se dejansko razlikujemo od ostalih
življenjskih oblik, ter premisliti, kakšne oblike
naslaja tovrstne prakse neizogibno prinesejo. (P7)



...plant intelligence needs to be considered as a teleological activity, whereby the plant organizes and coordinates itself and its environment in a goal-based way. If plant biologists follow behaviourist (and cognitivist) psychology in reducing intelligence to mechanisms of the mind, they risk repeating the dementalization of the organism that was inherent in behaviouristic animal theory. (RA)



Compositional / generative tools

CYCLES

(not vegetation)
Recycle in art loops
in nature
Green Key

GROWTH OF

Roots

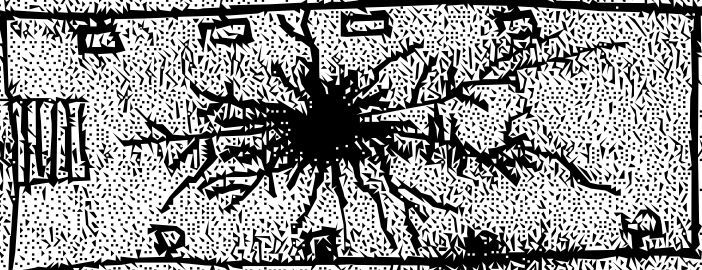
→ SLOW TRANSITION
OF Meso-sound
TO Meso-sound
(length of granules)

GRANULAR SYNTH.

→ DEATH & DECOMPOSITION

Rastline so posrednice med soncem in zivalskim svetom. Rastline - oziroma zanje znaini organell, kloroplast - predstavlja vejni člen med organskim svetom (tem, kar imenjemo zivljenje) in energijskim centrom nasega soncega sistema. Rastline imajo torej univerzalno funkcijo za zivljenje na nasem planetu. Zivall take funkcije nimajo. (BG)

SPATIALISATION (out-plants)



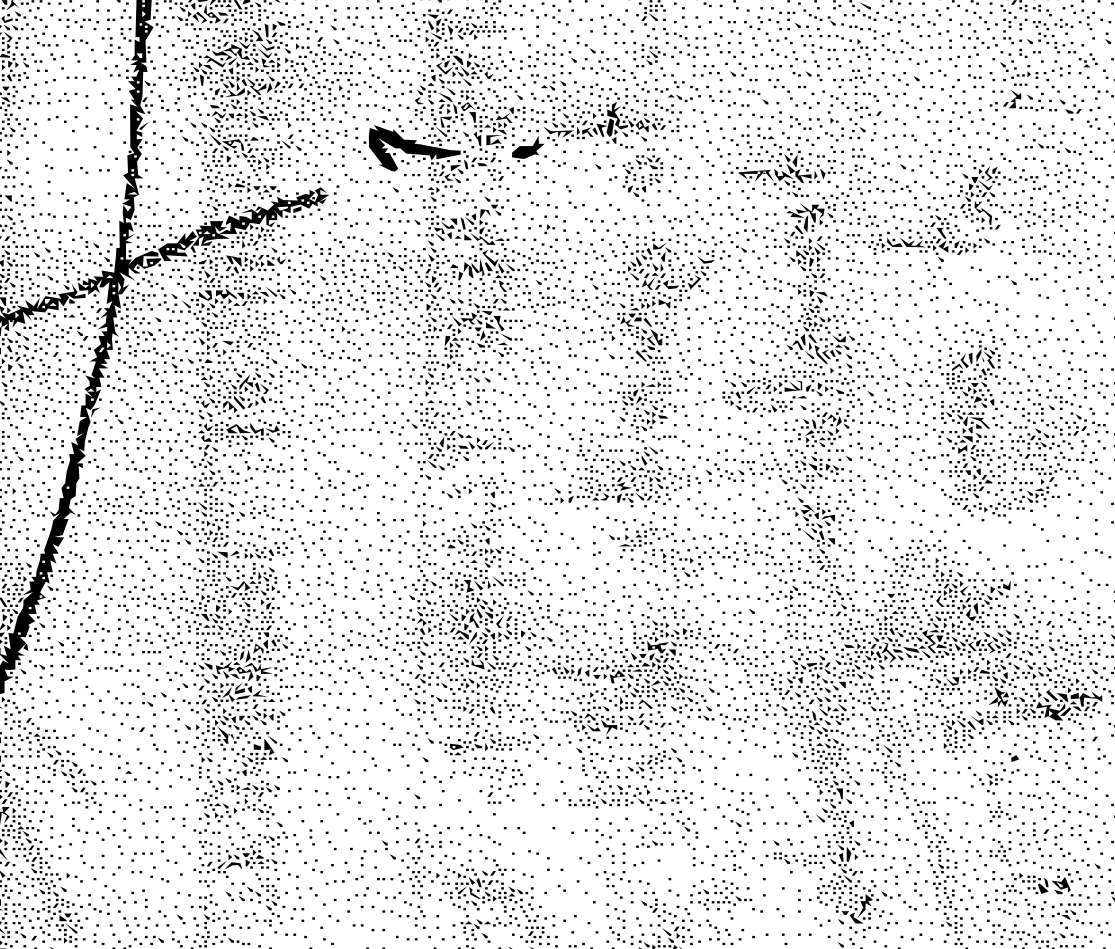
Darwin wrote and affirmed several times that he considered plants to be the most extraordinary living things he had ever encountered (“It has always pleased me to exalt plants in the scale of organised beings”) (BG)

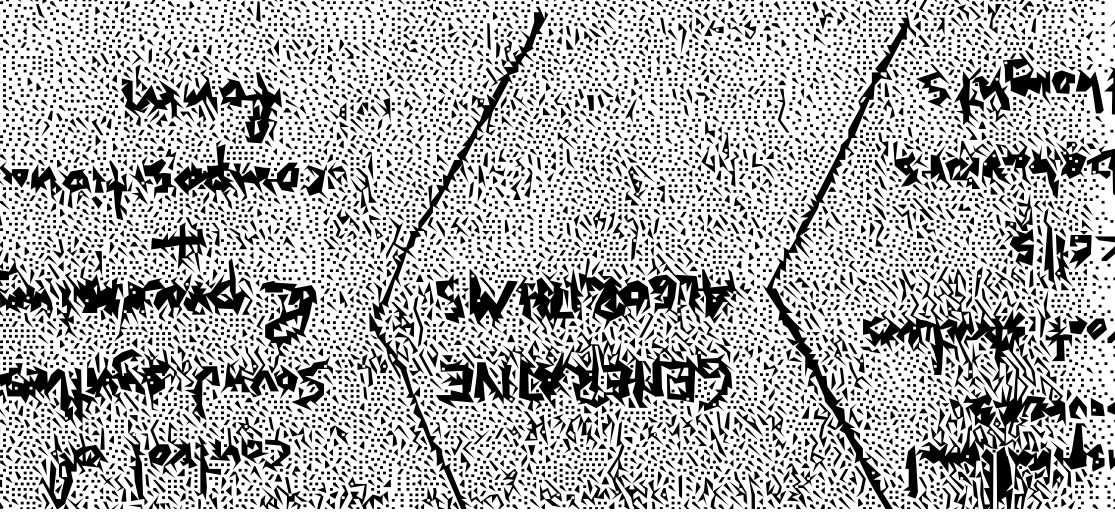


[Za Delenza in Gattarija] rizom (med drugim) deluje
proti interpretaciji, proti razumevanju sveta kot
zaporedja skritih možnosti. (PI)

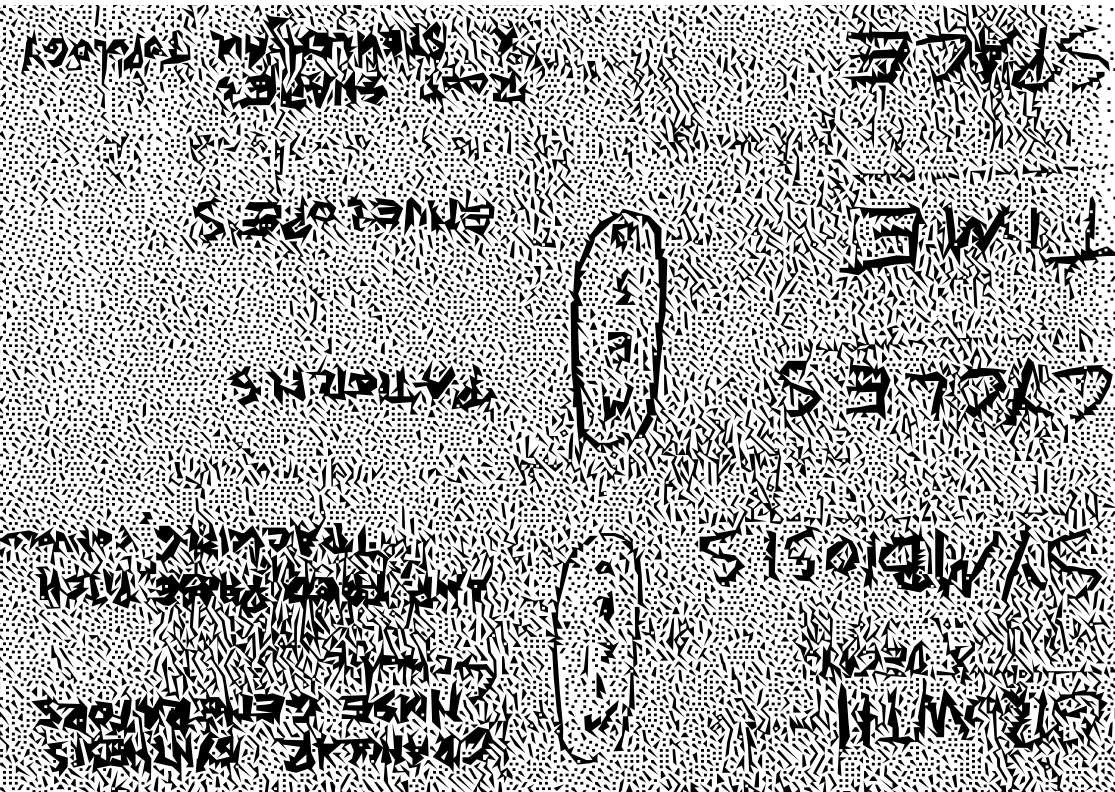
root
cap

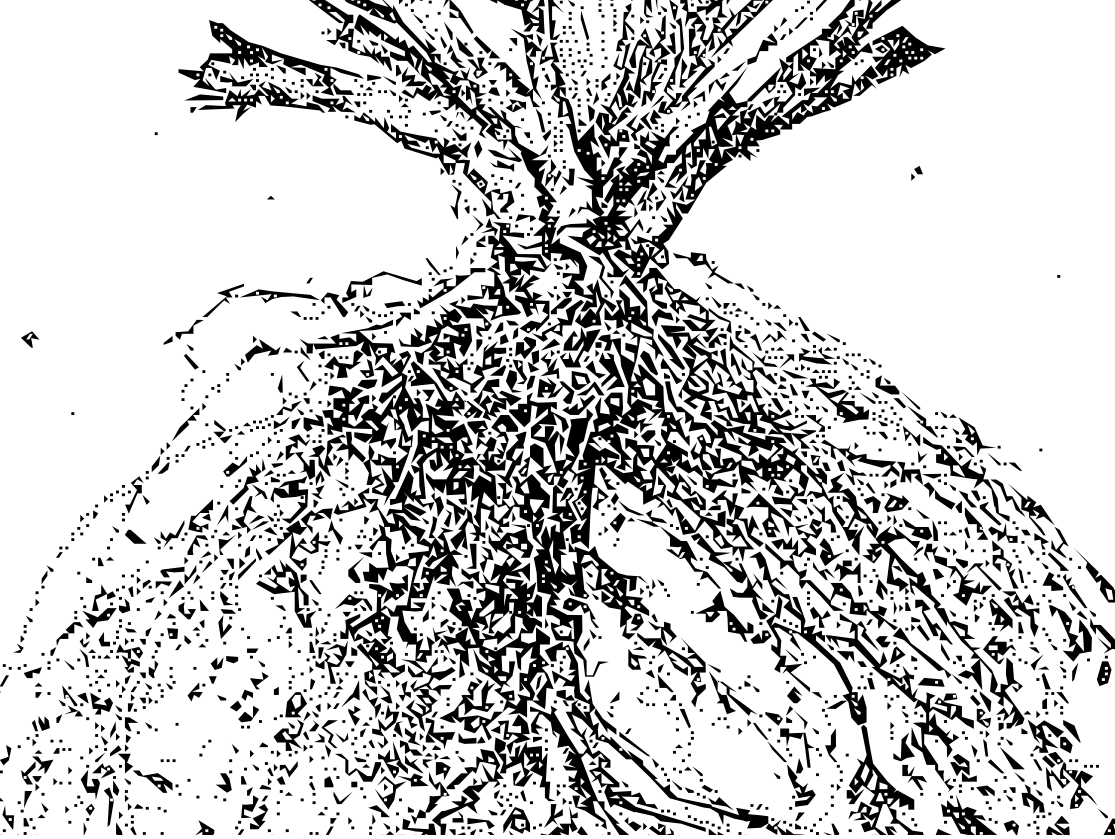
tree





... the assumption that mechanism is sufficient for understanding - or exposing - the mind is questionable ... the mechanistic (physicochemical) reduction of mental phenomena is no longer about intelligence at all. (RA)

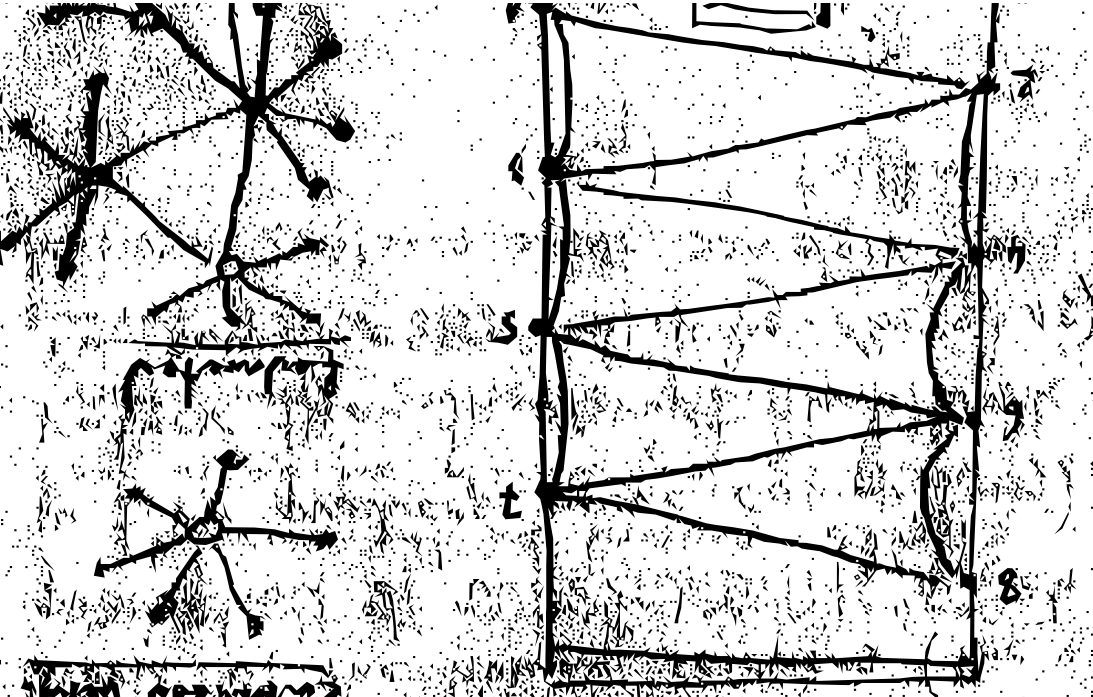




Viage 1 (1956) Luca Ferrarja bi bilo
treba obravnavati v smislu ciklov in ne
ponavljanja... Gikle sem si predstavljajal
kot individuum, ki živijo pri drugacnih
hitrostih. Ce se niso srecali, je to
pomnilo, da so samostojni. Ce so se, sta
jih sprememila ucinokovanje ali soodenje. (GR)

