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The 1970s Plant Craze

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Melissa Oresky's practice is rooted in collage and painting and models a “plantlike” process in the studio by “growing” works through iterative processes, often over long periods of time. She gained a BFA from the School of the Art Institute of Chicago, and an MFA from the University of Illinois at Chicago and has exhibited her work in the United States, Europe, New Zealand, and South Korea. She also recently co-organized *Collage Office*, an experimental, charitable platform for artists to make work by appointment at The Franklin, Chicago, IL. She is Professor of Painting and Drawing at Illinois State University.

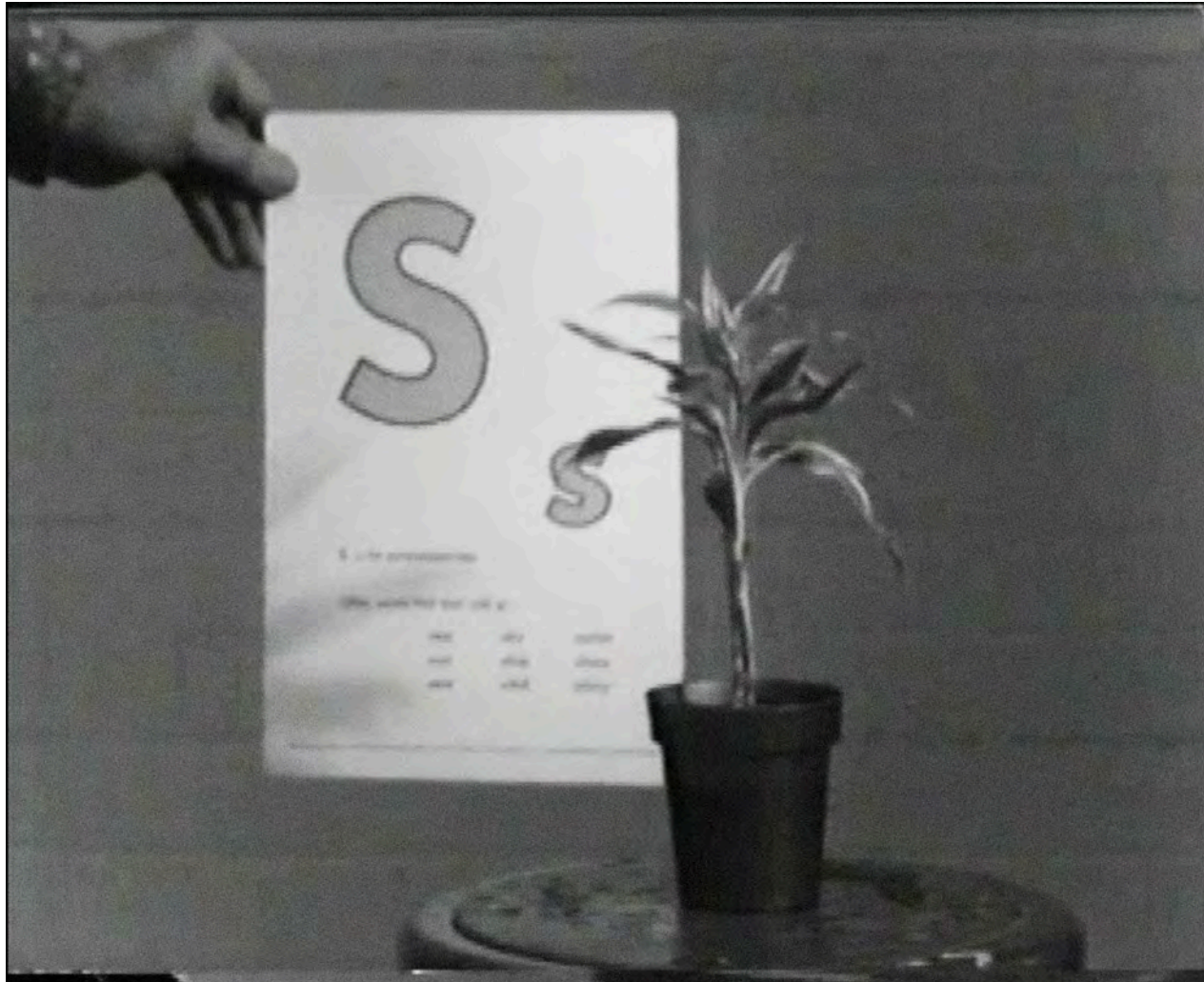
The 1970s plant craze

In the early 1970s, a general plant craze caught on in visual and popular culture alike. Against the background of New Age spirituality and the flourishing of ecological thinking, the 1970s plant mania came as an eccentric blow to the belief that sentience and intelligence are a human prerogative. It also relied massively on the cybernetic paradigm: envisaged as self-regulating biological systems, plants were recognized as communication systems in themselves. In this essay, I sketch a brief portrait of this complex cultural moment, as visual culture, and in particular film, came to be permeated by references to plant communication, plant sentience and plant intelligence.

text by **Teresa Castro**

In his 1972 video *Teaching a Plant the Alphabet*, the late John Baldessari holds up a succession of children’s alphabet cards, repeating each letter to a potted banana plant until he has completed the alphabet. Made for presentation at one of his classes at Cal Arts, *Teaching a Plant the Alphabet* is often quoted as a conceptual art parody, a reference to Joseph Beuys’s influential performance *How to Explain Pictures to a Dead Hare* (1965). Both points are fair: in his own words, Baldessari found conceptual art of that time “too pedantic” and Beuys’s performance was indeed one of the artist’s most famous. But as Baldessari himself recalls, “*Teaching a Plant the Alphabet* was done during the hippy times. There were books about how to communicate with your plants. I thought, okay, I guess I’ll start with the alphabet, and then we’ll talk...”¹

Indeed, the early 1970s were “hippy times”, even if the zeitgeist of hippie culture was slowly beginning to wane, and a conservative revolution loomed on the horizon. By 1981, the flower power of the flower children had withered: daffodils and dandelion chains proved harmless against Reagan’s doctrine. In the meantime, the seeds of our current infatuation with plant intelligence were sown, for Baldessari’s recollection is accurate: in the early 1970s, the belief that plants were sentient and intelligent entities, capable of reacting to human’s thoughts and emotions (as well as to animals’ pain or music) became widespread, nurturing popular culture’s flirtation with vegetal beings. Magazine articles on the extraordinary powers of plants were literally everywhere, from the pages of *The Ladies’ Home Journal* to those of *Electrotechnology*.² As the diktats of interior decoration stipulated it was in good taste to fill one’s residence with rattan furniture and all sorts of leafy creatures cascading gracefully from macramé hangers, it became natural to play music to your houseplants. One certain Mrs. Hashimoto took Baldessari’s satirical venture seriously, setting herself to teach the Japanese alphabet to a cactus. As a *New Scientist* 1973 article observed, not only “every art school diploma has its share of vegetable sculptures (...), but also several artists are following in the footsteps of scientists by conducting their own experiments with plants and treating these activities as works of art”.³ Echoing other previous fads – tulipomania in the 17th century; the fern fever of Victorian times; etc. –, a general *plant craze* emerged in the late 1960s, catching on in visual and popular culture alike. Unlike those earlier fads, which fundamentally cut down the vegetal to the ornamental, the 1970s plant mania came as an eccentric blow to the belief that sentience and intelligence are a human prerogative. Against the background of “hippy times”, which celebrated its first Earth Day in the



John Baldessari

Teaching a Plant the Alphabet, single-channel video, black and white, 1972 © Estate of John Baldessari

spring of 1970, a different form of relationship between humans and “nature” was slowly taking shape.

