ACUPUNCTURE & ELECTRO-THERAPEUTICS RES., INT. J., Vol. 47, pp. 279-290, 2022

0360-1293/22 $60.00 + .00
https://doi.org/10.3727/036012921X16341481788230

THE PLANT CONSCIOUSNESS: UNDERSTANDING AND DEVELOPING PROTO-LANGUAGES BETWEEN PLANTS AND HUMANS

Stefano Turini, MBioLSc, Ph.D.,

Senior Lecturer in Biochemistry and Microbiology, School of Physiotherapy, AMEU-ECM University, Maribor, Koper, Project Manager UNIQUE Treatments, Main Researcher / Principal Investigator at BDORT Center of Functional Supplementation and Integrative Medicine, Belgrade, Serbia, Italy-Slovenia-Serbia

Momir Dunjic, MD, Ph.D., F.I.C.A.E., Cert MD-ORT (4DAN)

Associate Prof of Ob/Gyn & Integrative Medicine at School of Medicine, University of Pristina in Kosovska Mitrovica, Faculty of Pharmacy, Novi Sad, Faculty of Health Science, AMEU-ECM Maribor, President of Serbian Association of Integrative Medicine, President Serbian Acupuncture Section of Serbian Medical Society, Slovenia-Serbia

Biljana Vitosevic, Ph.D.,

Full Prof at Faculty of Sport and Physical Education, Leposavic, University of Pristina in Kosovska Mitrovica, Serbia

Tatjana Novakovic, MD, Ph.D.,

Full Prof and Dean at School of Medicine, University of Pristina in Kosovska Mitrovica, Serbia

Marija Dunjic, MD

PhD Student, School of Medicine, University of Belgrade, Serbia

Dejan Krstic, Ph.D.,

Full Prof at Faculty of Environmental Safety, University of Nis, President of Non-Ionizing Radiation Section of Serbian Association of Integrative Medicine, Serbia.

Katarina Dunjic, MD,

PhD Student, School of Medicine, University of Belgrade, Serbia

Contact: Stefano Turini, Cell phone: +381 60 3650150; e-mail: turini.stefano@yahoo.it

(Received on December; Accepted with revision:)

ABSTRACT

Plants are among the oldest and most complex organisms on our world. The complexity lies, first of all, from the cellular point of view, which has a greater compartmentalization than the animal cell. Also evolved as terrestrial organisms, plants have developed complex forms of electrochemical communication, developed to the point of suggesting that plants possessed a sort of nervous system, similar to that found in the animal world and in organisms with a high degree of evolution. Over the course of history, numerous researchers, especially in the last century, have alternated trying to penetrate the functional complexity of plants, obtaining results that allowed to tip the scales towards the presence not only of a nervous system, but a complex processing capacity, comparable to a consciousness. The experiment described here, using a polygraphic apparatus connected to an artificial intelligence computerized processing system, made it possible to evaluate the physiopathological responses of a plant subjected to external stimuli of an invasive and non-invasive nature. The technique involved addressing the vegetable "directly" during the experimentation. The results obtained have highlighted a logical succession of responses, which have allowed us to conclude that plants possess an advanced capacity for processing external stimuli and also of the human voice.

Key words: Artificial intelligence; Polygraph; Primary perception; Global consciousness; Plant neurophysiology; Plant neurobiology; Tower buster

INTRODUCTION

Plants or plant organisms are the oldest cellular life forms present on our world. It states "cellular life forms" as in Systematics, there are also acellular life forms such as Viruses, which enter the Aciyota Domain. Appeared in the form of Cyanobacteria, therefore unicellular, about 3,500,000,000 years ago, before the continental drift and in the presence of the only great ocean called Panthalassa, they rapidly transformed the physicochemical conditions of ocean waters, introducing oxygen and metabolizing the carbon dioxide, through a series of organic reactions, carried out through chlorophyll photosynthesis. These reactions have also allowed the creation of trophic chains, also called food chains, with primary producer organisms such as plants at the base. The transition from aquatic to earthly life, for vegetables, took place with the appearance of pioneer plants, with absent stems but with a great capacity to store water, such as mosses, sphagnums and liverworts, defined Bryophytes. Subsequently, the Pteridophytes appeared as: ferns, equisedi and lycopods. The first ferns, which appeared between the end of the Triassic and the beginning of the