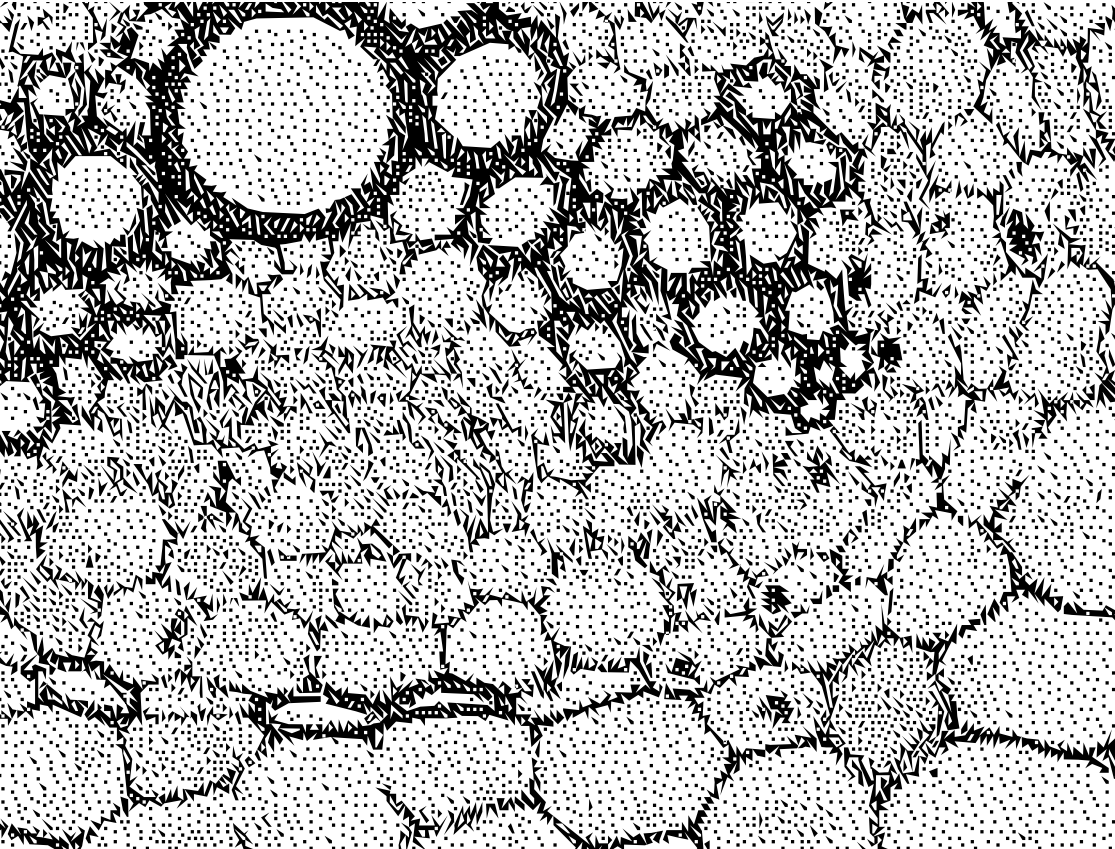


Plants' bodies are constructed in a modular design, in which each part is important but none is truly indispensable ... if we cut a plant in half, the two parts can still live independently, for the simple reason that a plant isn't an individual. In fact, the right way to think about a tree, a cactus, or a shrub is not to compare it to a human being or any other animal, but to picture it as a colony. A tree is much more like a colony of bees or ants than an individual animal. (BG)



INTELLIGENT
 (of adverbs)
 STRATEGIC
 ↑
 - of roots
 DISTRIBUTED

Inteligence rofa (angl: swarm intelligence, krajshe (SI) je kolektivno obnasanje v decentraliziranih in samo-organiziranih sistemih, ki so lahko naravni ali umetni. SI sisteme obicajno sestavlja skupina preprostih agentov oziroma bodov, ki so v interakciji med seboj in z okoljem. Tovrstni sistemi so pogosti v naravnih bioloskih sistemih. Posamezni členi sistema delujejo v skladu s preprostimi pravili in deprav ne obstaja centralizirana nadzorna struktura, ki bi narekovala njihovo obnasanje, pa lokalne - in do doloene mere naključne - interakcije med posameznimi členi privedejo do vznika „inteligentnega“ obnasanja celotne skupine, ki pa je posameznim agentom neznano. Primeri inteligence rofej v naravnih sistemih so denimo mravljišča, jate pticev in rib, lov orlov, grede različnih živali, rast bakterij ter inteligence mikrobov. (WP)

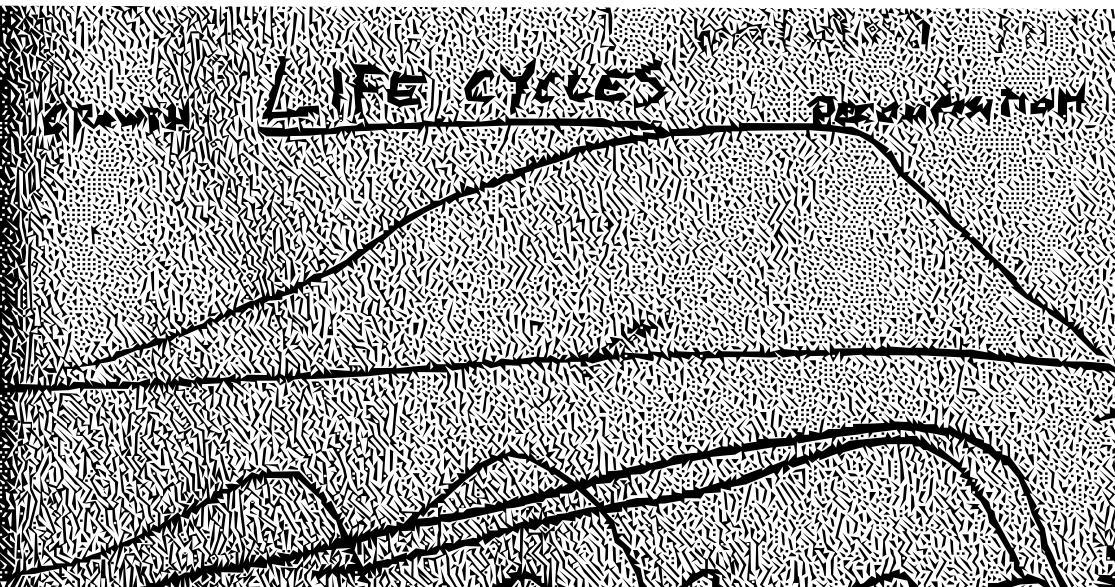


A teleological view [implies] the emergent capacity to goal-set at the system level through feeding back and integrating component interactions in ways that adjust the organism favourably towards needed ends. We need a naturalistic concept of teleology that can be used as a theoretical resource to explore and expand upon our understanding of intelligent behaviour across the biosphere. (RA)



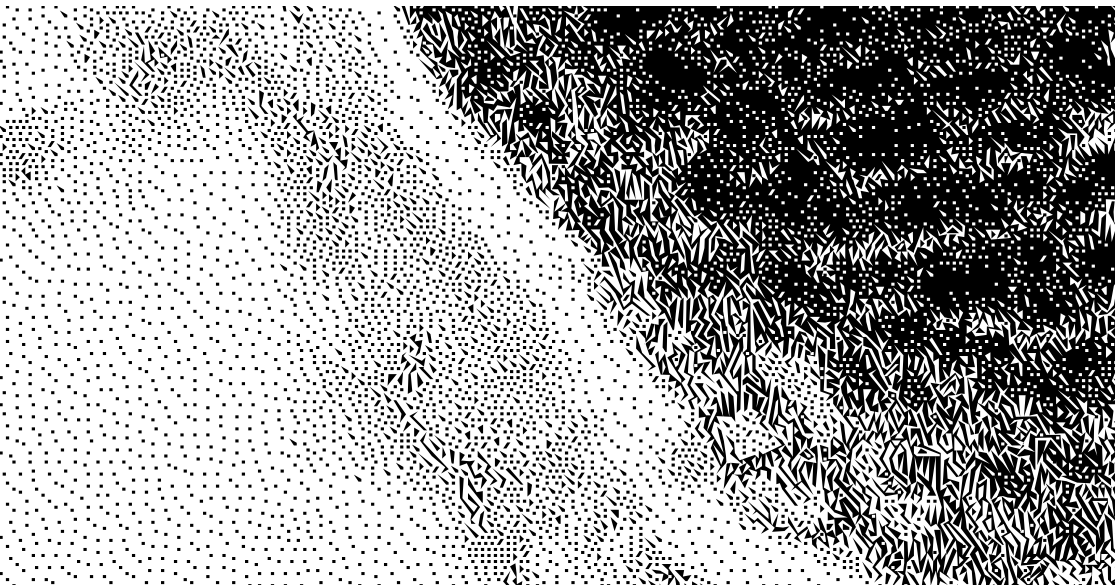
Vsaka rastlina je kot roj.

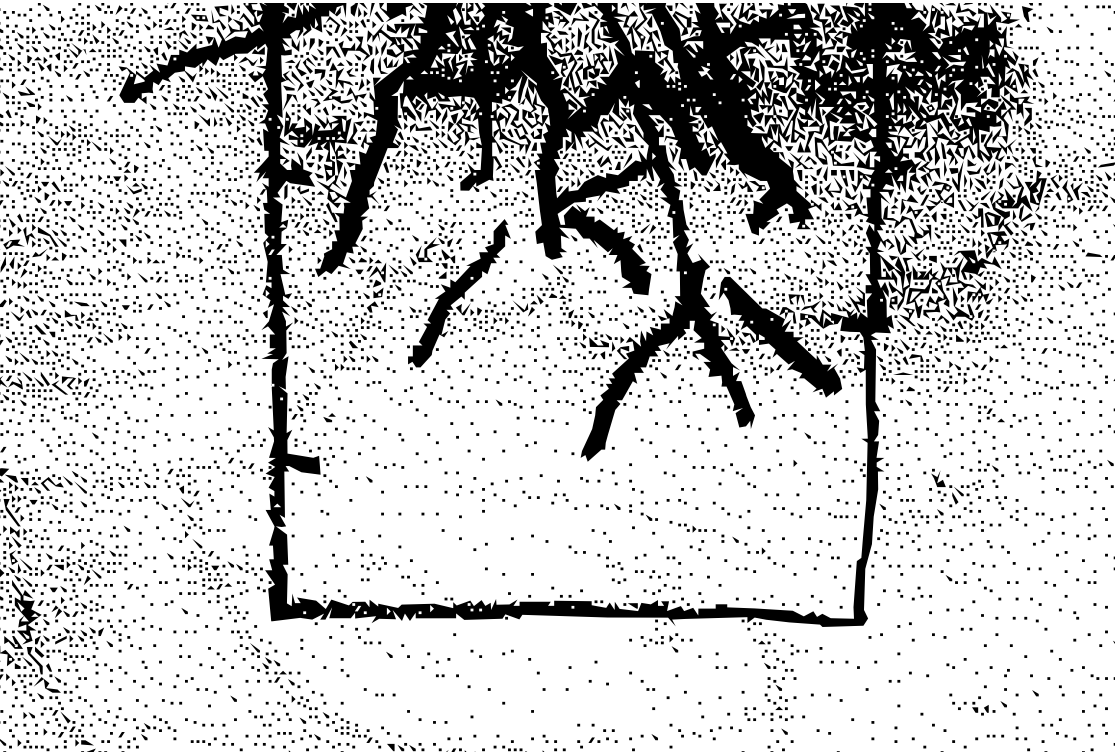
(BG)



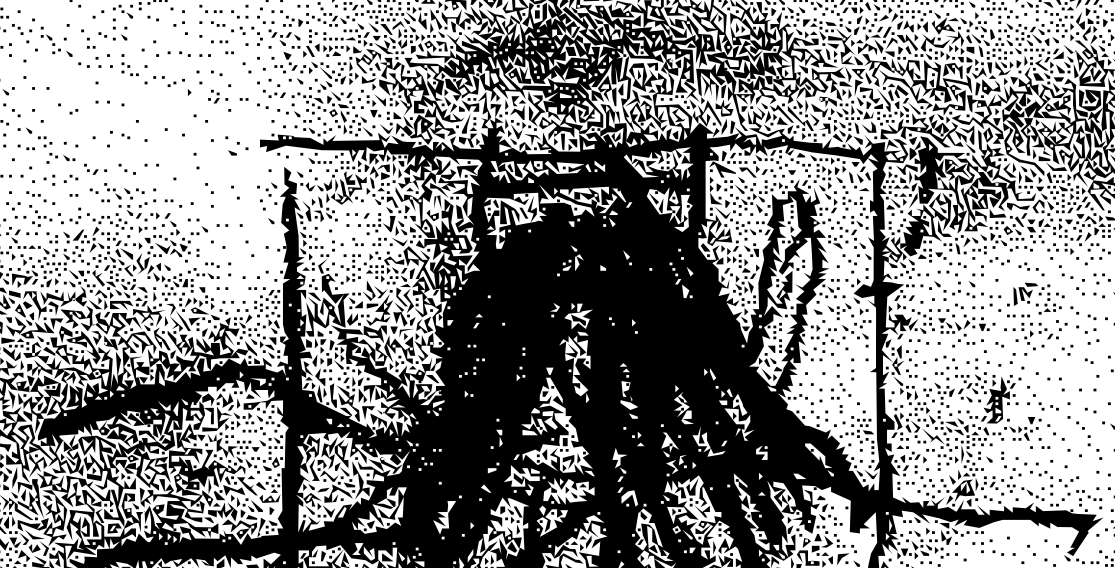


“The plant is the connecting link
between the earth and the sun.”
(Kliment Timiryazev [1843–1920]) (BG)





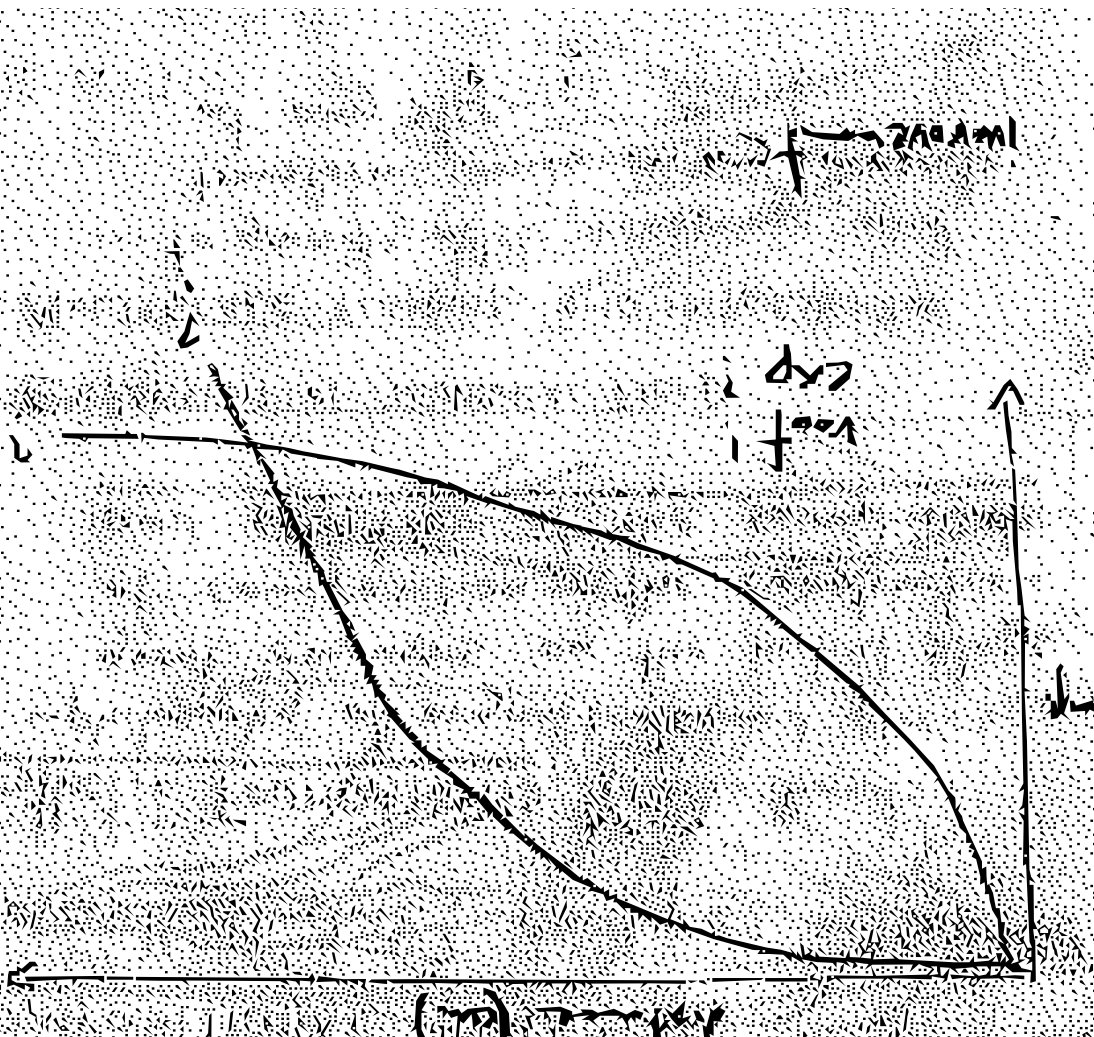
Koreniški vršček je izjemno prefinjen čutilni organ. Tako prefinjen, da ga ne bi mogli zaobjeti noben avtomatiziran odziv. Vsak vršček je [...] 'center za procesiranje podatkov'; ne deluje samostojno, temveč znatraj milijonske mreže drugih, ki sestavljajo koreniški sistem rastline. (Bj)



↓
out

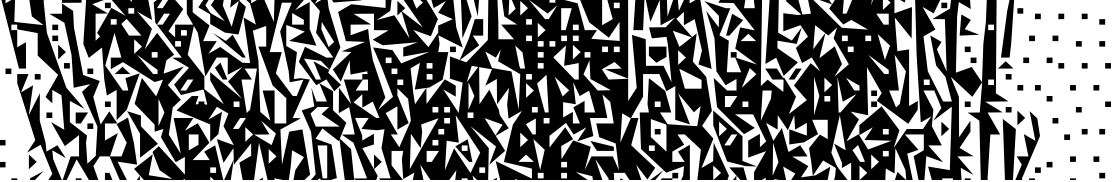
...the behaviourism's father, Watson, [said]: "in a system of psychology completely worked out, given the response the stimuli can be predicted, given the stimuli the response can be predicted."