The plethora of articles, books, vinyl records, artworks, and films on the subject of plant communication cannot fully be explained by hippie counterculture’s love of nature, weed, magic mushrooms, and other mind-altering substances – even though these were important. Cold-war paranoia, New-Age spirituality and, more importantly, the flourishing of ecological thinking played their role in an entangled web of sometimes paradoxical tendencies where the zucchini seed that germinates faster to the sound of Mozart and the philodendron that thrives to Indian flutes are as much the proof of plants’ mind-blowing sentience as the tacit evidence of rock music’s fundamental evilness.⁴ Moreover, the 1970s plant craze relied massively on the cybernetic paradigm, systems theory, and electronics. Envisaged as self-regulating biological systems, plants were recognized not only as being able to communicate but as communication systems in themselves. Their electrical and chemical responses to the environment and other stimuli (such as telepathic stimuli) were now understood in terms of inputs and outputs that generated feedbacks. Their intelligence resides in the capacity to learn and self-correct in response to feedback, mirroring the intelligence of other larger and more complex natural systems, among which Gaia itself, as famously advo-

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cated by James Lovelock and Lynn Margulis in 1975. In what might appear as a surprise to those who presumed that “plant communication” was merely about hippies hugging trees or passing through the chemical doors of perception, the 1970s plant craze was eminently *technophilic*: even eco-mystical quests to reach the plant-other often depended on the interfacing of electronic extensions, i.e., on “bio-sensing” (conversely, psychedelic experiences were sometimes explained with the language of cybernetics). Perhaps more than ever, the intermediation of different machines proved essential to the plant intelligence argument: *the communicative, sentient plant is a mediated plant*. As a matter of course, the history of science and pseudoscience’s encounter with plants’ awareness of other plants and of their surroundings has relied, from the 19th century onwards, on the mediation of visual and other technologies. Without this visual and audio scaffolding that allows us to tune into the so-many unanticipated possibilities and aspects of vegetal life, our conception of the plant-other in sensitive, intentional, and ultimately intelligent terms would not be the same. In the following pages, I wish to sketch a brief portrait of this complex cultural moment, as visual culture, and in particular film, came to be permeated by references to plant communication, plant sentience, and plant intelligence.

The Secret Life of Plants

1959. Reverend Franklin Loehr published a book on *The Power of Prayer in Plants*.⁵ Based on 700 “experiments” implicating 150 people and 27,000 seeds, the book illustrates how McCarthyism and its deep-rooted fright of communist atheism stirred American piety: in the 1950s, as many as “94% of Americans believ[ed] in the power of prayer”.⁶ Scientists quickly dismissed Loehr’s book, but the idea that the mind could somehow have its way over (vegetal) matter continued to make progress. “Psychic research”, whose potential for military and domestic intelligence was apparently evident for more than just the odd science-fiction writer, was to gain momentum from the 1950s onwards, on both sides of the Iron Curtain.⁷ A quick search on the CIA’s online archives returns an interesting number of declassified reports on the study of “psychic phenomena”, sometimes in relation to plants, which the military, in their perpetual war against “the enemy”, dreamt of turning into organic-sensors, bio-invaders, green spies.⁸

In 1966, and against all reasonable odds, an inconspicuous event was to shake the very-serious world of botanical knowledge. A polygraph expert working for the CIA, Cleve Backster (1924-2013), decided on a whim to hook one of his machines to the leaf of a dracaena. He wanted to see how the plant reacted to being watered. To his astonishment, after a minute or so, the galvanometer registered a surge of electrical activity in the plant, similar to that of an emotional stimulus in a human subject. Backster was intrigued and decided to proceed with his “experiment” by dunking a leaf of the plant in a cup of hot coffee. No reaction. What if he burnt it? And there it happened: as he imagined the dracaena being set on fire, the needles of the polygraph rouse again as if the plant could read his mind. As his hagiographers put it, this was Backster’s Eureka moment: he “felt like running into the street and shouting to the world, “Plants can think!”⁹ In the years to come, he and his collaborators multiplied the experiments, plugging dozens of plants and vegetables into lie detectors and concluding that lettuces, onions, oranges, bananas, and a multitude of ordinary houseplants could perceive and respond telepathically to human thoughts and emotions. As incredible as it sounds, and much to science’s dismay, Backster’s theses on plants’ extrasensory perception and their astounding emotional capacities, shared by the author in the Winter 1968 issue of the *International Journal of Parapsychology*, were to quickly spread worldwide.¹⁰ How was this possible?

“Hippy times” helped. As two concerned scientists were to bitterly acknowledge in the pages of *American Scientist* in 1979: In the troubled years of the late 1960s, a wave of antiintellectualism swept the United States, accompanied by an antisecularism that still persists in some measure. (...) Critics were quick to equate science with anti-

humanism and call for the reliance on alternate ways of arriving at an understanding of the universe about us. This appeal found receptive ears in a world worried about pollution, overpopulation, unemployment, growing crime, and – perhaps most important – a nasty and persistent war in which technology played a major role.¹¹

More than “anti-intellectualism”, “anti-scientism,” or “anti-humanism”, it’s the “reliance on alternate ways of arriving at an understanding of the universe about us” that interests me. As we will see, the hippie desire to heal the crisis in human/nature relationships overinvested (and sometimes romanticized) the communicative, systemic model behind Backster’s theses, according to which “mind” can extend beyond the body into its surroundings. Regarding his theories, they would’ve probably remained confidential if not for the flare of journalist (and former OSS spy) Peter Tompkins, the author of such celebrated New Age classics as *Secrets of the Great Pyramid* (1971) and *Mysteries of Mexican Pyramids* (1976). With the help of botanist and science vulgarizer Christopher Bird, Tompkins wrote *The Secret Life of Plants*, mainstreaming Backster’s findings and rediscovering, along the way, a number of forgotten plant-intelligence champions, such as Bengali biologist Jagadish Chandra Bose. Propelled by a lavish advertising campaign, including a partial pre-publication with a catchy title in the pages of *Harper’s Magazine* – “Love Among the Cabbages: Sense and Sensibility in the Realm of Plants”¹² – the book became a bestseller and was quickly translated into many different languages. Taking advantage of the volume’s worldwide success, producer Michael Brown adapted it for the screen in 1978: directed by Walon Green, *The Secret Life of Plants* included an original soundtrack by none other than Stevie Wonder.

But *The Secret Life of Plants* was not the only book to get the most out of the untapped powers of plant sensibility and communication. The same year, Dorothy Retallack’s *The Sound of Music and Plants* was also to sell well.¹³ Like Backster (and Loehr before him), Retallack, a “doctor’s wife, housekeeper, bookkeeper, mother, [and] grandmother to fifteen”¹⁴, had conducted a number of “experiments” in the late 1960s, using the “biotronic control chambers” available at Temple Buell College, Denver. Her thesis: rock music was harmful to plants (and, therefore, to humans too). Retallack was not the first to investigate the effects of classical music on plants’ growth rate; she was the first, however, to expose them to a tape of Led Zeppelin, Vanilla Fudge, and Jimi Hendrix. According to her findings, plants seemed to like Bach and Ravi Shankar; much to Retallack’s surprise, they even gave positive evidence of enjoying jazz. However, when it came to rock, they leaned away from the music source, displaying smaller leaves and eventually dying. “Some of those plants look like the people who attend rock festivals”, confided an appalled Retallack to the pages of the *New York Times*.¹⁵

Despite Retallack’s old-school moral panic about rock, the idea that plants were sensitive to music’s soothing capacities resonated with New Age’s beliefs in the healing energies of musical melodies. In October 1970, CBS aired “a Rock-versus-Shankar experiment” involving plants (and significantly filmed with time-lapse cameras): Retallack’s name became known all-across the US. Albums of “music to grow plants” were then making their appearance in record shops, such as the one that Dr. George Milstein produced exactly the same year, complete with a booklet and a packet of coleus seeds.¹⁶ During the 1970s, a few plant music discs were released. Some of them simply compiled chamber and classical music hits; others, such as Baroque Bouquet’s *Plant Music* (1975) or Roger Roger’s *De la musique et des secrets pour enchanter vos plantes* (1978), offered original compositions for their green audiences.¹⁷ Among these, Mort Garson’s *Plantasia* (1976), with its percolating Moog rhythms, acquired a legendary status.¹⁸ One album, in particular, Molly Roth’s *Plant Talk/Sound Advice* (1976), evokes Baldessari’s parody, as spoken word artist Roth talks to ivies, ferns, and other plants, wondering if they understand English.¹⁹ At the same time, a few artists became interested in bio-sensing and plant-generative music, among which John Cage who used “amplified plant materials” (i.e. cacti) as musical instruments in pieces like *Child of Tree* (1975) and *Branches* (1976). Others, such as eco-feminist Annea Lockwood, explored the effect of plant growth on musical instruments. But what about film? What role did it play in this peculiar plant craze?