Jurassic, had a tall trunk. The superior plants, equipped, among other things, with tall stems, appeared since the Late Jurassic, at the beginning of the Mesozoic period, about 180-190 million years ago, quickly colonized the emerged lands, such as Angiosperms, increasing the content of oxygen in the atmosphere of the Earth of the Jurassic period. The real revolution took place in the Middle Jurassic, about 150 million years ago, with the appearance of flowering plants, the Gymnosperms, which gave way to a whole new series of intraspecific and interspecific interactions. One of the most famous is represented by the forms of entomophilia pollination, in which it is the Insects, existing for at least 400 million years before the Bryophytes, to help the higher plants in their reproduction, and to transport the pollen, no longer entrusted only to the wind, in wind pollination. One of the most peculiar characteristics of plant organisms is that they have developed forms of chemical and sensory interaction with the surrounding environment. These interactions occur both for the aerial portion of the plant, i.e. the one that rises from the ground, and for the underground portion, represented by the roots, in which there is a whole universe of direct and chemical connections with the soil, with organisms and with other roots. A characteristic example is represented by the Amazon Rainforest, where there are at least 500 billion plants, each with a more or less complex root system.

Throughout the last century, a new generation of scientists has approached the world of plants with a new approach, in order to determine how plants communicate with each other, with the surrounding environment and with the animal world. Surely, among the characters that should be counted most is Luther Burbank, who, with a training that stopped at the level of higher education, developed 800 strains of new plants including fruits, flowers, seeds and herbs, among which, a famous variant of cactus without thorns. His operating methodology did not include the use of cutting-edge equipment, but reflected the attention, care and respect he had for these plants. In many interviews he gave he stated that his main secret was that he could talk to plants while he worked with them and/or made new grafts [1-5]. Undoubtedly one of the most striking examples of interaction-reaction between plants and animal organisms is represented by the *Mimosa pudica*, a vegetable for which, at the only delicate touch on the external surface of the leaves, produces a closure of the same [6].

In the wake of the Burbank studies but with a completely different approach, which made use of technological tools, there was the famous CIA analyst and interrogation expert, Cleve Backster. He can be defined as the first to have created a connection between technology and the plant world and counted among the founders of the discipline known as Biopsychocybernetics. In his first experiment, Backster decided to connect his polygraph (lie detector) to a vegetable and discovered, to his surprise, that the needle responded, giving signals as if there was a connected subject. On the strength of these first results, Backster decided to extend the experiments, placing two plants, of the same species, close to each other and connecting the polygraph to only one of the two. A group of five subjects was also chosen whose one was chosen that he would have had to rage on the vegetable not connected to the polygraph. Subsequently, the conque subjects were made to stop in front of the vegetable not connected to the polygraph, until the “culprit” was reached. For

all those who had not raged on the first vegetable, the second, connected to the polygraph, did not show the minimum output signal as the polygraphic trace remained constant. Upon arrival of the "guilty" subject, the connected vegetable began to produce a pattern that quickly went off-scale. What had happened? Had the vegetable identified in that subject the author of the killing of the first plant? [7-12]. Backster is counted as the discoverer of the so-called Primary Communication and his experiments were along the lines of those already carried out in 1900 by the Indian biologist, physicist and botanist Jagadish Chandra Bose. Some of his experiments concerned the study of the electrical spasm that was generated at the end of the life of plants [13-18].

Starting with Cleve Backster, the technology applied to plants has further refined and, at the turn of the 1970s of the last century, a French physicist and musician, Joel Sternheimer, introduced a completely new concept regarding a newborn discipline but one that would have been destined to take notable steps forward, namely Plant Biosensoring. Sternheimer assumed that each single molecular species possessed its own bioresonance frequency or Brownian motion frequency, as introduced by Albert Einstein, and that, with the aid of particular, very sensitive instruments, it could be registered. Therefore, he recorded the frequencies of the twenty basic amino acids and of the five nucleotides (also counting Uracil as a substitute for Thymine in the RNA) and at that point he had an intuition: comparing the bioresonance frequencies of the molecules with the musical notes they had similarities, however, with only seven basic musical notes it was not possible to cover the entire series of molecules, which were in total 25. The problem was solved by considering the harmonics of these notes, i.e., multiples and/or submultiples of the note itself. At that time, the frequencies of the molecules were associated with harmonics, with minimal deviation. It was therefore possible to convert a gene sequence (nucleotides) and/or protein (amino acids) into musical notes. Once the sequence was composed, what would have happened if it had been sent to a vegetable? Sternheimer realized that if a vegetable was lacking in a particular protein and, by sending the musical sequence, corresponding to this protein, as sound, at the level of the vegetable itself, it was possible to obtain a more luxuriant growth. This discovery paved the way for the conception of Molecular Memory, which was later taken up by numerous research groups [19-24].