There is no room in the behaviourist model for contingent decision making, choice, experimentation, context, or purpose. Plant research should avoid repeating this mistake... (RA)

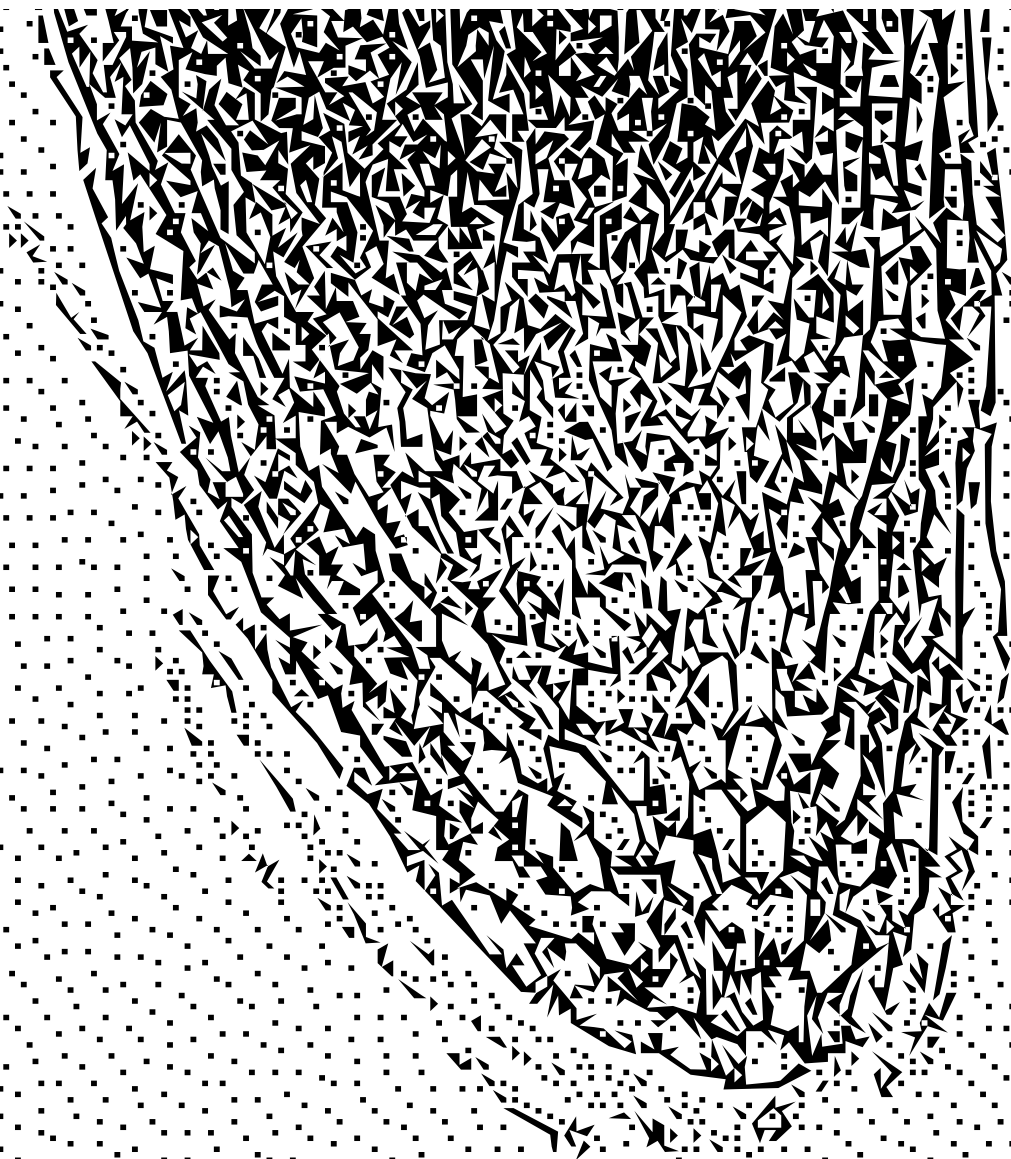


Koreninski sistem se tako majhne rastline ima lahko preko 15 milijonov koreninskih vrstikov. (BG)





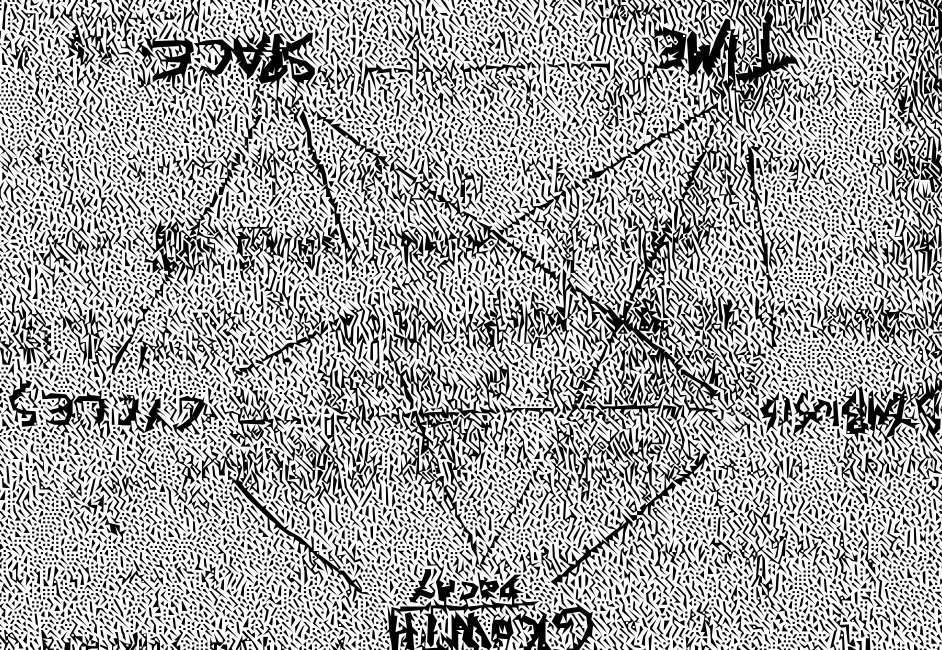
The calm that pervades us in [the presence of plants] may be the echo of an ancestral awareness that everything we need and every chance of survival dwells in the green world. Now as long ago. (BG)



Fontanil trdi, da z nastopom humanistike ob rojstvu biopolitike živali ni izključena ali pozabljena, kvečjemu nasprotno: živalskost postane prevladujoč aparat za proučevanje tako vprašanja, kaj je živiljenje, kot tudi kaj proizvaža. Živete ni več zgolj nastlinstvo (priraščeno in čakaajo kategorizacija), ampak se ga razume kot razvijajoče se, podrejeno apetitu, skrivnostno, nekontinuirano, lažljivo, nedoumljivo, vedno na preži in v iskanju vrzeli, skoz katere se bo osvobodilo. „Živiljenje je s tem, ko je preneslo svoje skrivno bistvo iz rastlinskega na živalski svet, zapustilo tabelarni prostor reda in znova postalo divje.“ (PT)

ŽIVILJENJE


When searching for mentality within life, we should be looking beyond mechanism, a paradigm which sees only the algorithmic consequences of fixed conditions-be it fixed conditions in organism or environment. We should instead be on the lookout for cases where living processes 'restructure or redefine' organism/environment relationships-and are restructured and redefined in turn. (RA)





Najbolji partnerji rastlin so mravlje; medsebojna pomoč in spoznavalni sistemi med temi kozkralci in rastlinami vedno znova navdušujejo znanstvenike. (BG)





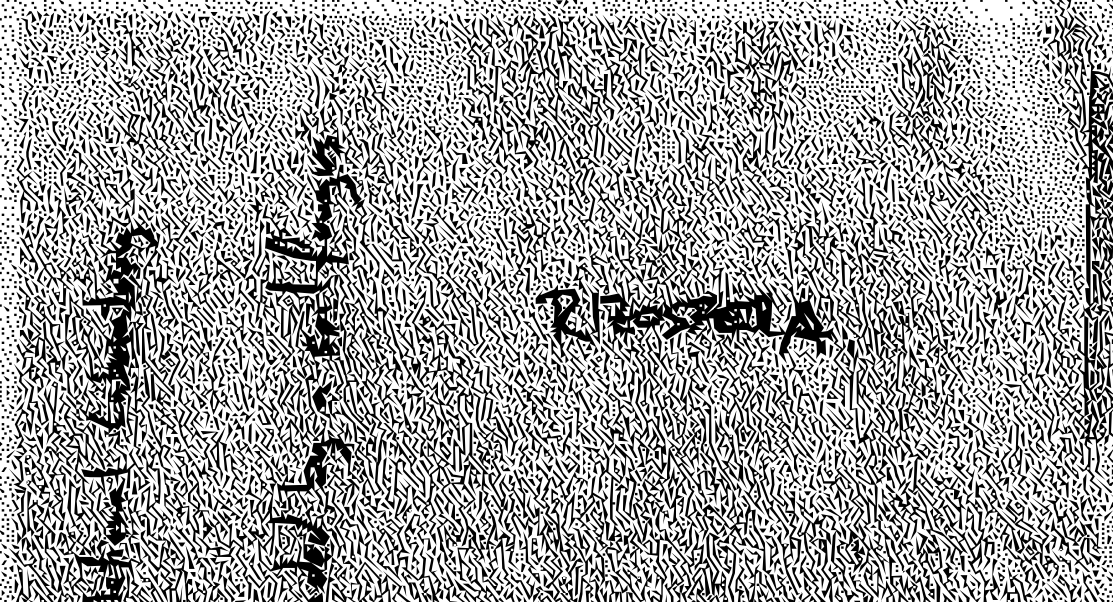
More recent experiments on the hypogeal (below the soil surface) rather than the aerial part of the plant have shown that the roots perceive a much broader range of sound vibrations, and that the vibrations perceived can influence the direction of root growth, according to movement called 'phonotropism' (Greek phonos, 'sound', and trepein, 'turn'). (BG)



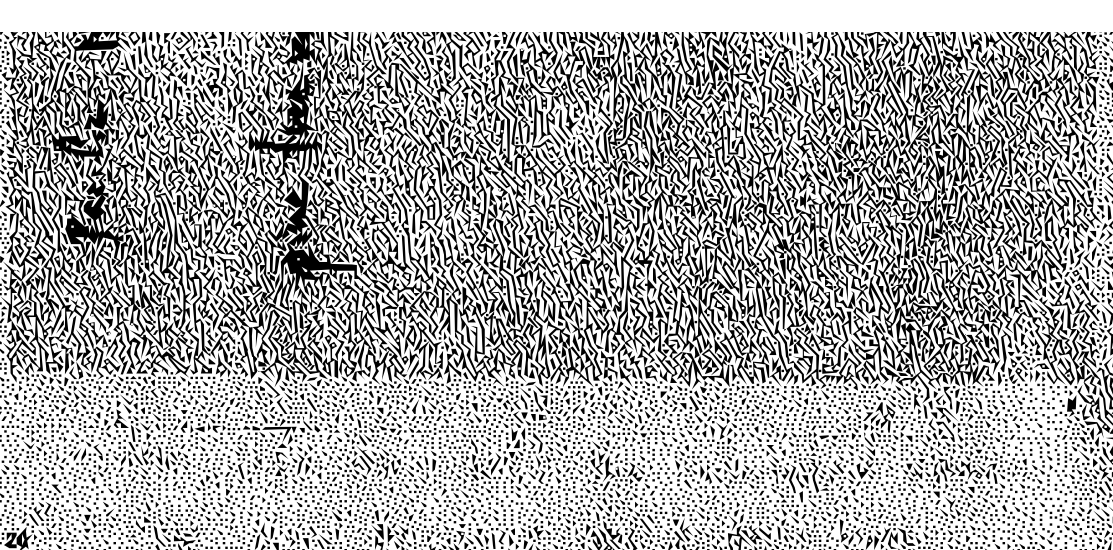
PEROMP

ES

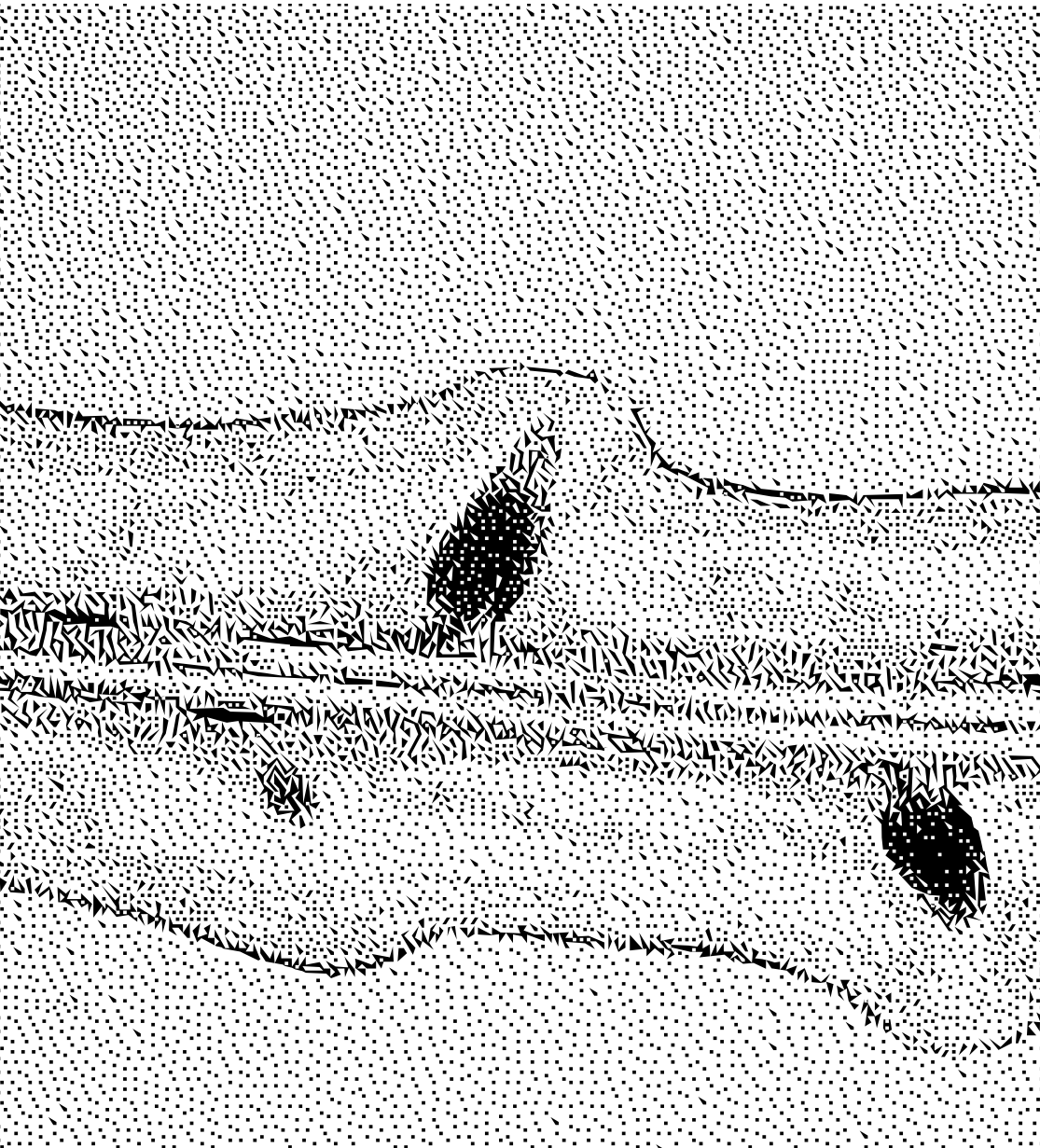
The main hormones (intrinsic stimuli) and respective pathways responsible for root architecture development include:



Ce teleološki razvoj sistema razdelimo na več delov, in zanje odgovorna namembnost, obenem pa ga zreduciramo na sistem, ki deluje mehansko in v skladu s preprostimi vzročnimi povezavami. (RA)

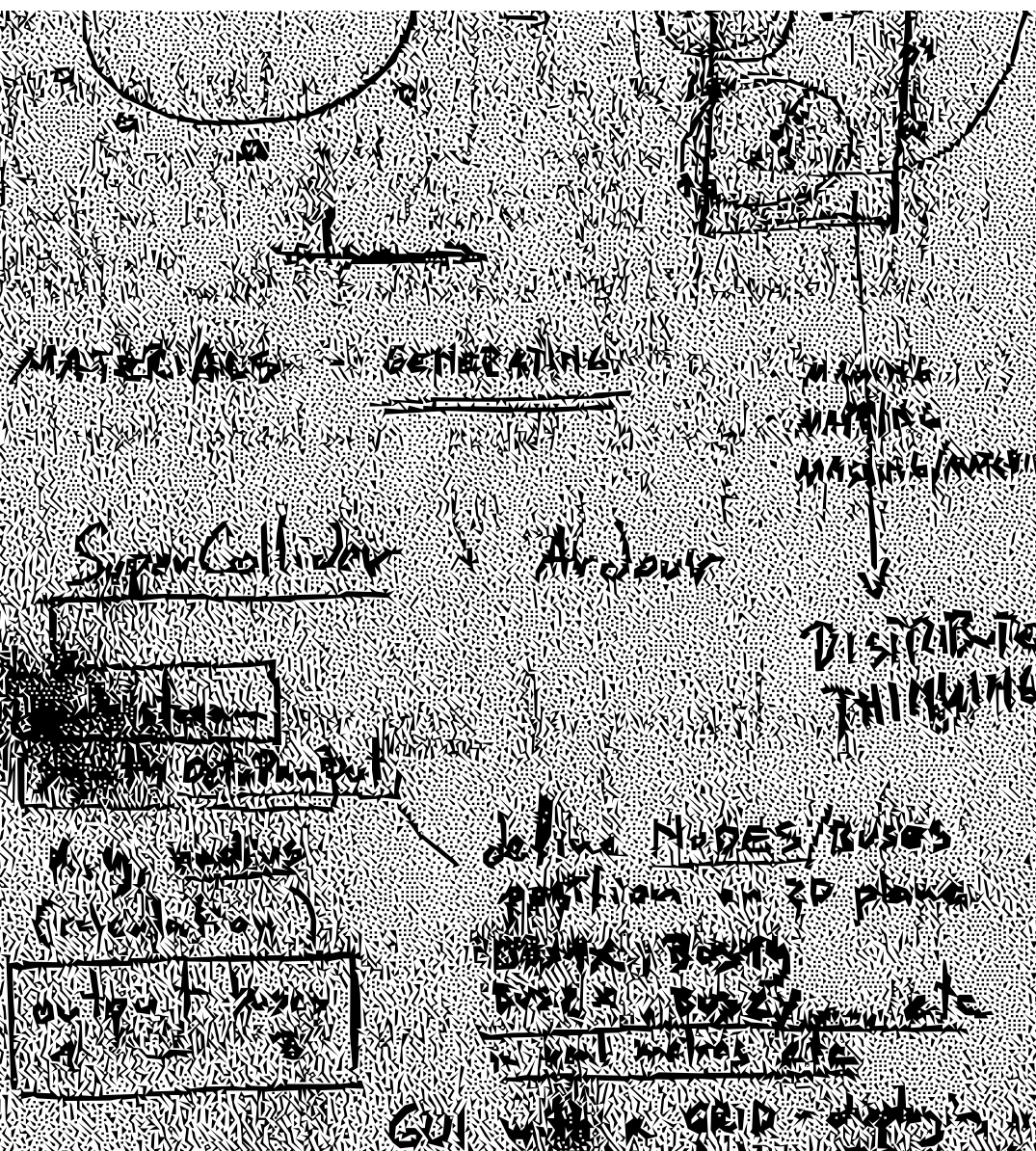


“Environment and organism are not separate factors but aspects of one function - one process, one coordination, one life, one experience.”
(Pearce, 2014) (RA)