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Wired Plants and Cybernetics

Film, I believe, played an important role – and not only during “hippie times”. As I’ve previously hinted at, the mediation of graphic technologies seems to have been a decisive element in the scientific (or para/pseudoscientific) exploration of the richness and complexity of plant life; a sort of epistemological scaffolding opening up theoretical horizons around plants’ agency and their potential “awareness”, “sentience”, “thinking” or even “intelligence”.²⁰ I’ve argued elsewhere that the sentient plant is in many ways a *mediated plant*: the 1970s plant craze illustrates this remarkably well since it relied massively on polygraph machines’ methodical scribbles, photographs of vegetal “energy auras”, electronic renditions of plants’ signals and films of all sorts.²¹ Indeed, if cinema’s powers are unique (and I believe they are), when it comes to the mediated plant, film should first of all be placed in the larger landscape of (graphic) technologies allowing for the perception of plants’ behavior. Among these, the 20th-century representatives of the more ancient graphic method – polygraphs such as Backster’s iconic “lie detector”, simpler galvanometers, spectrographs, etc. – are vital. Without these recording apparatuses, the secret life of plants would’ve remained concealed, imperceptible to the naked eye – and the naked ear. These machines transform plants’ electrical and chemical signals into a nonverbal, iconic language: the language of graphs, diagrams, and, ultimately, mathematical formulas. Endowed with an aura of scientificity, these images extend vision into previously unseen (if not unknown) realms (as plant bioacoustics expands audition further). Despite scientists’ immediate and continual insistence on Backster’s “uncontrolled experiments, random observations, and anecdotal reports”²², the theses on plants’ extrasensory perception and their astounding emotional capacities progressed, partially pushed by scientific imagery, in particular as embodied by graphs of jagged lines drawn on strips of white scrolling paper. Articles, books, films, and even records’ sleeves and booklets all include images of plants wired to these apparatuses as they meticulously generate their machinic self-portrait, giving us access to their inner, secret lives.

Of course, “plants writing themselves” was not a new idea. For the highly influential *The Power of Movement in Plants* (1880), Charles and his son Francis Darwin generated an astounding amount of images, conceived with ingenious devices involving smoked glass plates and beads of wax on glass needles and allowing for plants to record their own motion.²³ Even more suggestively, in 1927, physicist and plant physiologist Sir Jagadish Chandra Bose (1858-1937) published the exquisitely illustrated *Plant Autographs and their Revelations*.²⁴ Bose was an important pioneer in the study of radio and electromagnetic waves, who later turned his attention towards the movements and electrical responses in plants. In the context of his research, he designed several innovative instruments, such as the “photosynthesis recorder”, the “magnetic crescograph” (registering plant growth), the “oscillating recorder” (documenting the ascent of sap), or the “automatic recorder” (recording leaf movements as well as variations of temperature in plants). As Bose puts it in *Plant Autographs*:

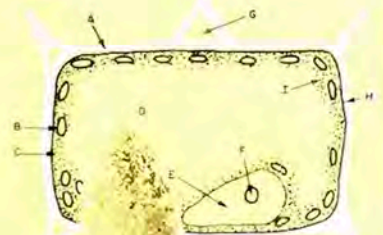
I have been able to make the dumb plant the most eloquent chronicler of its inner life and experiences by making it write down its own history. The self-made records this made show that there is no life-reaction in even the highest animal, which has not been foreshadowed in the life of the plant.²⁵

Bose’s enterprise encapsulates modern science’s aspiration to mechanical objectivity, aptly described by science historians Lorraine Daston and Peter Galison as the “insistent drive to repress the willful intervention of the artist-author, and to put in its stead a set of procedures that would, as it were, move nature to the page through a strict protocol, if not automatically”.²⁶ But when the proud inventor refers to his machines as “artificial organs of extraordinary sensitiveness”,²⁷ Bose also comes very close to some of Norbert Wiener’s famous views. Believing that engineering theories of control and communication could explain behavior in humans, animals, and machines, Wiener

ELECTRONICS and the LIVING PLANT

By L. GEORGE LAWRENCE

Can plants be used with electronic equipment for some future exotic sensing and control system? Some investigators, performing unusual experiments, believe they can be.



- A. Cell wall
- B. Chloroplast
- C. Cytoplasm
- D. Vacuole
- E. Nucleus
- F. Nucleolus
- G. Intercellular space
- H. Cytoplasmic membrane
- I. Vacuolar membrane



George Lawrence

"Electronics and the Living Plant", in *Electronics World*, journal article, 1969 © Electronics World

IT has been known for a long time that plants have electrodynamic properties. Their ability to process complex test currents and to behave in a computer-like "go, no-go" binary mode is unique. But never in all those millennia since the first green leaves poked their heads out of Paleozoic swamps have plants been given more professional attention (other than from botanists) than they have in recent years.

After much initial skepticism regarding plants' semiconductive and general electromotive qualities, here are but a few of the topics that science is speculating about today:

1. Can plants be integrated with electronic readouts to form major data sensors and transducers?
2. Can plants be trained to respond to the presence of selected objects and images?
3. Is their alleged supersensory perception (SSP) verifiable?
4. Of the 350,000 plant species known to science, which family is most promising from an electronics point of view?

Electrical Characteristics

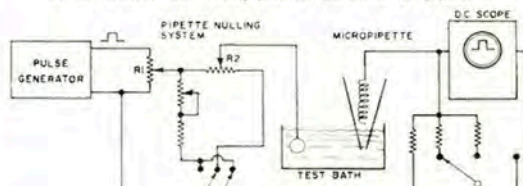
The effect of electrical excitation on plants was noted in the 18th century and described in Dr. Jullabert's book "De l'électricité des végétaux," published in Geneva in 1748. Later, in 1924, Dr. Stern gave an excellent summary in his publication "Die Elektrophysiologie der Pflanzen." Up-to-date findings were described in G. Ungar's work entitled "Excitation" (1963), which also gives a good overview of bioelectric and electrophysical phenomena in general. However, taken together, many schools continue to attach more significance to plant growth hormones and regulators than to electrical phenomena *per se*.

The behavior of a living cell is dramatically complex and unique. There are responses to light, heat and cold, radiation, injuries, and touch. Electrical properties can be investigated with microelectrodes, a sample of which is shown in the test arrangement of Fig. 1.

Microelectrodes usually take the form of micropipettes, consisting of a very thin glass envelope, a conductive liquid, and a metallic helix or insert for conveying current to external readouts. Their electrical impedance is of the high-ohm type and must be verified frequently by using a special test bath. The d.c.-nulling arrangements and parallel resistances permit investigations of over-all impedance characteristics—which, ideally, should lead to no impairment of pulsing-test currents propagated through the electrode systems. The test bath may be used as an approximate standard, featuring impedance and conductive properties similar to those of biological electrolytes.

Typically, strong electric currents flowing through a plant cell have the effect of causing an immediate contraction of the cytoplasm of a cell (best seen in the *spirogyra* or *elodea canadensis*), from which physiological recovery is impossible. Less intense currents cause either a partial retraction from the cell wall or, after the current has been stopped, resumption of normal cell functions. Upon swam spores and anthozooids swimming in water, electricity has the peculiar

Fig. 1. Test setup for measuring the electrical characteristics of micropipettes used for data pick-off from micro-organisms. R1 is used to adjust the amplitude of the test pulse. R2 to balance out steady-junction potential of pipette.



coined the term "cybernetics" in 1948, laying the foundations of a new interdisciplinary field that was to become extremely influential during the Cold War.²⁸ In his attempt to find common elements in the functioning of the human nervous system and automatic machines, Wiener suggested that "every instrument in the repertory of the scientific-instrument maker is a possible sense organ".²⁹

Bose's links to cybernetics are not limited to his understanding of rendering apparatuses as artificial sense organs or human sense organs as "antennae, radiating in various directions and picking up messages of many kinds".³⁰ His insights on vegetal beings as communicating systems that respond to stimulation through electric signaling also foreshadow some of the tenets of the cybernetic model. Bose's devotion to decrypting what he calls the "plant script" is instructive, particularly when he discusses the pulsing movements of the *Desmodium gyrans*, today known as *Codariocalyx motorius*. On this remarkable species, a tropical shrub known for the gyratory self-movements of its leaves, he writes: "the small leaflets move up and down like the semaphore formerly employed for telegraphic signaling", concluding that "there is an evident similarity between the automatic pulsation of the leaflet of the Telegraph-plant and that of the animal heart."³¹ Although Bose was by no means the first to refer to this specimen as the "telegraph plant"³², the media metaphor is worth stressing. The telegraph in the plant's name refers to the optical semaphore telegraphs made of movable wooden arms which became a privileged means of military communication in Europe in the late 18th century and early 19th century (in India, semaphore telegraphs were introduced in 1810 and went out of service in 1880). In *Plant Autographs*, Bose refers to the optical telegraph, after which the *Desmodium gyrans* was effectively named but, symptomatically, his discussion of the electromechanical pulses of plants evokes the mechanisms of electrical telegraphy, which uses the coded pulses of electric current to transmit messages. To think about communication in terms of electrical signaling is a portentous affair since the former is no longer thought of in exclusionary, human-centered ways.