Coming to the present day, independent research groups and/or belonging to academic institutions continue their research on plant biosensoring, increasingly approving the discourse on plant neurobiology, a concept introduced by the Italian botanist Stefano Mancuso. With his experiments, Mancuso laid the foundations for the understanding of how a system of uptake of external stimuli by a vegetable can be associated with the plausible presence of a complex organization comparable to a vegetable nervous system [25-28]. Independent researchers such as the Italian sociologist Valerio Sanfo, founder and director of the Popular University A.E.ME.TRA. (http://www.valeriosanfo.it/), based in Turin, Italy, and the philosopher Oberto Airaudi (https://www.damanhur.foundation/falco-oberto-airaudi/), creator and founder of the community Damanhur (https://www.damanhur.foundation/), known worldwide, have conducted experiments with the aim of being able to demonstrate the response of plants, in interaction with the surrounding environment.

MATERIALS AND METHOD

The assembly diagram of the equipment basically consists of three components: a 15.6-inch TOSHIBA Satellite Pro L300-13Z PC System computer/laptop, a digital polygraphic system such as USB Poligraph, with a 2.5 Gb minimum RAM, a minimum processor speed of 1.5 GHz, and a minimum hard drive space of 20 Gb. The system was directly supplied with artificial intelligence software (automatic learning software), with complex signal reprocessing capabilities and equipped with SAPS technology, i.e., Algorithmic Reprocessing of Signals or Software System for Inductive Modeling. As a radioactive source, it has been used 5 g of UO_2 (uranium dioxide or uraninite, with an equivalent dose value of radiation of 2.5 mRem, or 0.025 mSv), a Tesla Transformer, with ddp output from the secondary circuit of 20,000 volts, and 0,025 A as current intensity and one specimen of Tower Buster or Orgonite (instrument capable of cleaning up the negative environmental orgone radiation or DOR, converting it to OR). Exemplary of orgonite, realized by author Stefano Turini, was made by combination of two natural resins; Omani incense and myrrh, using gold leaf metal as a metal. The use of the Tower Buster, in accordance with the results obtained from the experiments of the Austrian psychoanalyst Wilhelm Reich, in the description of the Oranur Experiment, should reduce the effects given by the ionizing radiation, emitted by a radioisotope, thanks to the increase of the orgone charge [data not shown].

The experimental protocol aimed to initially put the plants in contact, or only one, with the polygraph, and to ask control questions, in which the operator addressed the plant directly, talking to it, so as to be able to exploit the phenomenon of biosensing. The polygraph therefore received output signals, which appeared on the screen as graphs with open broken lines, referred to values such as: pulse, sweat and breath. The first interesting value was provided by the fact that, by connecting this instrument to the vegetable, a response of: pulse = 118 bpm, sweat = 100% and breath = 25% was recorded. These first data have shown the basic physiology of the plant in which parameters such as sweat and breath, normally associated with a person, translated at the plant level, represent the percentage of accumulated humidity and the transpiration value. For the impulse, the hypotheses still remain open but we have formulated the hypothesis that it is the ddp value measured at the level of the plant stem, as if it were the skin galvanization value, measured at the level of the stem surface of the *Euphorbia pulcherrima*. The operator generated a random answer according to the question posed by the same and it was then up to the software to re-elaborate the question and the answer according to the answer given by the vegetable.