SCHEMATIC CONSIDERATIONS

... Atshtëant so pokrajine in kraje pojmenovani z zvenecimi, dvoizlozimi besedami: Sornol, Tuntar, Eshreth, Eshsen, Endtor, Abtan in Athsne, kar je pomenilo gozd in hkrati svet ... Za Athsneane substanca sveta ni bila zemlja, temveč gozd. Zemljant so bili ilovica, rdeč prah. Athshtëant so bili veja in korenina. (UG)





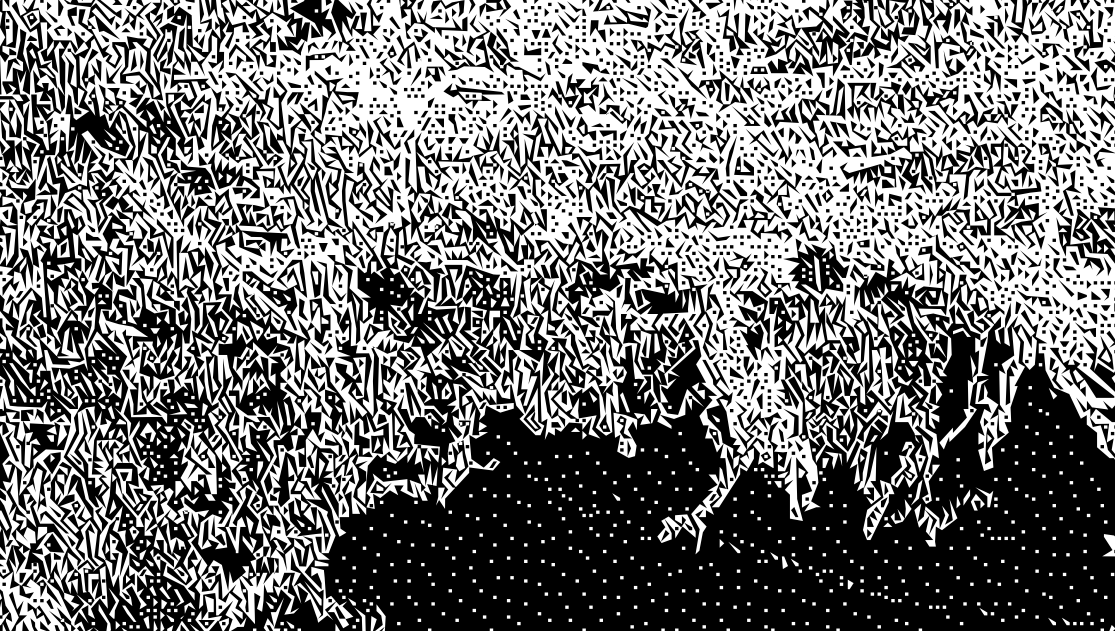
GROWTH

DECAY

(BG)

Plants'
intelligence
is
distributed.





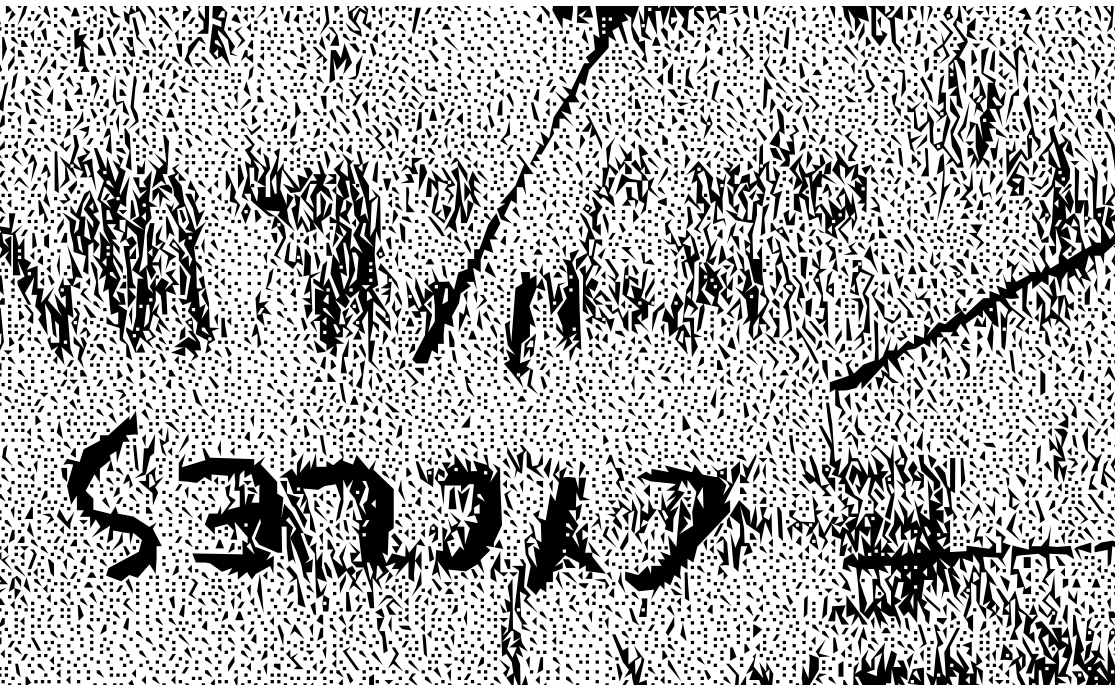
glasbeno morfološko. (GR)

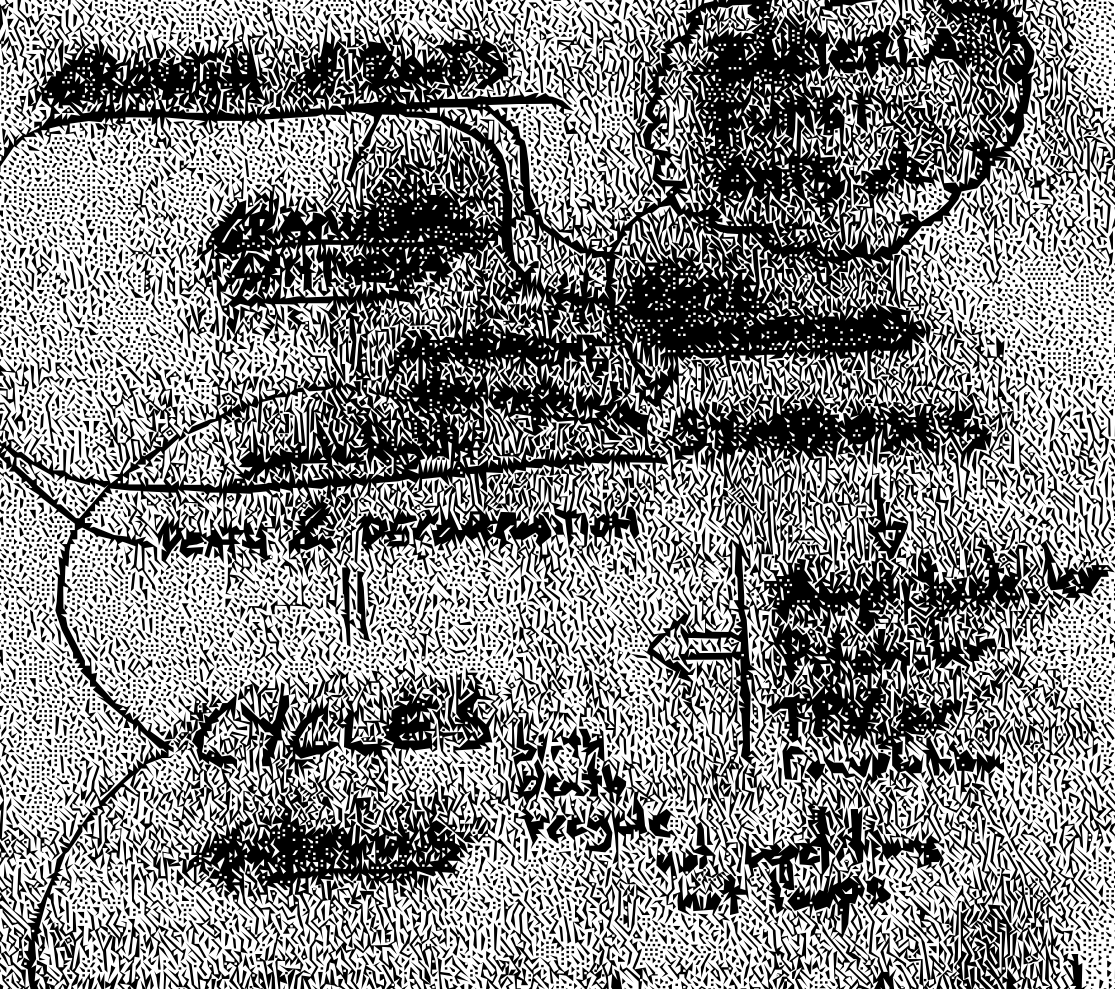
V procesu kompozicije gre v bistvu za ustvarjalno
odločanje: kaj ali dol, dolgo ali kratko, kako
ali redko, glasno ali tiho, isto ali različno,
kdaj ali kdaj ne, kaj ali kaj ne, kaj ali kaj ne
in urejeno v časni ter tako ustvarimo neke vrste





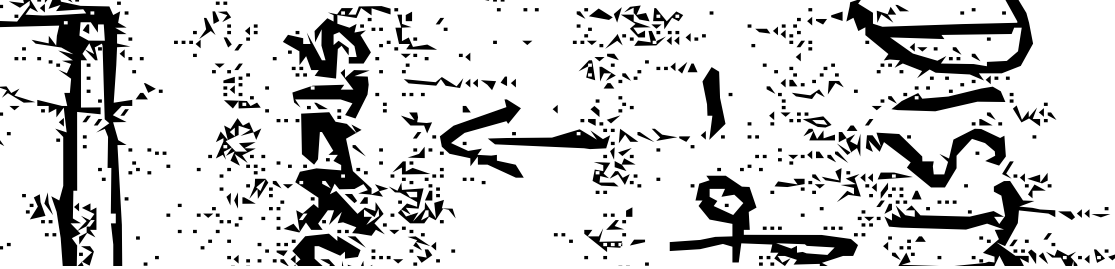
Chaos Theory has turned everyone's attention back to things we once thought we understood, and shown us that nature is far more complex and surprising than we had ever imagined. (TC)



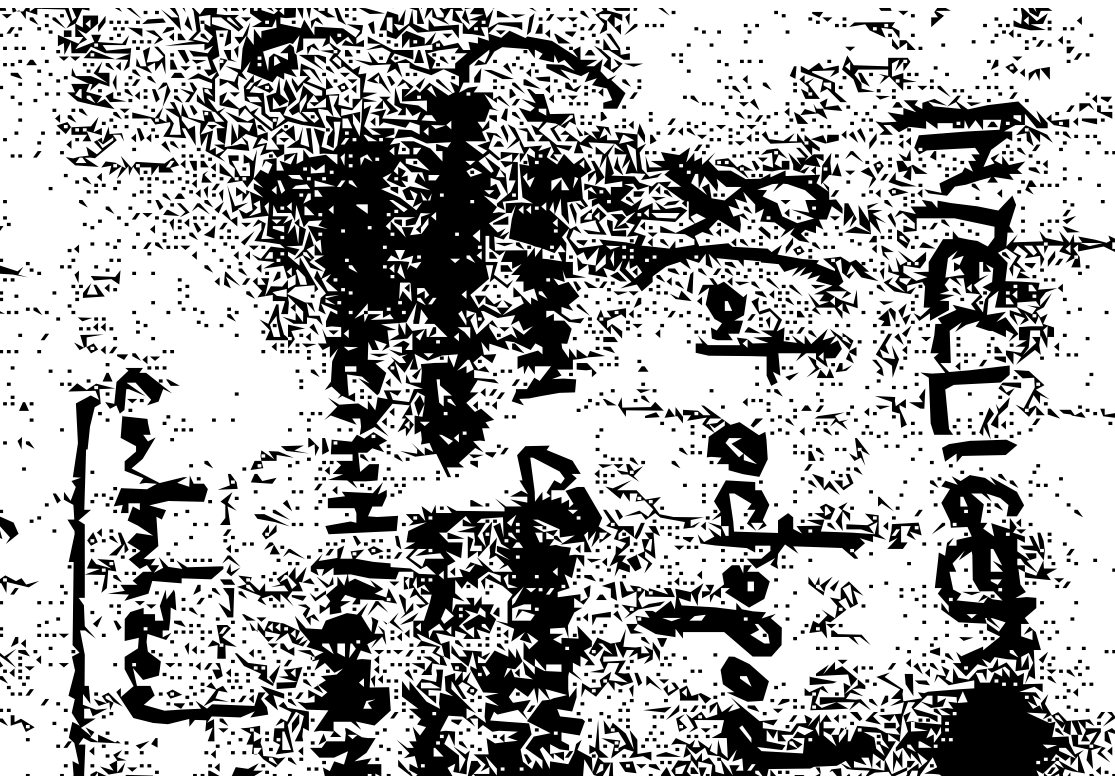


Po mojem mnenju ima pri teorijah in raziskavah o inteligenci nastlin pomembno vlogo tudi družbena dimenzija. Številne študije so pokazale na obstoj tako znotrajvrstne kot tudi medvrstne komunikacije med rastlinami in drugimi organizmi. Če tovrstna komunikacija nekaj pomeni, potem bi pritrakovali, da bo imela določen vpliv na nadaljnje transakcije in na to, kako rastline vzpostavljajo in se odzivajo na dražljaje. To pa zahteva dodatno raven analize: na kakšne načine rastline vzpostavljajo in se odzivajo na dražljaje, če jih ne obravnavamo v izolaciji, temveč če njihove cilje dolocajo znotrajvrstne in medvrstne interakcije? (RA)

Handwritten text at the bottom of the page, partially obscured and difficult to read.