Cybernetics was to flourish in the URSS, permeating not only the discourse but also the imagery around plant science, as evidenced by two soviet documentaries shot by the Tsentrnauchfilm (the Moscow Studio of Science Films), *The Voice of Plants* (T. Iovleva, *Golos rastenija*, 1968) and *Are plants sentient?* (Leonid A. Panishkin, *Čuvstvujut li rastenija?* 1970).³³ The films' iconography is clearly marked by the overwhelming presence of recording apparatuses, such as the polygraph and their simple, stark graphs, or other electronic instruments. Plant communication was taken very seriously in the Soviet Union, where, by the end of the 1960s, it had become a subject worth studying in the best-equipped science labs. *The Voice of Plants* starts with several shots of three researchers in white coats, gathered around a long strip of scribbled paper: their expert-eye can decipher what the machines themselves have already decoded. The film alternates exterior views of prairies and forests with lab shots, crosscutting the customary time-lapse sequences of flowers blooming and plants spiraling around their tutors. However, the lab shots are more numerous and significant: the quest to hear and understand "the voice" of plants (which Soviet scientists hope will open up perspectives in terms of plant breeding in artificial climates) is presented as an eminently technical enterprise. Superimpositions of plants and polygraph machines, foregrounded against a dark background, rank among the films' most striking images. As a small electronic chip is carefully grafted onto a plant's stem, the cybernetic paradigm becomes evident. Reports in the Soviet press mention transforming plants into "a live electric relay"³⁴: already in 1959, the director of the Laboratory of Biocybernetics of the Institute of Agrophysics, Vladimir Grigorievich Karamanov, had published a report on "The Application of Automation and Cybernetics to Plant Husbandry".³⁵ In the US, the October 1969 number of *Electronics World* includes an article on "Electronics and the Living Plant": inspired by Backster's findings, the author describes the former as an "exceptionally promising field".³⁶

Are Plants Sentient?, another Soviet science-propaganda film, evokes the experiments led by Professor Ivan Isidorovich Gunar, head of the Plant Physiology Department at the Timiryazev Academy of Agricultural Sciences in Moscow. The film (which

If the strings of two violins are exactly tuned, then a note sounded on one will cause the other to vibrate in

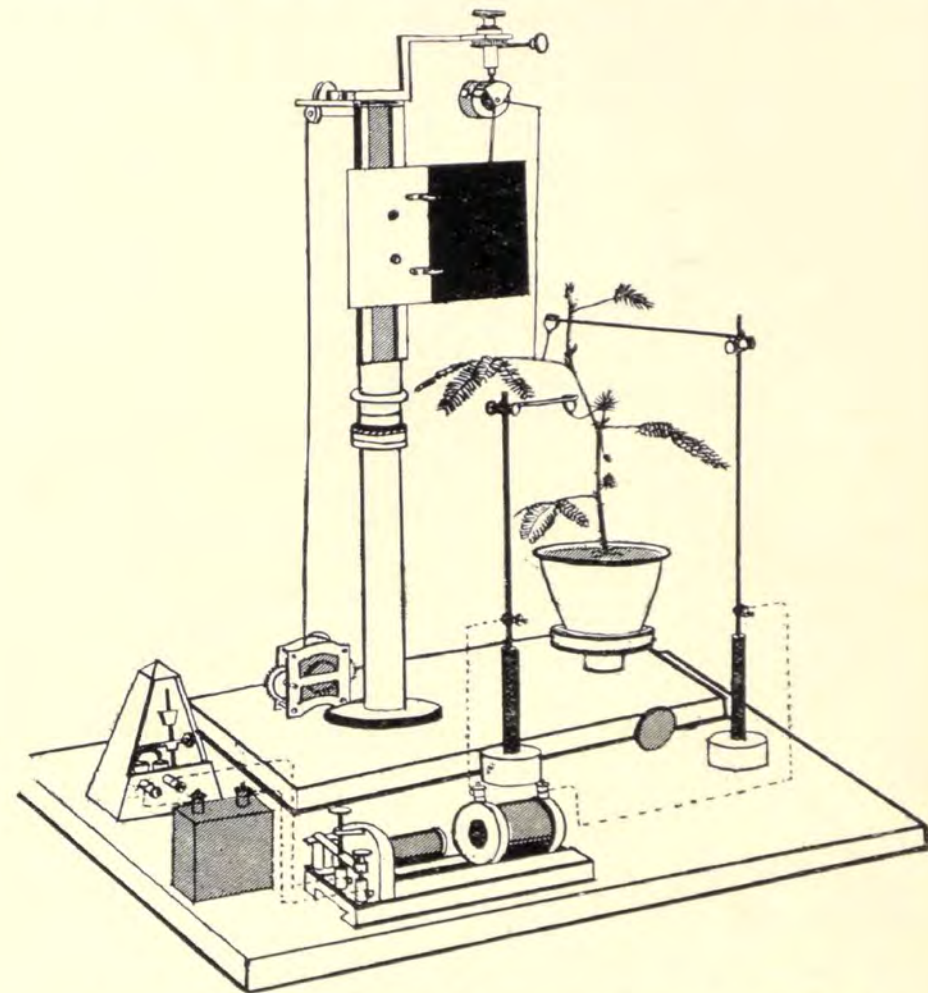


FIG. 7. Complete apparatus for automatic record of response of Mimosa.

sympathy. Suppose we tune the writer V to vibrate a hundred times in a second; if now we sound a note which causes an air-vibration of one hundred times per second,

Sir Jagadish Chandra Bose

"Complete apparatus for the automatic record of response of Mimosa", in *Plant Autographs and their Revelations*, illustration, 1927 © Estate of Sir Jagadish Chandra Bose

includes a sequence recalling Bose's pioneer experiments) insists massively on the electronic apparatuses available at the Academy. *Are Plants Sentient?* is mentioned by Tompkins and Bird in *The Secret Life of Plants*: shot by Gunnar's chief assistant, Leonid A. Panishkin, it was shown to an American delegation in the summer of 1971. According to Tompkins and Bird, one of the American envoys

stated in his report that the movie's intriguing part was the method used to record the data. Time-lapse photography made the plants seem to dance as they grew. Flowers opened and closed with the coming of darkness as if they were creatures living in a different time zone. All injury-induced changes were recorded by a sensitive polygraph attached to the plants.³⁷

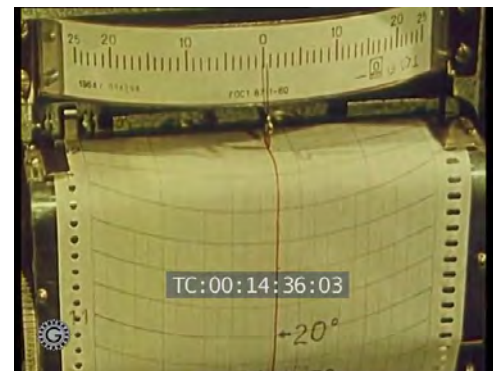
The American delegate's reaction is surprising since time-lapse cinematography was used from at least 1898 onwards to study plant-motion.³⁸ However, his visual ignorance didn't prevent him from hinting at the exact point raised by film's capacity to manipulate time scale: motion pictures can negotiate a transition from the plant-as-object into the plant-as-subject – what is more, into a subject with intentional movements. By reconciling the temporality of plant life with the temporality of human life, film potentially overturns the basic subject-object dualism, rearranging the frontiers of the living, extending intentionality to a multitude of nonhuman subjects, sensing other sentiences, and exposing different modes of being alive. As French writer Colette wrote in 1924:

A time-lapse film documented the germination of a bean... At the revelation of the intentional and intelligent movement of the plant, I saw children get up, imitate the extraordinary ascent of the plant climbing in a spiral, avoiding an obstacle, groping over its trellis: "It's looking for something! It's looking for something!" cried a little boy, profoundly affected. He dreamt of a plant that night, and so did I.³⁹

As film critics and theoreticians remarked very early on, cinema seems to be "animism's chief apostle"⁴⁰: instead of disenchanting the world, film re-enchanting it, by imputing interiorities to animals, objects, machines and, naturally, plants. By virtue of cinema's expressive resources (time lapse, the close-up, editing, etc.), films on plant motion seemed to resuscitate what botanical herbaria dried and flattened between their yellowish sheets of paper.⁴¹

.....
*Perfectly illustrating
 New Age's penchant for
 enlivening perceptions of
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 plant sentience and
 intelligence as a cue to
 think about the systemic
 interconnectedness of
 all life.*

Rekindling with a world full of non-human intentionalities was not, however, the Soviets' goal, even though a reporter from *Pravda* remarked that Professor Gunnar not only "talked about plants as he would about people" as he "appear[ed] to converse with them".⁴² Marxist cybernetic science was more preoccupied with discovering computable truths allowing for an even more objective and efficient instrumentalization of the world (in short, with epistemic objectives of prediction and control). While hegemonic, this program had little in common with the New Age agenda of the American screen adaptation of Tompkins and Bird's book. Like *The Voice of Plants* and *Are Plants Sentient? The Secret Life of Plants* (1978) features prominently all sorts of recording and sensing instruments; unlike them, however, the film is much more daring in its equally technophilic envisioning of plant beings. Perfectly illustrating New Age's penchant for enlivening perceptions of nature, the picture takes plant sentience and intelligence as a cue to think about the systemic interconnectedness of all life. Towards the end of the film, footage referring to the Dogon's ancient cultural beliefs is crosscut with images from a modern telescope pointed at Sirius, as Stevie Wonder sings, "a seed is a star".⁴³ Not surprisingly, *The Secret Life of Plants* also makes abundant use of macro-photography and time-lapse sequences: as French filmmaker and theorist Jean Epstein summed up in 1935, "fast motion reveal[s] a world where the kingdoms of nature know no boundaries. Everything lives".⁴⁴



T. Lovleva

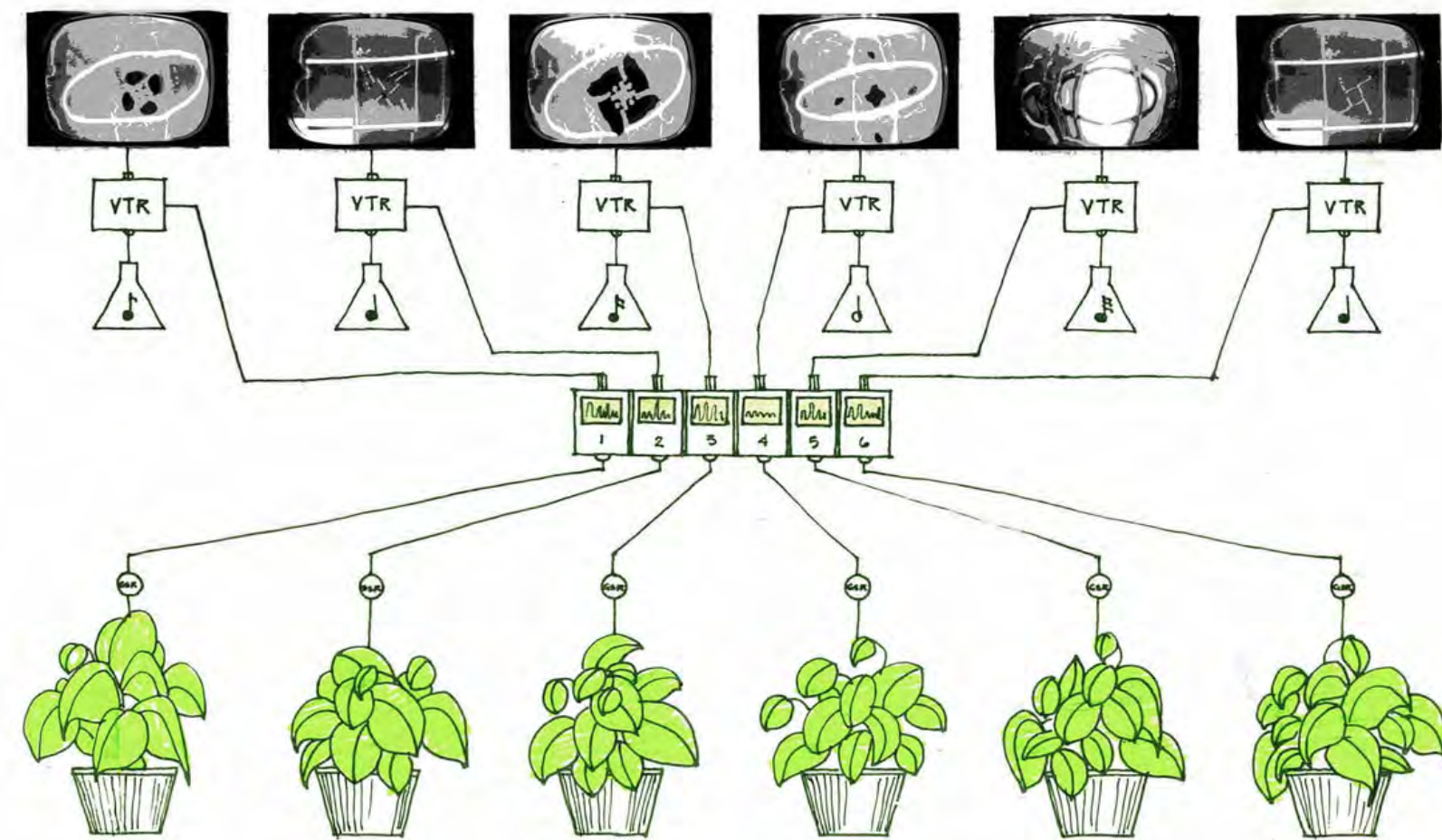
The Voice of Plants, colour film, 1968 © T. Lovleva / Archives Gaumont Pathé



Walon Green

The Secret Life of Plants, colour film, 1978 © Michael Braun

But more original and certainly more epochal than the time-lapse shots is the film's "cybernetic art" sequence, documenting a performance involving artists Richard Lowenberg, John Lifton, Jim Wiseman, and Tom Zahuranec. Reduced to a minimum in the picture's final edit – i.e., to footage from John Lifton's "Green Music" installation at the tropical conservatory of San Francisco's Golden Gate Park –, the sequence has since been recalled by Lowenberg.⁴⁵ In early 1976, Lowenberg, then an artist in residence at the NASA Ames Research Center, was asked by the film's production team to conceive a number of sequences for the screen version of *The Secret Life of Plants*. Influenced, among others, by cybernetics and the ecological writings of Gregory Bateson, Lowenberg had published in 1972 a small blurb on the concept of "environetic synthesis" in the now historic video magazine *Radical Software*. Accompanied by a suggestive drawing depicting an uncanny "circuited self", made of a joint human head and a television monitor, the text's premise was "that one's environment could be designed to respond to one's own physiology, such as the brain waves (EEG) and muscle potentials (EMG), with video, audio and



PLANT G.S.R. CONTROL OF AUDIO-VIDEO TAPE SPEED.