I think that the social dimension is also crucial in plant intelligence theory and research. A number of studies show intraspecies and interspecies communication between plants and other organisms. If this communication matters, then it is expected that it would inform subsequent transactions through modifying what and how these plants constitute and respond to stimuli. This would involve an additional level of analysis: in what ways are stimuli and responses constituted by plants, not merely by their teleological activity when considered in isolation, but through the ways in which their goals are shaped by semiotic intra- and inter-species interactions? (RA)





Teorija kaosa je usmerila splošno pozornost nazaj k stvarjem, za katere smo mislili, da jih razumemo, in obenem pokazala, da je narava dosti bolj kompleksna in presenetljiva, kot smo si kadarkoli predstavljali. (TC)

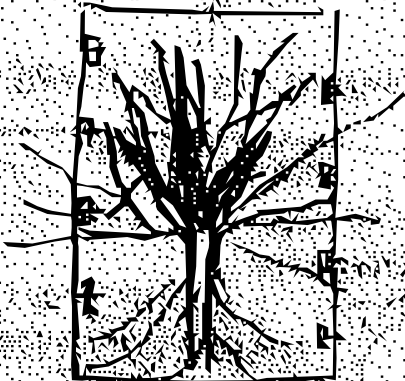


5

The process of composition is essentially creative decision-making: up or down, long or short, sparse or dense, loud or soft, same or different, etc. Out of a universe of possibilities, we choose specific elements and order them in time to construct a musical morphology. (CR)

Amplitude
TPY or (FFT) (Hz)

~~SYMBOLS~~

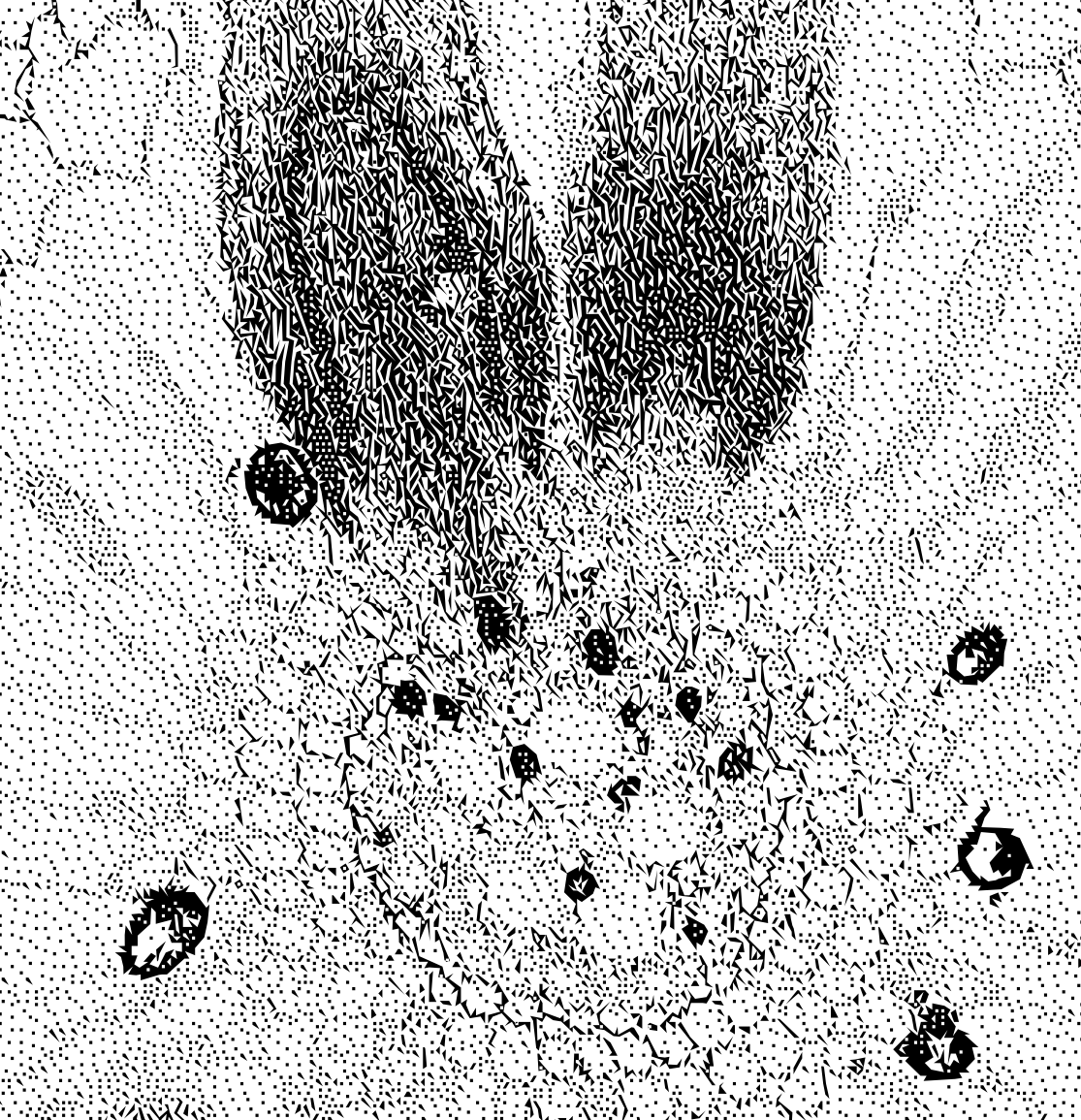


GENERATIVE

Intelligenza
je
rastim
distribuirana.

(BG)

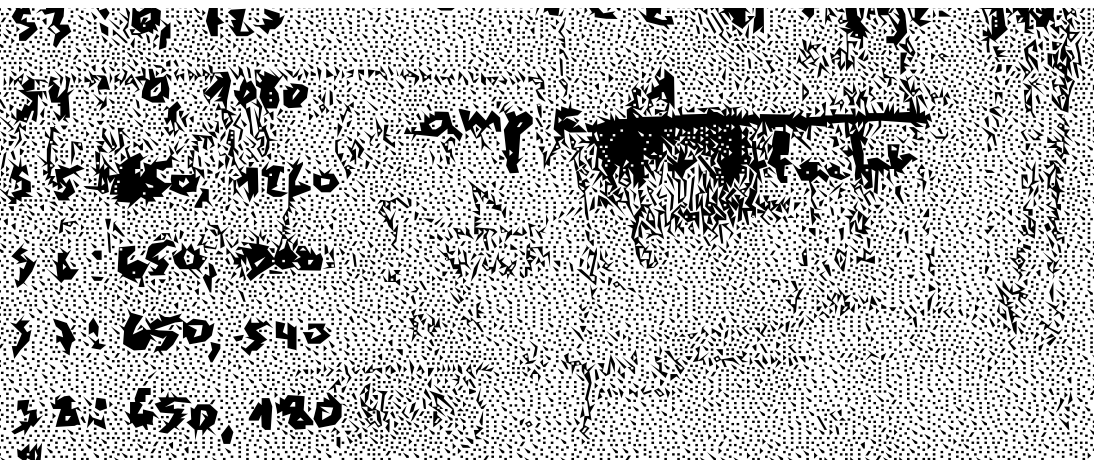


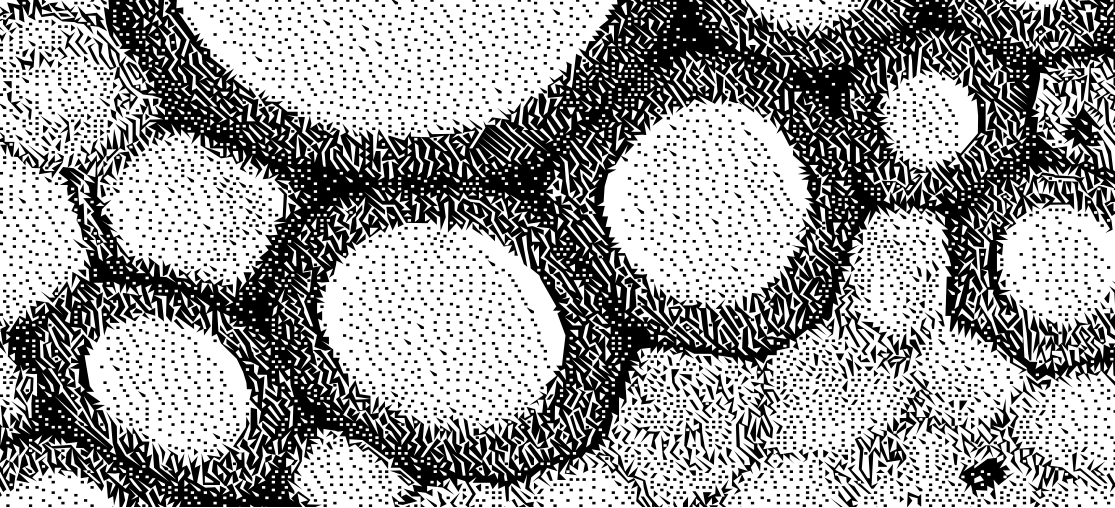


... Athshean's names for their own lands and places, sonorous two-syllabled words: Sornol, Tuntar, Eshreth, Eshsen, Endtor, Abtan, and above all Athshe, which meant The Forest, and the World ... to the Athshehans the substance of their world was not earth, but forest. Terran man was clay, red dust. Athshean man was branch and root. (UG)

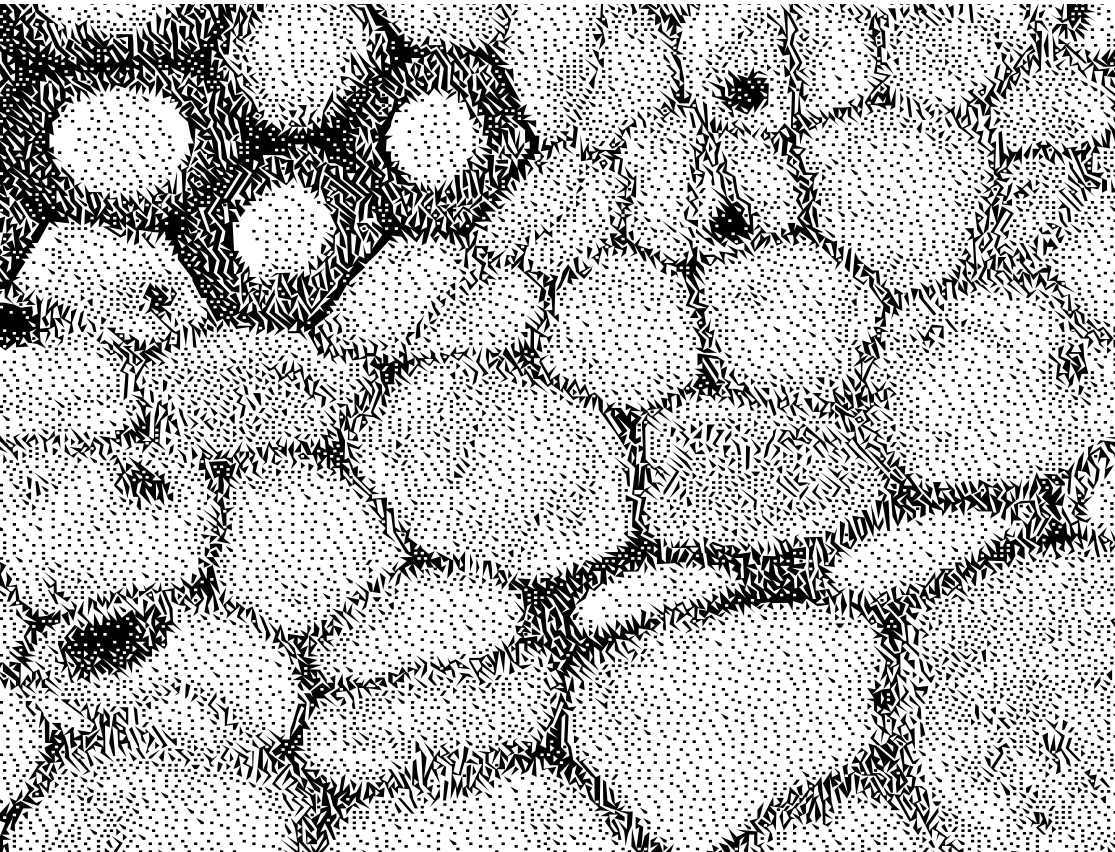


"Okolje in organizem nista loena dejavnika,
 temveč vidika ene same funkcije - enega
 procesa, enega usklajevanja,
 enega življenja, ene izkušnje."
 (Pearce, 2014) (RA)





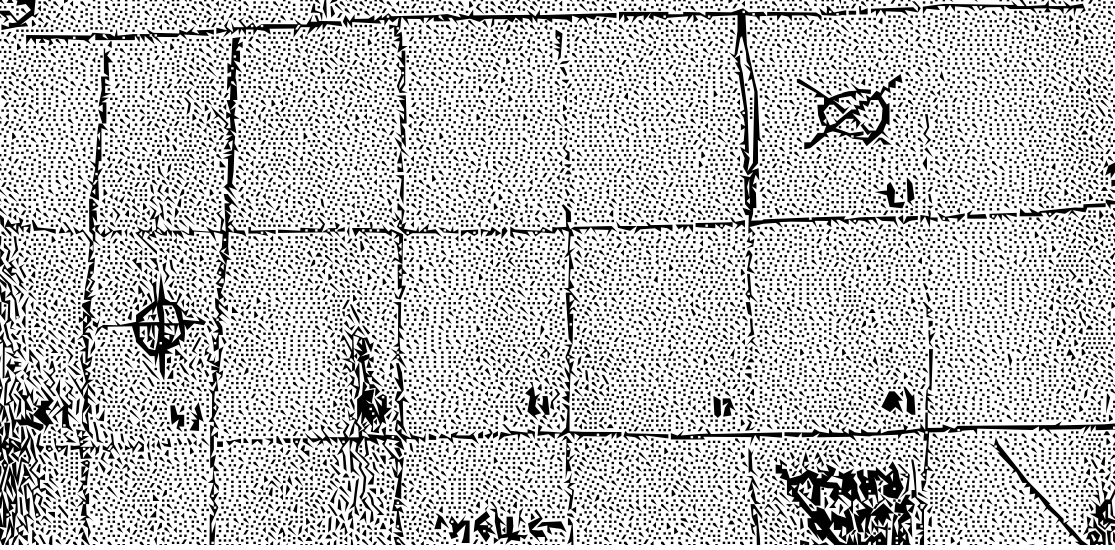
When teleological development of the system is cut into parts, its purposefulness disappears, and it is reduced to a system that operates mechanically according to simple relations of cause and effect. (RA)



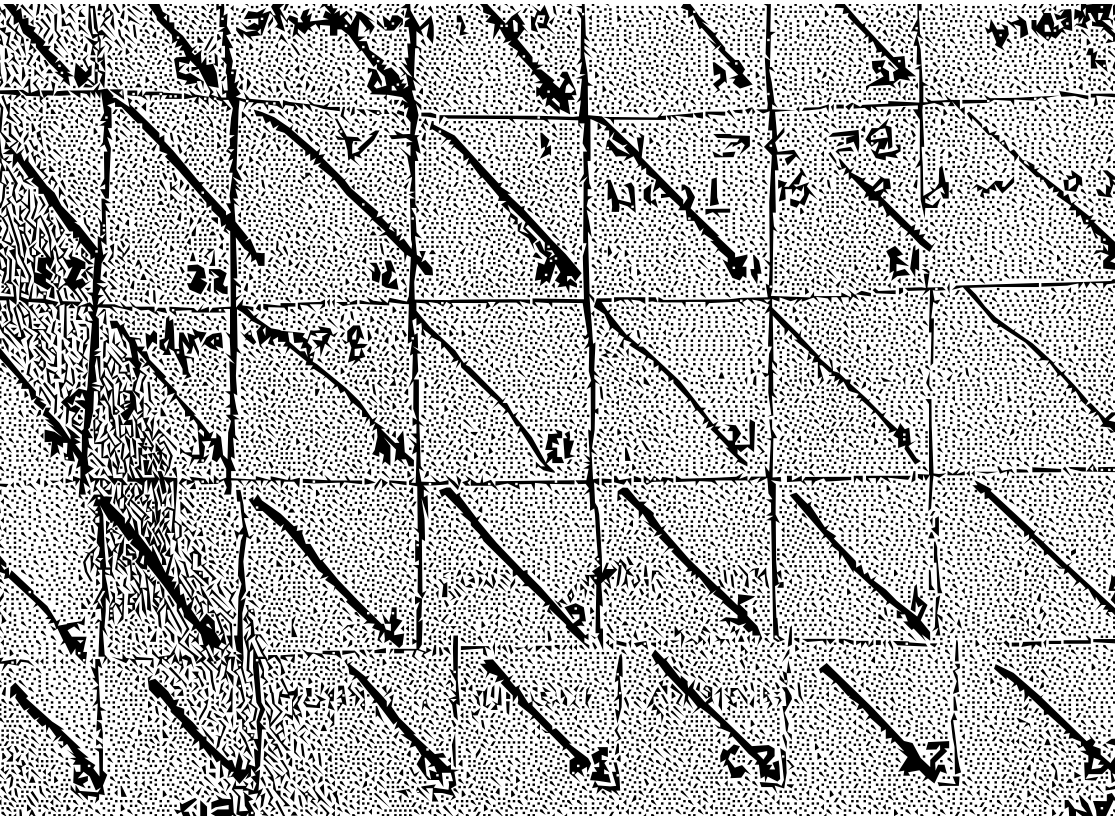
GRANULAR SYNTHESIS
Noise Generation
→ Chaotic
AND OTHER THINGS

Nedavne raziskave, posvečene proučevanju
podzemnega in ne nadzemnega dela rastline,
so pokazale, da koreninski sistem zaznava
zelo širok spekter zvočnih vibracij in da
te vibracije vplivajo na smer rasti
koreninskega sistema, kar imenujemo
fonotropizem (grško, 'phono', zvoč in
,trepetaj' obrabati). (BG)

PATTERNS

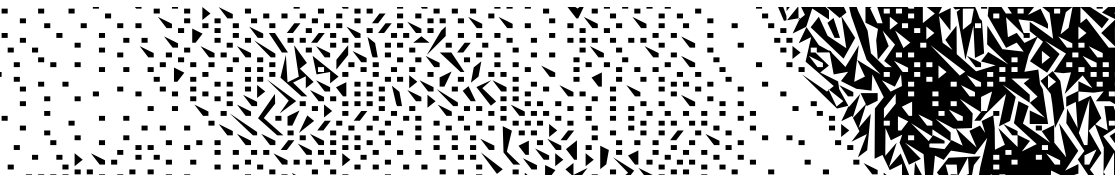


Ants are among plants' most wonderful partners; the communication systems and mutual assistance between these hymenoptera and plants continue to fascinate scientists. (BG)

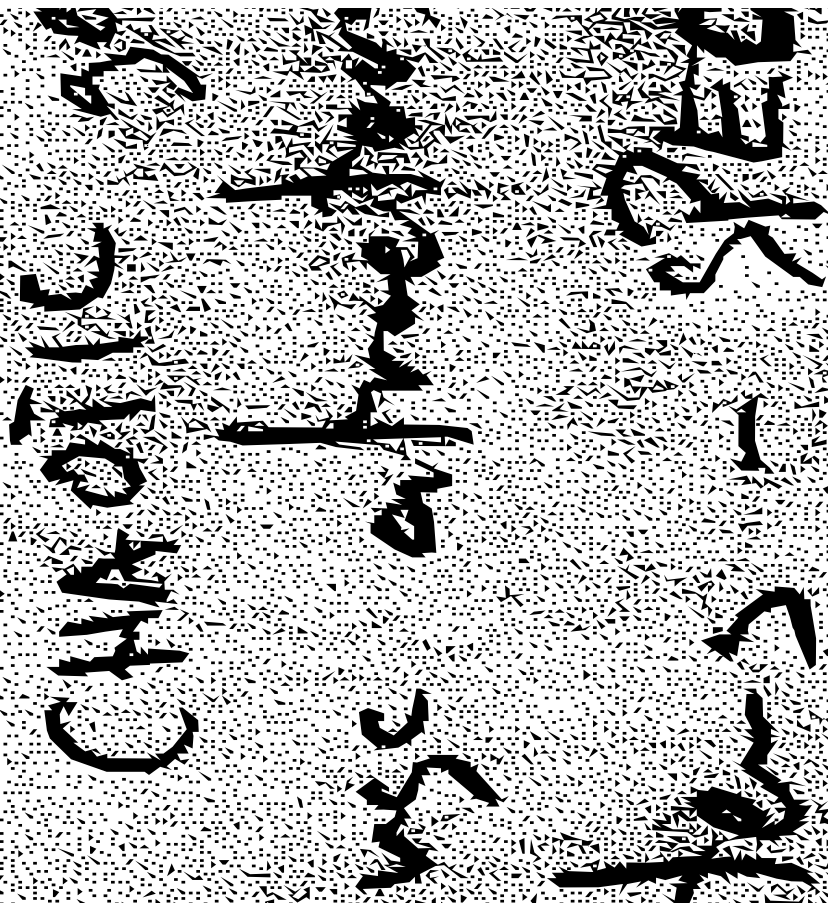




Ko izdumo inteligentnost zivljenjskih oblik, se moramo ozreti onstran mehanizmov oziroma paradigme, ki vidi le algoritmične posledice nespremenljivih pogojev, pa naj bodo to nespremenljivi pogoji organizma ali pa okolja. Namesto tega moramo proučiti tiste primere, kjer zivljenjski procesi, restrukturizacija in redenitajso, restrukturizacija v organizizmu/okolju, pri čemer so tudi sami podvrženi restrukturizaciji in redenitaji. (RA)