Richard Lowenberg

"Plant GSR Control of Audio-Video Tape Seed", drawing, 1971-1978 © Richard Lowenberg

other sensory devices responding to the person".⁴⁶ With the help of John Lifton (who, in 1975, had presented his "Green Music" installation at the Whitechapel Gallery in London),⁴⁷ Jim Wiseman (who had built copies of the Paik/Abe video synthesizer and of the Sandin Image Processor) and Tom Zahuranec (who had wired a rhododendron into the oscillators of a Buchla Synthesizer live on radio in 1972 and invited the audience to telepathically communicate with it),⁴⁸ Lowenberg conceived a spectacular media-performance based on the interfacing of plants and different types of synthesizers. In addition to the restaging of Lifton's "Green Music" in San Francisco (an installation based on the bio-electric sensing of plants' reactions to the presence of humans and implicating a battery of monitoring devices), an experiment involving wired plants and six performers connected to bio-telemetric systems was shot in a Hollywood studio. Bioelectric information from humans and plants was inputted to audio and video systems, which outputted glitching, colored videos, and plant noise in a feedback loop connecting plants, humans, and machines: in sum, opening up the doors of perception. The communicative model inherent to Backster's hypothesis reaches here its cybernetic paroxysm. In its embodiment as bio-media performance (as "bio-dis-play", in Lowenberg's terms), *The Secret Life of Plants* is a

collaborative venture between organic and non-organic systems, humans and non-humans. Tune in and be(come) aware: electronic mediation is the strategy chosen to counter the deafness and backgrounding to which vegetal beings are usually referred, bringing forth a new "ecology of mind", as Bateson would put it.⁴⁹ As video-art pioneer Juan Downey – whose *Vegetal System of Communications for New York State* proposed, in 1972, to transform electromagnetic energy between humans and philodendrons into a navigation tool – had intuited, cybernetic technology bore the portentous promise of closing "the man-nature chasm."⁵⁰ Moreover, the images and sounds made under Lowenberg's guidance for *The Secret Life of Plants* embody the idea of the electronic signal as medium; not surprisingly, in the early 1970s, he had worked with Steina and Woody Vasulka. Plant communication was by now more than a simple business of jagged lines drawn on strips of white scrolling paper: John Baldessari might have laughed at it, but plant communication had (also) become video art.

Conclusion

By the end of the 1970s, Tompkins and Bird's bestseller had captured popular imagination. References to the book popped up here and there, as in Philipp Kaufmann's remake of *Invasion of the Body Snatchers* (1979), where green plants are played classical music in a mud-bath parlor by an attentive keeper. Also, in 1979, a thriller directed by Jonathan Sarno, *The Kirlian Witness* (rereleased recently under the title *The Plants are Watching*) tells the story of a woman who attempts to telepathically communicate with a philodendron to find out who murdered her plant-loving sister. The film's heroine acquires a copy of *The Secret Life of Plants*, becomes interested in Kirlian photography (a collection of photographic techniques used to capture the phenomenon of electrical coronal discharges and understood by many to be "auras"), and even rents a lie detector. An episode from *Tales of the Unexpected*, "The Sound Machine" (1981), imagines an engine capable of perceiving the ghastly screams of flowers being cut.⁵¹ The same year, in an episode from *Darkroom*, a botanist develops an apparatus able to read daisies' minds. His wife learns from the flowers of his affair with his assistant and shoots him dead.⁵² In short, the communicative model quickly became a B-series plot.

From the 1950s onwards, plant agency had become a way for science-fiction and horror films to give voice to communist anxieties (the alien plant spores turn "pod people" in Don Siegel's *Invasion of the Body Snatchers*, 1956), radiation fears (the scowling tree stump from Dan Milner's *From Hell it Came*, 1957), or concerns about genetic manipulation and bio-engineering (the half-human, half carnivorous plant from *Venus Flytrap*, 1970).⁵³ Since an army of vegetal villains had been feasting on women's flesh for years, an exploitation film such as *Please Don't Eat my Mother* (dir. Carl J. Monson), starring a shy man who befriends a houseplant with unusual appetites (a parody of Roger Corman's 1960 film *The Little Shop of Horrors*, featuring an odd-looking blood-thirsty, consumerist plant), could see the day in 1973. The plant craze of "hippy times" eventually turned plant agency into a spoof, from Baldessari's *Teaching a Plant the Alphabet* to the cult-classic *Attack of the Killer Tomatoes* (1978).

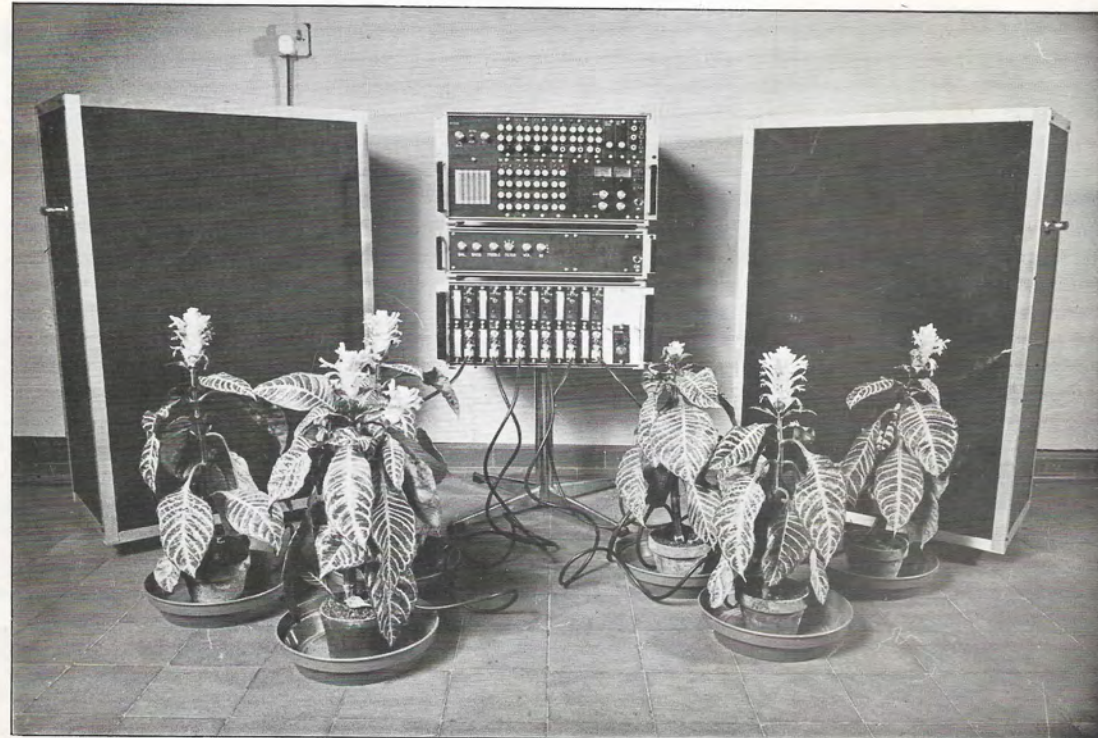
The Secret Life of Plants badly impacted serious scientific research on plants' sensory and perceptual capacities. Widespread press coverage of Backster's pseudo-experiments contributed to this backlash. Work on plant communication and plant signaling "was somewhat stigmatized, and the limited availability of funding and other resources constrained further progress".⁵⁴ Indisputably, Backster's theses on the "primary perception" of plants were non-sense. Still, the real baby – the study of plant awareness and its potential challenging of the exclusiveness of both knowing and feeling as human assets – was thrown out with the bathwater. Almost thirty years had to pass before scientific works main stre-

Whitechapel Art Gallery, Whitechapel High Street, London E1 7QX

John Lifton

'Green Music'