Foucault argues that with the emergence of the human sciences at the birth of biopower, the animal is not excluded or forgotten but quite the opposite: animality is the dominant apparatus for investigating both what life is and what life does. The living is no longer primarily vegetable (sessile and awaiting mere categorization) but understood as evolving, appetite-driven, secret, discontinuous, mendacious, inscrutable, always on the prowl, looking for an opening to break free. “Transferring its most secret essence from the vegetable to the animal kingdom, life has left the tabulated space of order and become wild once more.” (Foucault) (PT)



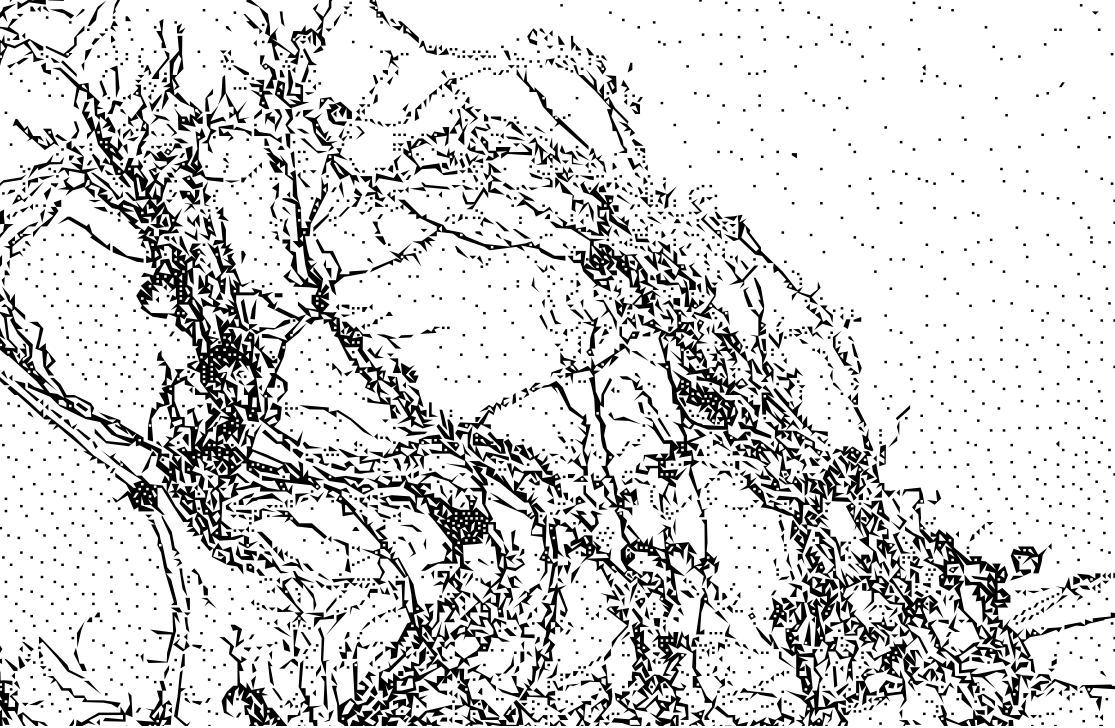
COMPOSITIONAL NOTES III

overall structure, envelope, interesting

Analysis & Foundations (Lecture 2/2014)

- Principles of musical analysis
- musical analysis
- musical analysis
- musical analysis

Mr, ki nas prezame ob [prisotnosti rastlin],
je morda odmev zavedanja naših prednikov o tem,
da je vse, kar potrebujemo in kar nam nudi
prezivetje, v svetu zelenja. Tako je bilo nekoč
in je še danes. (BG)



The root system of even a very small plant may have more than 15 million root tips. (BG)



biological system

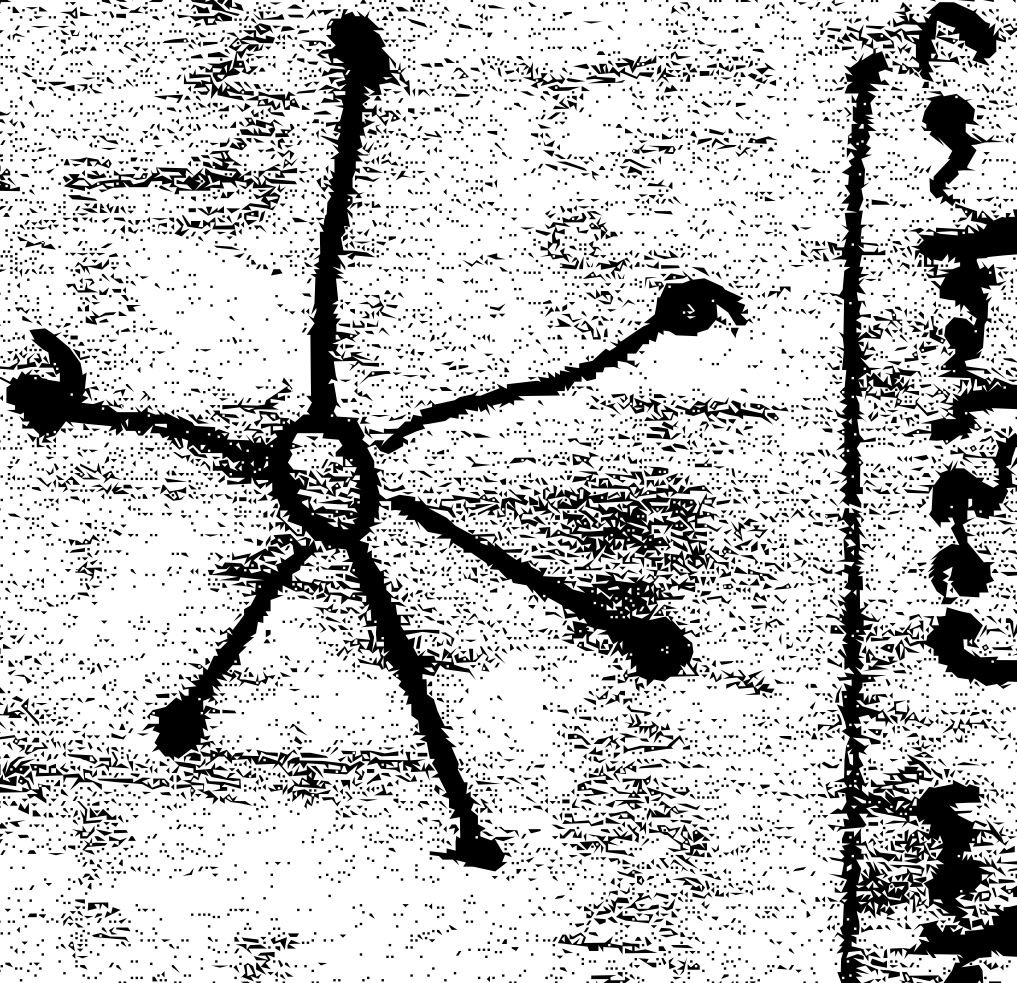
EMERGENCE

organism \rightarrow complex

... oče behaviorizma, Watson, je [rekel]: "znatraj do potankosti izdelanega psihološkega sistema lahko predvidimo dražljaj, če poznamo odziv, in obratno: lahko predvidimo odziv, če poznamo dražljaj." V behaviorističnem modelu ni prostora za kontingentno odločanje, izbiro, eksperiment, kontekst ali namen. Pri raziskovanju rastlin te napake ne smemo ponoviti... (RA)

1.5.1950
6-15-55

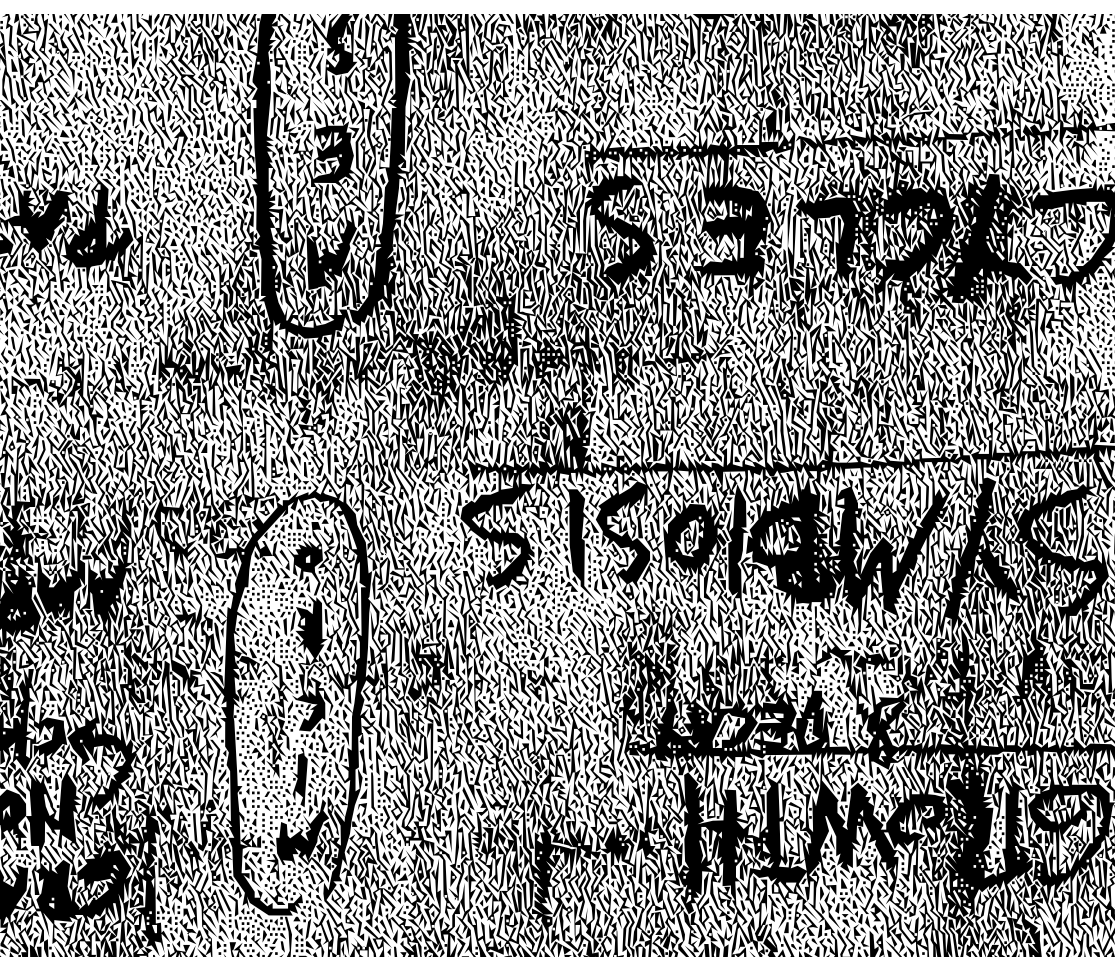
Every root tip is a sophisticated sensory organ. No automated response could possibly answer the requirements of the root tip. Each tip is a [...] 'data processing center'; it doesn't work alone, but in a network within millions of others that make up the plant's root system. (BG)





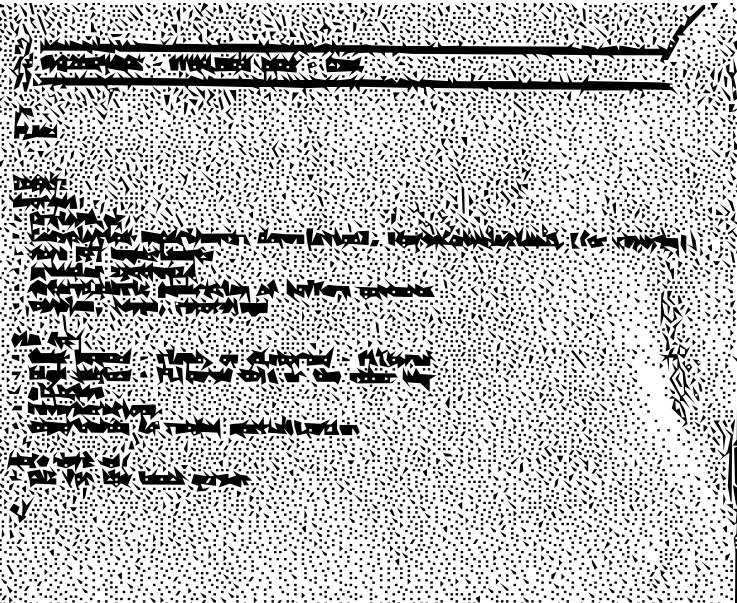
“Rastlina je povezovalni člen
med zemljo in soncem.”
(Kliment Timiryazev [1843-1920])
(BG)

Every
single plant
is a swarm.



MICROSCOPIC IMAGES OF ROOT TIPS AS A SOURCE/MAP FOR SOUND SYNTHESIS

Teološki vidik [nakazuje] na potencialno skozl povratno zanko in integracijo sestavnih interakcij na natiine, ki organizem pripravijo oziroma privedejo do zanj ugodnega izida. Potrebujemo naturalistični koncept teologije, ki bo upošteval kot teoretično ogrodje za raziskovanje in poglavitih naslega razumevanja inteligentnega vedenja v celotni biosferi. (RA)



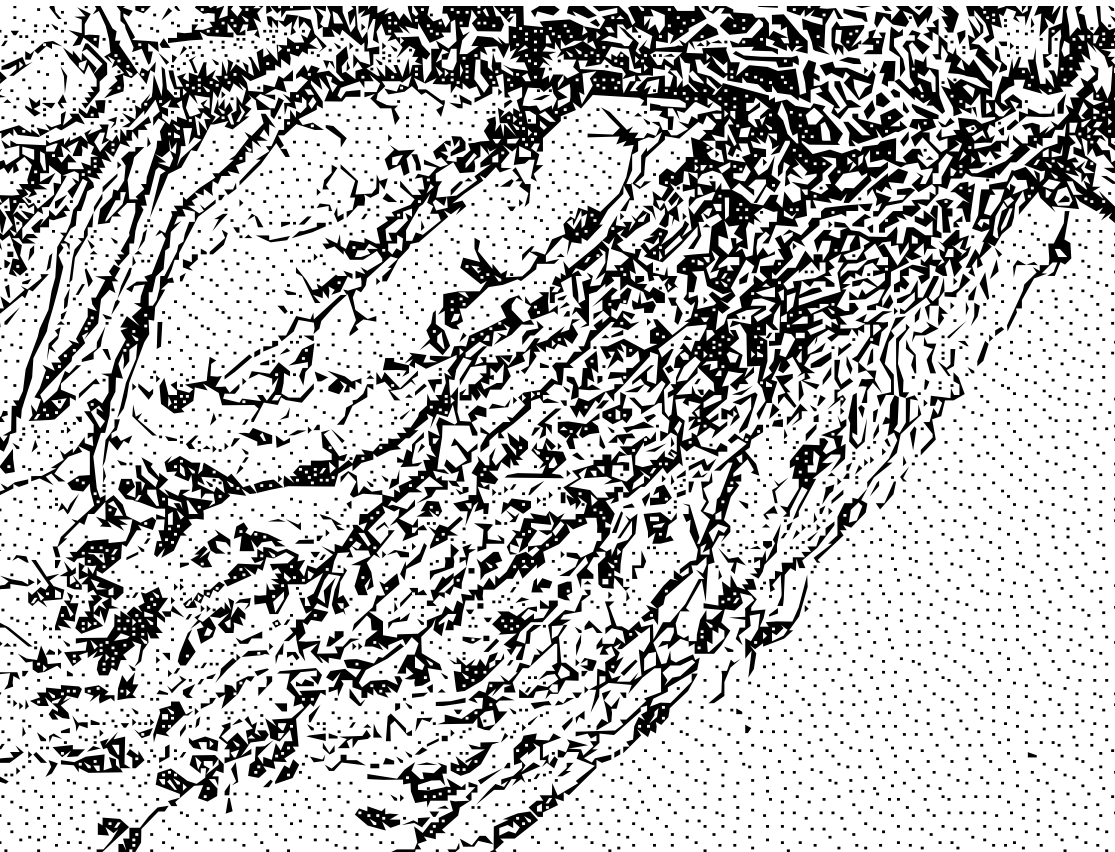
Do 8-člana
later.

THE'S
RUMBLE
GRATULAC ?