Experimental gallery, 29 May-6 July 1975

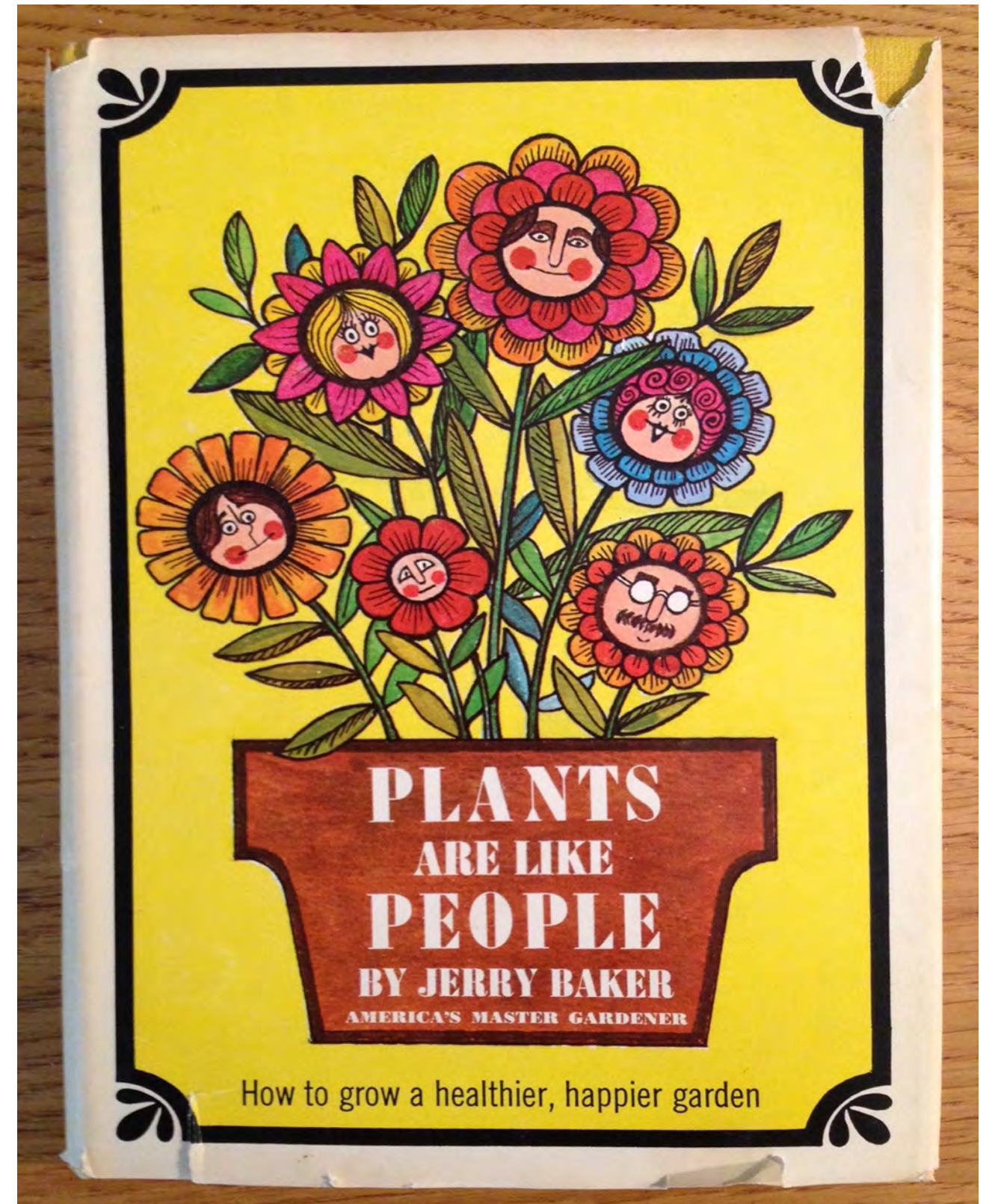


Green Music installation

photograph by Michael Dunn

John Lifton

Green Music, exhibition leaflet, 1975 © John Lifton



Jerry Baker

Plants are Like People, book cover, 1973 © Jerry Baker

aming the perceptual sophistication of plants – such as Chamovitz’s *What a Plant Knows: A Field Guide to the Senses* (2012)⁵⁵ – were to see the day, as a general “plant turn” sweeps through different fields of knowledge and creation. Plants and their singular life forms, for so-long relegated to the margins of conceptual thinking about life itself, finally jut out the leafy, decorative setting to which they were backgrounded. In our present dire ecological crisis, to acknowledge the richness and complexity of plant-life is an invitation to withdraw from a centric reason that separated humans from “nature”, situating human life outside and above it. In what constituted a striking ecological critique of Enlightenment science and its holy dualisms, “hippy times” attempted to tell a different kind of story about “Man” and “Nature” and grappled with a fundamental epistemological shift. Most of all, they experimented widely with alternative modes of engagement with what poet Gary Snyder described as “the most ruthlessly exploited classes”: “animals, trees, water, air, grasses”.⁵⁶ As we emerge shell-shocked from a global pandemic, what are we to do now? Maybe we can learn from the past: instead of imagining that “plants are like people”, as suggested by “America’s Master Gardener” in 1971,⁵⁷ we can focus instead on what it means to be human on a shared planet.

Endnotes

- [1]Morgan, J., “Somebody to Talk to: John Baldessari”, *Tate Etc.*, 1st December 2009: <https://www.tate.org.uk/tate-etc/issue-17-autumn-2009/somebody-talk> (last accessed November 1st, 2019).
- [2]Boulton, B., “Do Plants Think?”, *The Ladie’s Home Journal*, May 1971 and De La Warr, G., “Do Plants Feel Emotion?”, *Electrotechnology*, April 1969.
- [3]Reichardt, J., “Art at large”, *New Scientist*, vol. 59, n^o 858, 9 August 1973, p. 347.
- [4] On ecological thinking, see Belgrad, D., *The Culture of Feedback. Ecological Thinking in Seventies America*, Chicago, and London: 2019.
- [5] Loehr, F., *The Power of Prayer in Plants*, New York: Signet Books, 1959.
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- [7] See Ostrander, S., Schroeder, Lynn, *Psychic Discoveries Behind the Iron Curtain*, New Jersey: Prentice Hall, 1970.
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- [11] Galston, A. W. and Slayman, C. L., “The Not-So-Secret Life of Plants: In which the historical and experimental myths about emotional communication between animal and vegetable are put to rest”, *American Scientist*, vol. 67, n^o 3, May-June 1979, p. 337-344.
- [12] Tompkins, P., Bird, Ch., “Love Among the Cabbages: Sense and Sensibility in the Realm of Plants”, *Harper’s Magazine*, November 1972, p. 90-96.
- [13] Retallack, D., *The Sound of Music and Plants*, Santa Monica, California: De Vorss and Co, 1973.
- [14] *Ibid.*, p. 15.
- [15] Ribley, A., “Rock or Bach an Issue to Plants, Singer Says”, *New York Times*, February 21, 1971: <https://www.nytimes.com/1971/02/21/archives/rock-or-bach-an-issue-to-plants-singer-says.html> (last accessed November 1st, 2019).
- [16] George Milstein, *Music to Grow Plants*, 1970 (E.S.C.).
- [17] Baroque Bouquet, *Plant Music*, 1976 (Amherst Records) and Roger Roger, *De la musique et des secrets pour enchanter vos plantes*, 1978 (Tchou Éditeur).
- [18] Mort Garson, *Plantasia*, 1976 (Homewood Records).
- [19] Roth & Bricker, *Plant Talk/Sound Advice*, 1976 (Plant Talk Productions).
- [20] These terms are obviously non-equivalent, referring to different ways of envisaging the richness and complexity of plant-life. Symptomatically, they are all used again today, as different fields of knowledge, from biology to philosophy, have taken an interest in plant life. See, among many others, and on biology’s side, Chamowitz, D., *What a Plant Knows: A Field Guide to the Senses* (New York: Scientific American Books, Farrar, Straus and Giroux, 2012); Trewavas, A., *Plant Behaviour and Intelligence* (Oxford: Oxford University Press, 2014); Mancuso, S., and Viola, A., *Brilliant Green: the Surprising History and Science of Plant Intelligence* (Washington DC: Island Press, 2015).
- [21] Castro, T., “The Mediated Plant”, *E-flux Journal*, September 2019: <https://www.e-flux.com/journal/102/283819/the-mediated-plant/> (last accessed November 1st, 2019).
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- [23] Darwin, Ch., *The Power of Movement in Plants*, London, John Murray, 1880.
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- [25] *Ibid.*, p. vii.
- [26] Daston, L. and Galison, P., *Objectivity*, New York: Zone Books, 2007, p. 121.
- [27] Bose, *op. cit.*, p. viii.
- [28] Wiener, R., *Cybernetics, or control and communication in the animal and the machine*, Paris: Hermann & Cie, 1948.
- [29] Wiener, R., *The Human Use of Human Beings. Cybernetics and Society*, London: Free Association Books, 1989, p. 23.
- [30] Bose, *op. cit.*, p. 235.
- [31] Bose, *op. cit.*, p. 71 and p. 73.
- [32] In English, the appellation “telegraph plant” goes back, at least, to the mid 19th century. A passage from the American journal *The Horticulturalist* suggests, in 1856, that the expression originated in Bengal (*The Horticulturalist and Journal of Rural Art and Rural Taste*,