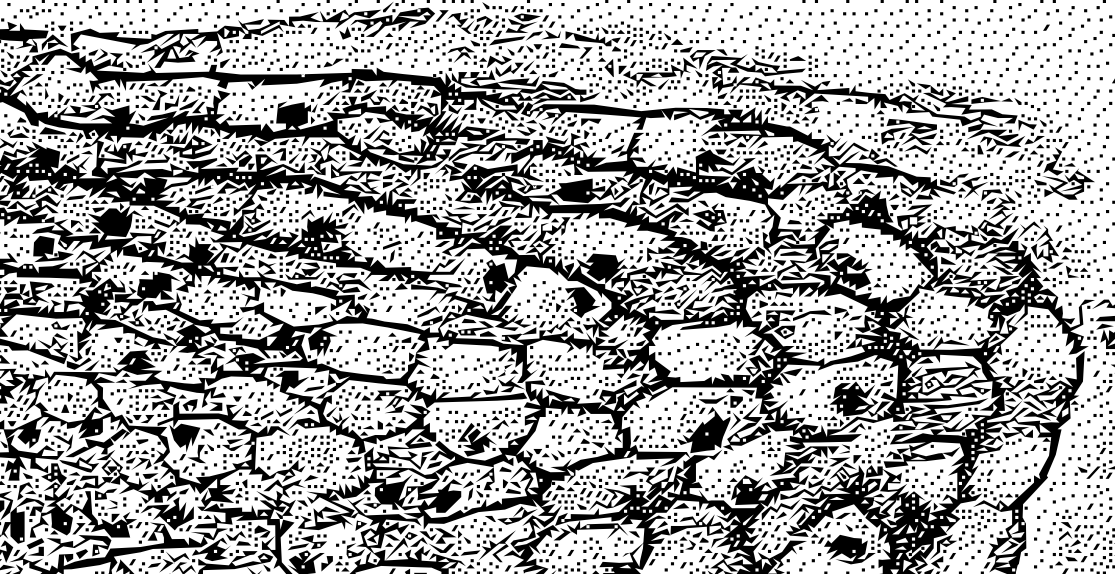
70602 UNCLASS

Swarm intelligence (SI) is the collective behavior of decentralized, self-organized systems, natural or artificial. SI systems consist typically of a population of simple agents or boids interacting locally with one another and with their environment. The inspiration often comes from nature, especially biological systems. The agents follow very simple rules, and although there is no centralized control structure dictating how individual agents should behave, local, and to a certain degree random, interactions between such agents lead to the emergence of “intelligent” global behavior, unknown to the individual agents. Examples of swarm intelligence in natural systems include ant colonies, bird flocking, hawks hunting, animal herding, bacterial growth, fish schooling and microbial intelligence. (WP)

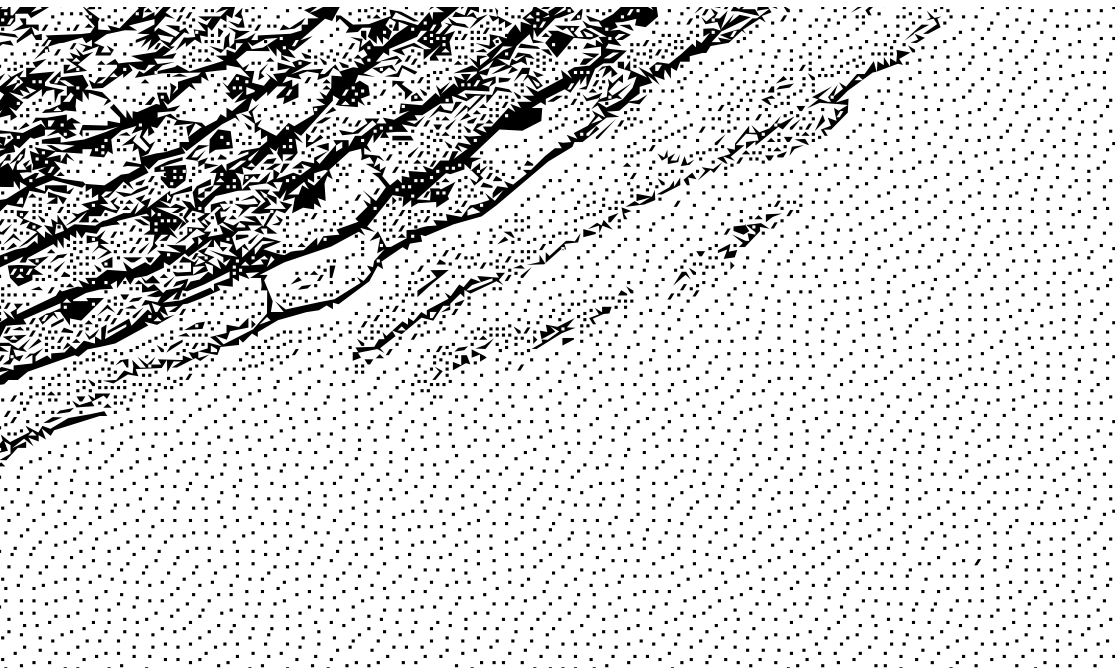
Telesa rastlin so zgrajena modularno, kar pomeni,
da je vsak posamezni del pomemben, ni pa zares
nepogrešljiv ... Če rastlino prežemo na pol,
postaja oba dela neodvisna živeča napreč, in sicer
iz preprostejšega razloga: ko govorimo o rastlini,
ne moremo govoriti o individualnosti. Drevesa,
kaktusa ali grmičevja ne gre primerjati s človekom
ali katero koli živalsko vrsto, temveč si jih je
najbolje predstavljati kot kolonije.
Drevo je pravzaprav bolj kot kolonija čebel
ali mravelj kot pa posamezna žival. (BG)



Luc Ferrari's Visage 1 (1956) should be discussed in terms of cycles, rather than repetitions... I imagined the cycles as if they were individuals, living at different speeds. When they didn't meet, they were independent. When they met... they were transformed by influence or by confrontation. (CR)



... predpostavka, da lahko s pomočjo nekega
mehanizma razumemo - oziroma razkrinkamo - um,
je vprašljiva ... pri mehanicistični
(fizikalno-kemični) redukcijski mentalni
pojmovi sploh ne gre za inteligenco. (RA)



[For Deleuze & Guattari] the rhizome functions as (among many other things) another weapon in their career-long battle against metaphor, against interpretation, against conception of world as a series of hidden possibilities. (PT)

1001

PROTECTIONS - STEUERN

2. THEOSPHERE

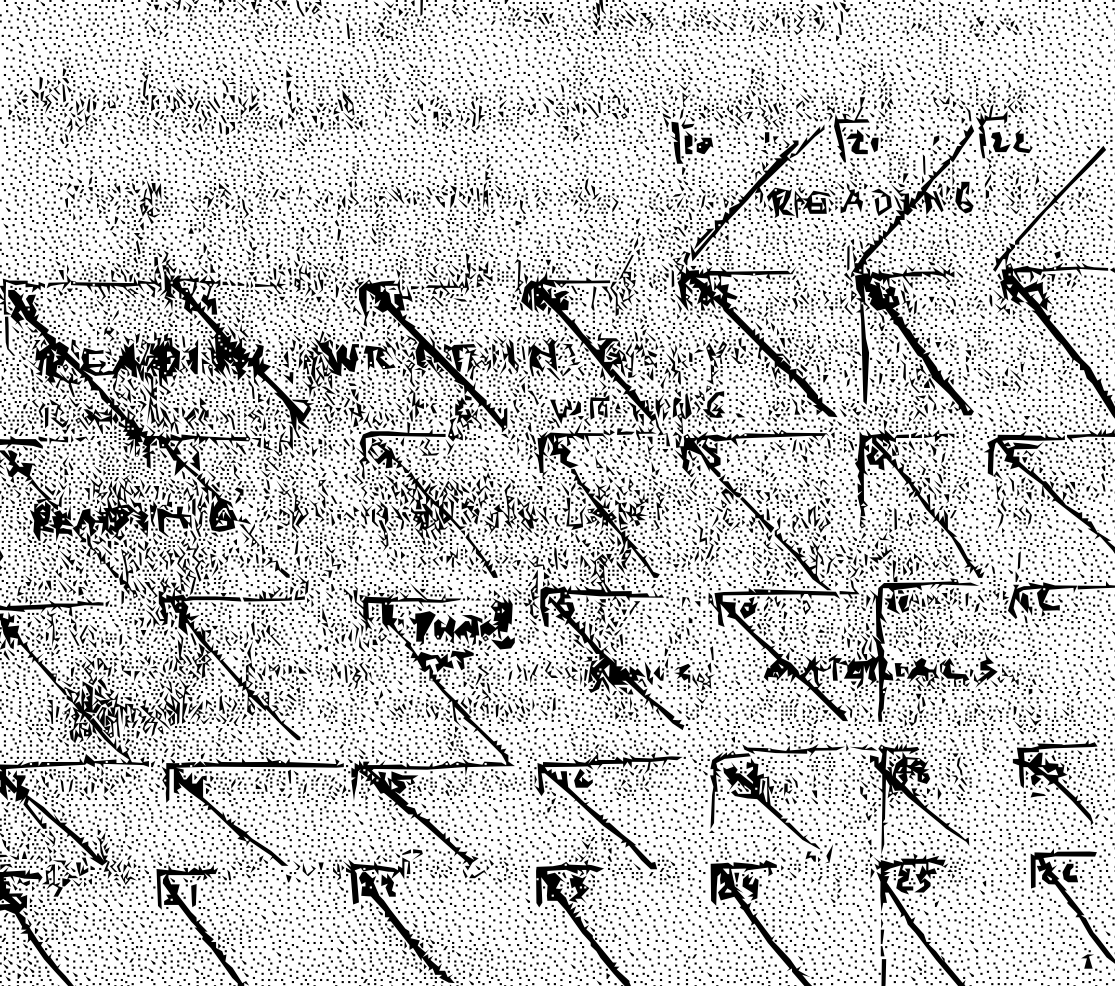
- 14.3. - otvoritar instalacije
- 17.3. - LIVE performance

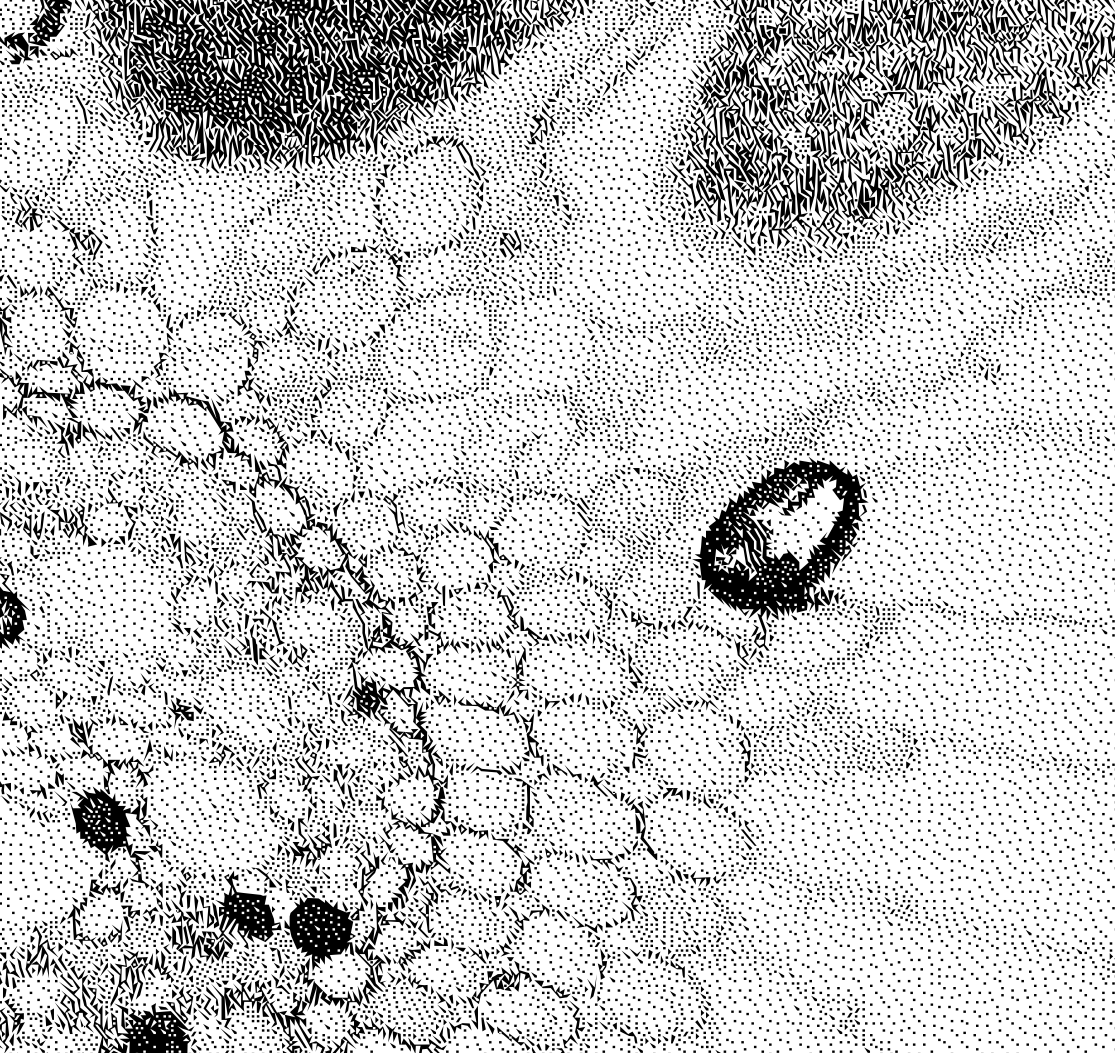
2020

2020

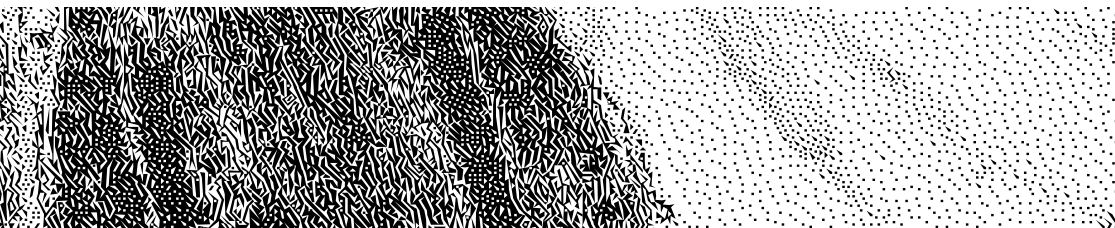
8.1.

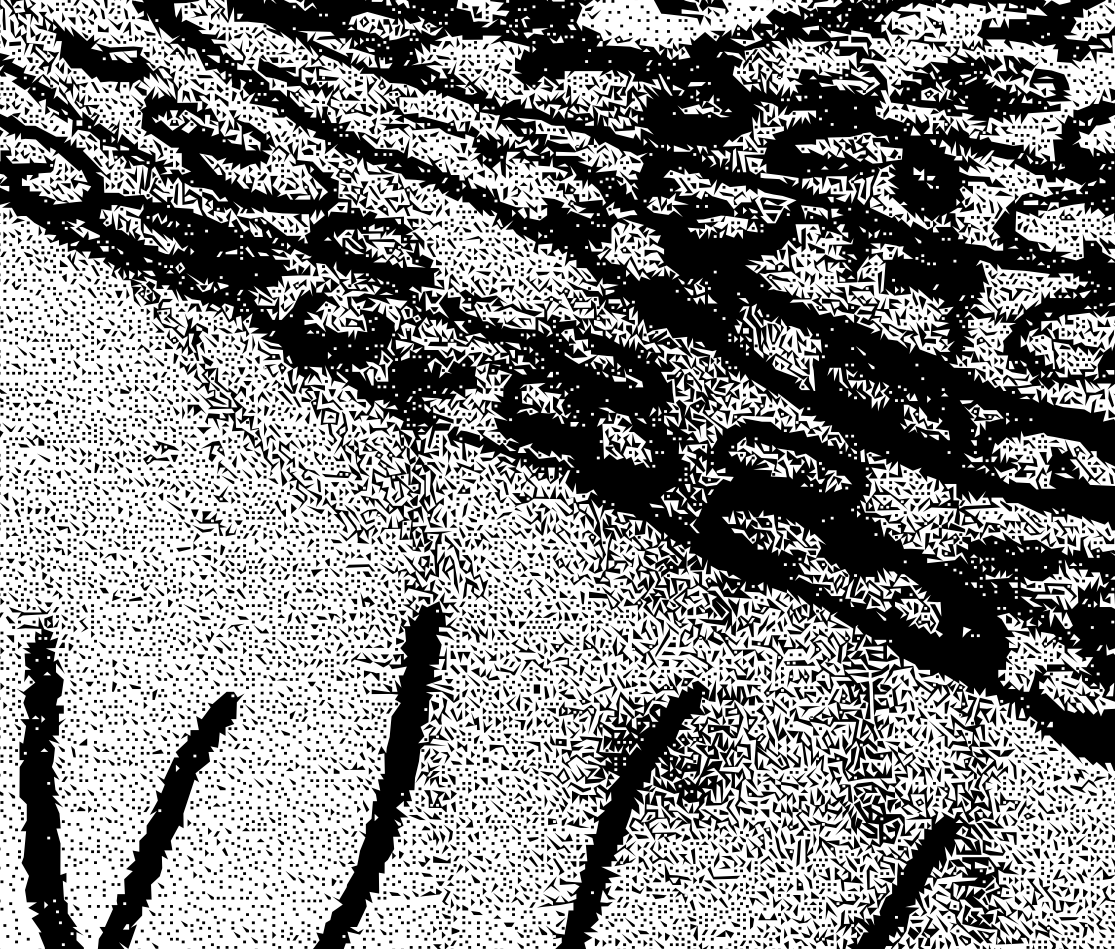
Darwin je veckrat zapisal, da so po njegovem mnenju rastline najbolj nenasadna med vsemi zivimi bitji ("Zmeraj me je navduševalo, če sem lahko rastline povzdignil na raven organiziranih bitij.") (BG)



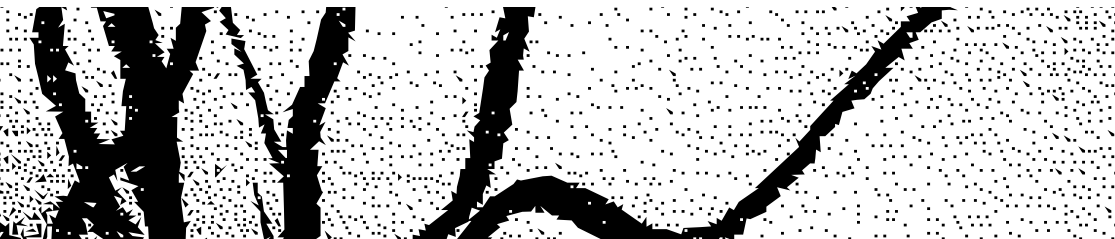


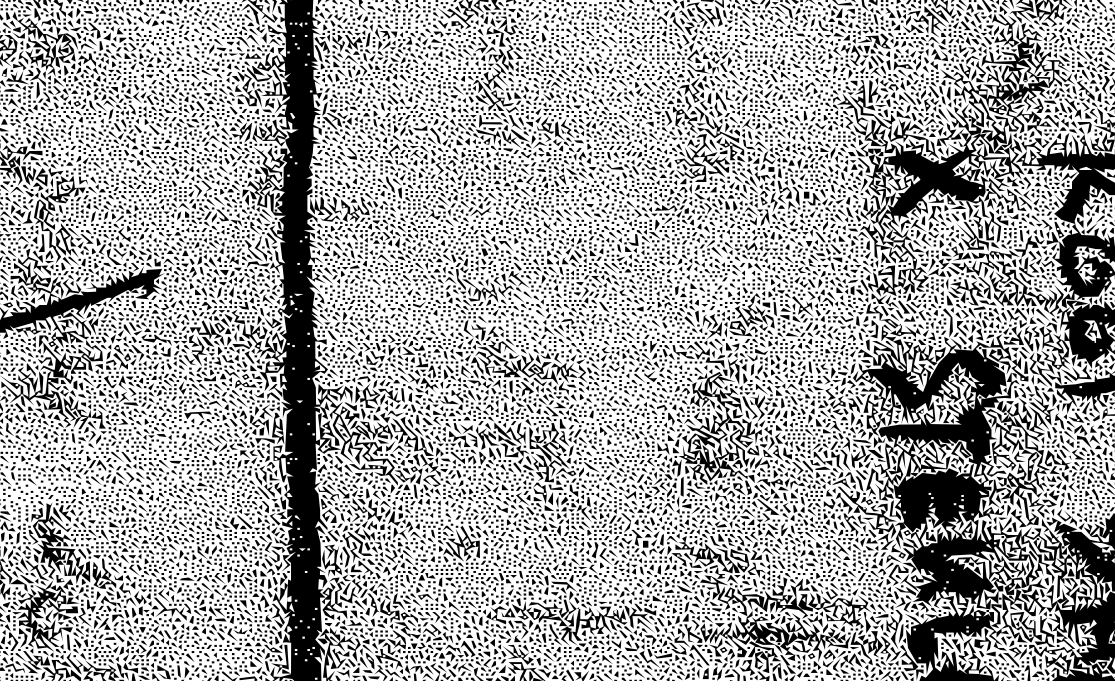
Plants are the mediators between the sun and the animal world. They - or rather their most typical organelles, the chloroplasts - are the link connecting the activities of the whole organic world (that is, of everything we call life) with our solar system's energy center. Thus plants have a universal function for life on our planet. Animals don't. (BG)



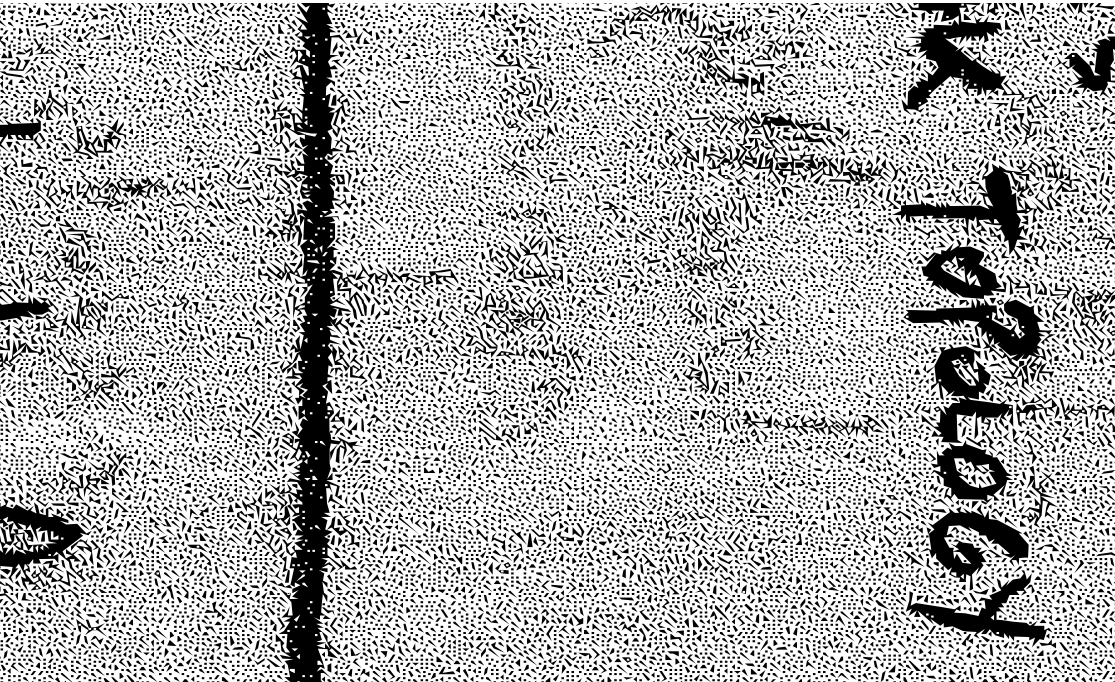


... inteligenca rasti in bi morali razumeti kot
teleološko dejavnost, pri čemer se rastlina
organizira in usklajuje s svojim okoljem v skladu z
določenimi cilji. S tem, ko biologija rasti in po
modelu behavioristčne (in kognitivistčne)
psihologije inteligenco reducira na mehanske uma,
namreč tvega, da bo ponovila, kar je znatno za
behavioristično teorijo o živalih - namreč da
organizmu ne pripisuje umskosti. (RA)

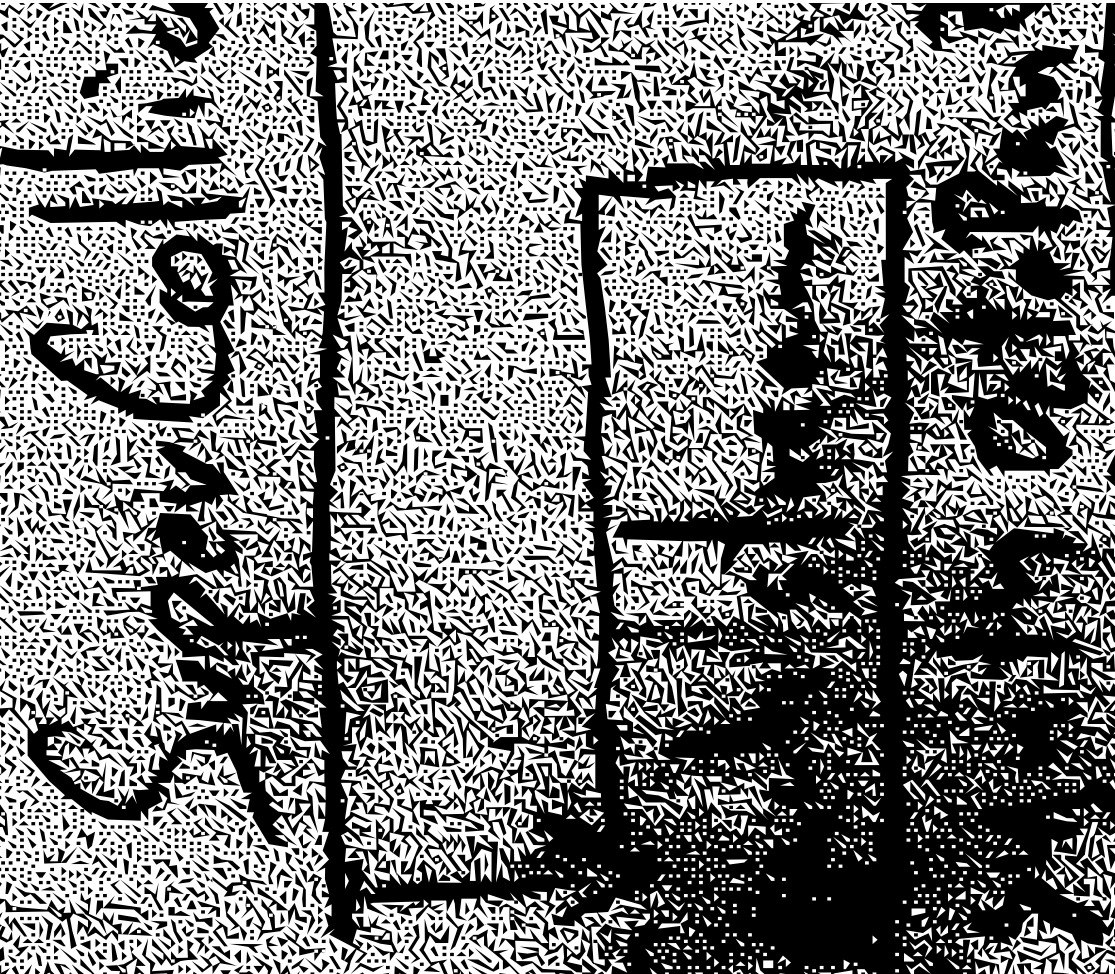


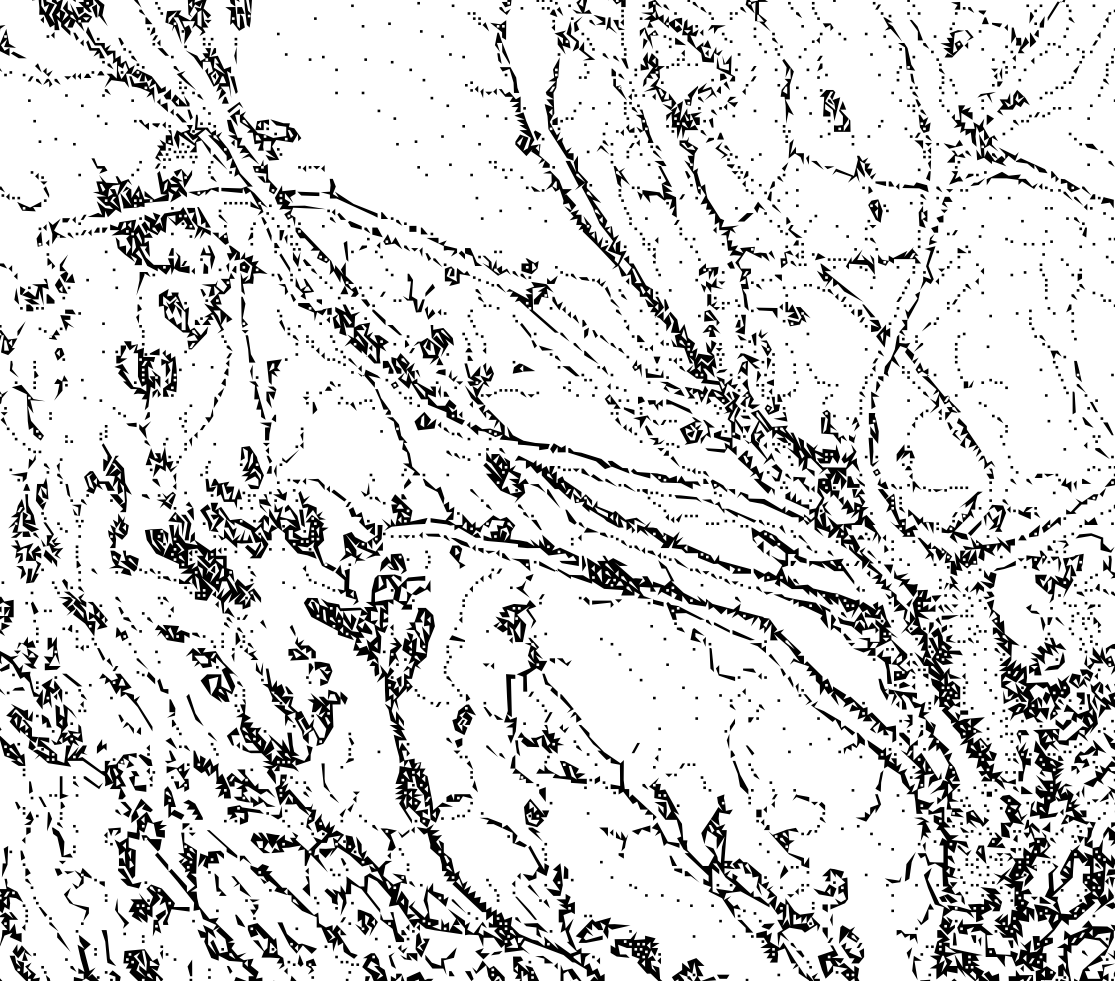


... paying close attention to the power effects rendered by the myriad practices by which we do in fact differentiate ourselves from other forms of life, and what forms of violence those practices inevitably inflict. (PT)



je bil sha'ab [...] božanstvo, numinozna entiteta,
mogóno bitje, a tudi prevažalec)...] tisti, ki je
lahko prevedel poglavitno izkušnjo vizije v
življenje: vizije, ki bi služila kot vezni člen med
dvema stvarnostma, ki so ju Athshani razumeli kot
enakovredni, sanjski čas in čas sveta, in katerih
povezave so - óetudi bistvenega pomena - nefasne in
prikrite? Vezni člen: tisti, ki lahko spregovori o
zaznavah nezavednega. Govoriti, ta jezik, je
pomenilo delovati. Narediti novo stvar. Spremeniti
ali biti spremenjen, radikálni, od korenin navzgor.
Kajti korenine so sanje. (UG)





(UG)

**For
the root is
the dream.**



Plant Growth Foundation

VP: [VP](#)

BG: Brilliant Green, Stefano Mancuso and Alessandra Viola

GR: Composing Electronic Music, Curtis Roads

PT: Plant Theory: Biopower and Vegetable Life, J. Nealon

RA: Deweyan Psychology in Plant Intelligence and Research:

Transforming Stimulus and Response, Ramsey Affifi

TC: The Conversation - Explaining Chaos Theory

UG: The Word for World is Forest, Ursula K. Le Guin

WP: Wikipedia

Plant Growth Foundation

PLANT
GROWTH
FOUNDATION

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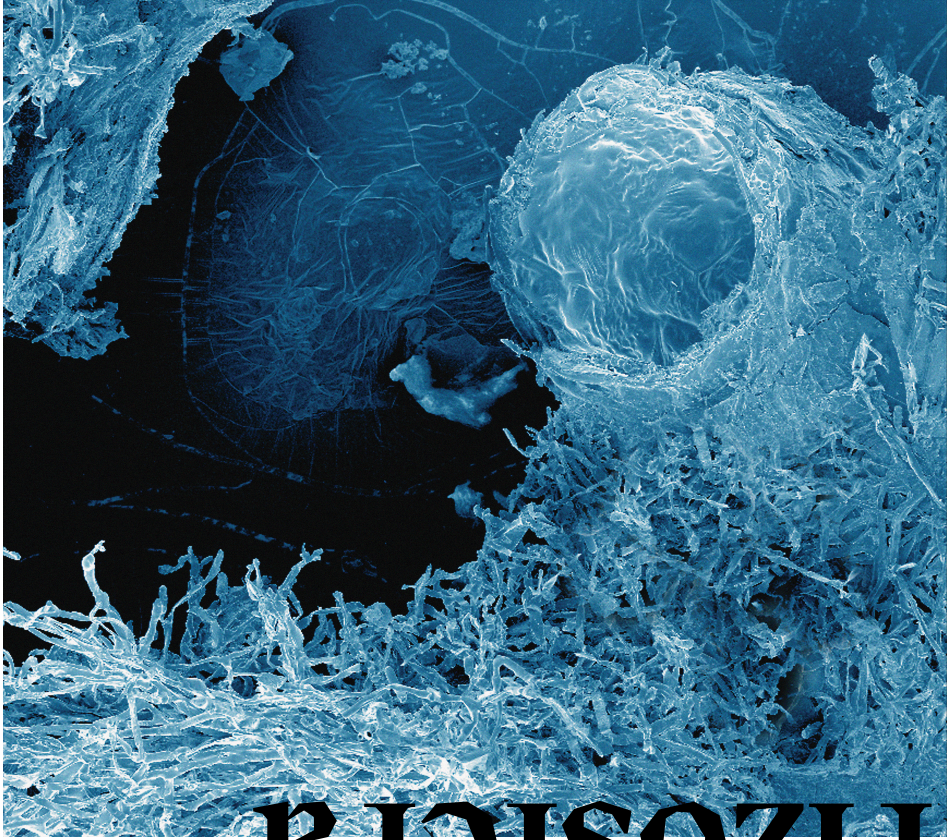
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koreninska rizosfera:
s katerim je korenina v stiku, in ki
gosti številne druge oblike življenja

IZPISKIZAPISKI



rizosfera

Luka Princič