- v. 11, 1856, p. 243). “Telegraph plants” were also known as “Semaphore plants”: the first use of the word *semaphore* in reference to English use was in 1816. Presumably, the appellation “Telegraph Plant” must have appeared between this date and the 1850s, as “semaphoric telegraphs” were built all around Europe and India.
- [33] Copies of these films are held at the Gaumont Pathé Archives, Paris.
- [34] As quoted in Tompkins and Bird, *op. cit.*, p. 78.
- [35] *Ibid.*, p. 80.
- [36] Lawrence, L. G., “Electronics and the Living Plant”, *Electronics World*, October 1969, p. 28.
- [37] Tompkins and Bird, *op. cit.*, p. 79.
- [38] The German plant physiologist Wilhelm Pfeffer made four time-lapse films between 1898 and 1900, corroborating some of Darwin’s contested ideas on plant sensitivity and irritability. On these early plant-motion films, see Gaycken, O., “The Secret Life of Plants. Visualizing Vegetative Movement 1880-1903”, *Early Popular Visual Culture*, vol. 10, n^o 1, February 2012, p 51-69.
- [39] Colette, “Cinéma [Magie des films d’enseignement]” (1924), in *Colette et le cinéma*, Paris: Fayard, 2004, p. 369.
- [40] Bilinsky, B., “Le costume”, *L’Art Cinématographique*, Paris: Félix Alcan, 1929, p. 56.
- [41] See Castro, T. “À l’écran, le végétal s’anime: cinéma, animisme et sentience des plantes”, in Castro, T., Pitrou, P. and Rebecchi, M. (eds.), *Puissance du végétal et cinéma animiste. La vitalité révélée par la technique*, Dijon, Presses du réel, 2020, p. 41-73.
- [42] Tompkins and Bird, *op. cit.*, p. 78
- [43] Tompkins and Bird’s book doesn’t refer to the Dogon, but in 1976 Robert K. G. Temple had made popular the thesis according to which the latter had been in touch with intelligent extraterrestrial beings from the Sirius star system (cf. Temple, R. K. G., *The Sirius Mystery*, New York: St Martins Press, 1976).
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- [45] See “Bio-Sensing art in the 1970s. Data Garden Interviews Bio-Art Pioneer Richard Lowenberg”, *Data Garden*, September 20, 2011: <https://www.datagarden.org/post/richard-lowenberg-interview> (last accessed November 1st, 2019). Images turned for the sequence have been made available by Lowenberg on <https://www.youtube.com/watch?v=OR4ZNV3hU7o> (last accessed November 1st, 2019).
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- [48] The composition and audience reactions are audible at: https://archive.org/details/RE_1972_10_18 (last accessed November 1st, 2019).
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- [50] Downey, J., “Technology and Beyond”, *Radical Software*, vol. 2, n^o 5, Winter 1973, p. 2.
- [51] Produced by Anglia Television, *Tales of the Unexpected* was aired on British ITV aired between 1979 and 1988.
- [52] The episode is called “Daisies”. *Darkroom* was produced by Universal Television and aired on ABC in 1981-1982.
- [53] On such films see Knee, A., “Vegetable Discourses in 1950s Science Fiction Film” (in Keetley, D. and Tenga, A., *Plant Horror. Approaches to the Manstrous Vegetal in Fiction and Film*, London: Palgrave MacMillan, 2016, p. 145-162); Howe, A., “Monstrous Flora: Cinematic Plant Antagonists of the Post-World War II Era” (in Vieira, P. and Gagliano, M., *The Green Thread: Dialogues with the Vegetal World*, Lanham: Lexington Books, 2016, p. 147-163); and Adamson, J. and Sandilands, C., “Thinking Plant Politics with *The Day of the Triffids*” (in Gagliano, M., Ryan, J.C, Vieira, P. (ed.), *The Language of Plants*, Minneapolis: University of Minnesota Press, 2017, p. 234-252).
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Exhibiting plants: Curating the gaze on vegetal beings

The current proliferation of work in plant studies includes a host of exhibits that focus on the vegetal. Whether it is in US campus museums at the Universities of Kansas and Arizona or collaborations by German houses like the Wilhelm-Hack-Museum and the Hygiene-Museum Dresden, curators—often in collaboration with academics—seem to be on a mission to cure plant blindness. This article reviews plant exhibits geared at the general public taking place in Germany, the US, the UK, and France between 2018 and 2020, and it analyzes how these shows contribute to the field of plant studies with publications and online offerings.

text by Joela Jacobs

The contemporary turn toward plants in both popular and academic culture has drawn the public not just into forests and fields, but also exhibition spaces. Several large plant-focused exhibits have taken place across the US and Europe in 2018 and 2019 alone. Their accompanying events and publications have contributed both to the ongoing scholarly work and the public perception of the importance of plants. Rather than only focusing on the beauty of plants, these exhibits draw on a range of ideas from recent research to ancient knowledge to make apparent to visitors the many ways in which human life is entangled with the vegetal. They are on a mission to cure what Wandersee and Schussler have described as “plant blindness” and add to the responses assembled in a 2018 collection asking *Why Look at Plants?*, edited by Giovanni Aloï.¹ This essay will take readers into several exhibits, primarily in Germany and the US, but also point to shows in the UK, France, and online in order to analyze the many different approaches and strategies of mediating encounters with our vegetal kin through art and language. In doing so, the piece asks about the ways in which these exhibits reflect the human imagination of plants, with a particular focus on the entangled human-plant relationships that emerge from these examples.

Germany: Of Plants and People

Deutsches Hygiene-Museum Dresden has a complicated history. Founded in 1912 by a mouthwash heir, the museum provided public access to modern health information, but was also instrumentalized by the Nazis for their propaganda of racial hygiene (a fact that the museum openly and critically addresses). Today, its permanent exhibition *The Human Adventure* is paired with well-researched, large-scale thematic shows. From April 2019 to April 2020, the temporary exhibit was *Of Plants and People: A Stroll Around Our Green Planet*, curated by Kathrin Meyer.² The bilingual German/English exhibition features three parts: “To the Roots”, “Sowing and Reaping,” and “Living in the Planetary Garden.” The accompanying book leads through the show and intersperses approachable German-language essays written by scholars with poetry, short prose excerpts, and images of the artworks on display.³

The exhibition is as much about knowledge as it is about art. Renée Sintenis’ (1888-1965) sculpture *Große Daphne* (Big Daphne, 1930) greets the visitor



Hygiene-Museum Dresden

Visitors of the exhibit *Of People and Plants* about to spin the flower language wheel. Photo by Oliver Killig for Stiftung Deutsches Hygiene-Museum Dresden, 2019

alongside a bookshelf that features various plant-related volumes. A wheel of fortune with flowers that tells the onlooker what a specific blossom would have communicated in the Victorian language of flowers is placed next to *Toiletten-Orchidee* (*Orquidea toiletts*), a faux orchid “made in China” and “discovered” in the entrance area of a public bathroom in Cologne in June 2018. This piece is part of *Herbarium künstlicher Pflanzen* (Herbarium of Artificial Plants), a collection of artificial flower specimens from around the world that Alberto Baraya archives like an eighteenth-century botanist, and it hangs close to some of the famous black-and-white photographs of ornamental plant patterns by Karl Blossfeldt (1865-1932).⁴ Nearby is an auxanometer, a machine with which plants document their own growth, and another turn reveals a station with music recorded for plants, like Mort Garson’s *Mother Earth’s Plantasia: Warm Earth Music for Plants... and the People Who Love Them* (1976). Further ahead, a xylotheque with wooden books mesmerizes the bibliophile. Despite the wealth of materials that leave the visitor to choose their own path through the well-contextualized artworks and objects among black walls, the rooms’ deliberate use of light amplifies the focus on senses like sight and sound, such as in the audiovisual installation *Treelab* (2015/17) by Marcus Maeder (with Roman Zweifel) that plays a symphony of crackling sounds from inside of trees while showing videos of the corresponding forest. Similarly engaging, the interactive installation *Titanwurz* (*Corpse Flower*, 2016) by Niklaus Heeb and Alessandro Holler invites visitors to participate in the growth cycle of a blossom through their body movements. As is the conundrum for all museum spaces, there are no living plants to touch, smell, or taste, but the mu-