The figures shown below (not numerated, as an identification series) show the assembly diagram of the equipment and the plants used. The purpose of the experiment was to compare the processing of the responses, extrapolated from the polygraph, from the control sample, i.e., the plant *Euphorbia pulcherrima* in the absence of any form of treatment, and the treated samples. For the *Euphorbia pulcherrima* the experiments involved the treatment with a sample that consisted of 5 g of uranium dioxide (UO_2 or uraninite), with an equivalent radiation dose value estimated to be around 0.025 mSv. The experimental hypothesis consisted that the plant was affected by ionizing radiation, made up of beta and gamma particles. After depositing the uranium dioxide sample at

the plant level, the operator would ask direct questions to the plant itself and the software would elaborate the nature of the answers, based on the biometric parameters provided by the plant. In order to eliminate the effects of irradiation, at the level of the same plant (*Euphorbia pulcherrima*), one example of Tower Buster or Orgonite, has been deposited. The aim was to compare the answers provided by uranium dioxide and orgonite and to be able to determine whether one or both could be effective in eliminating the effects of ionizing radiation on plants. This experiment was carried out on a reduced cove, with a view to a possible large-scale application for the decontamination of the woodlands of interest to its flora and fauna.

RESULTS

The results of the experiments will be provided below, through the interpretation of the following images.

***Fig. 1: Euphorbia pulcherrima*, uranium dioxide (UO_2), Tower Buster (orgonite)**

From left to right, we have the following images: the first image on left represents the subject plant, the *Euphorbia pulcherrima* connected to the polygraph, in which the electrode cables can be seen. The image at the center represents the *Euphorbia pulcherrima* with the capsule of uranium material (uranium dioxide) used in the experiments next to it. The right image represents the plant *Euphorbia pulcherrima* connected with the Tower Buster, a model conceived and developed by the author Stefano Turini.

First series of results of experiment: *Euphorbia pulcherrima* + uranium dioxide (UO_2):

Questions	Answer of operator	Software's elaboration
(***Are you alive?)***	Yes	Lie
(***Are you a vegetal?***)	Yes	Truthful
(***Are you afraid of me?)***	Yes	Truthful
(***Do you have consciousness of yourself?)***	Yes	Truthful
(***Do you know what is uranium?***)	Yes	Truthful
(***Do you feel yourself bad?***)	Yes	Lie
(***Are you affected by radiations?***)	Yes	Truthful
(***Do you want that I remove uranium?***)	Yes	Truthful

Through a first logical-psychological analysis of the interpretation of the answers we can conclude, after the application of the uranium dioxide capsule, that the answers conformed to the experimental hypothesis. To the first question, Are you Alive? the operator, giving a positive answer, the software interpreted it as a lie. Which is logical since, in the presence of the radioactive material, the vegetable may no longer feel alive. When asked for control, Are you a vegetable? The answer Yes has given a positive result as it allows us to advance the supposition that the vegetable is aware of its nature. The next question, Are you afraid of me? The response generated by the operator was Yes, and the software confirmed it. From a first interpretation, the vegetable, feeling threatened by the presence of a harmful external stimulus, must have concluded that the primary source of the disturbance, that is the operator, is a threat. The next question is the most important of the whole experiment: Are you aware of yourself? To the answer Yes, the artificial intelligence software responded positively. This is a second clue that points us towards the conception that plants can have self-awareness, which would be a clue in favor of the existence of a vegetable nervous system. The next question confirms the previous one, that is, Do you know what is uranium? To the answer Yes, the software has further confirmed. Therefore, the vegetable in question seems to be aware of the nature of the external stimulus. To the question, Are you feeling bad? the answer was generated Yes it is the software interpreted it as not true since, it seems that the vegetable, despite the negative stimulus given by the radioactive material, is not

affected, yet, enough to warn external effects. It should be remembered that the radioactive material was kept for a total duration of 30 minutes. To the question, Are you affected by radiation? and to the answer given Yes, the software has provided a positive answer and this further confirms that the vegetable is affected by radioactivity and has a sort of awareness of being affected by it. Finally, another important question, Do you want me to remove the uranium, to the answer Yes, the program has given a confirmation, which provides the further data that the vegetable, being affected by the ionizing radiation, "wants" it to be removed.

Third series of experiment: *Euphorbia pulcherrima* + natural orgonite [(resin of incens + myhrr) + gold] (Turini's model):

Questions	Answer of operator	Software's elaboration
(*Do you know what is orgonite?)*	Yes	Truthful
(*Are you affected positively from orgonic radiation?*)	Yes	Truthful
(*Do you feel yourself bad?)*	No	Truthful
(*Are you affected negatively from orgonic radiation?*)	No	Truthful
(*Are you feel alive?*)	Yes	Truthful
(*Would you like that I will remove orgonite?*)	No	Truthful

This re-elaboration represents one of the most important results obtained in terms of subliminal plant communication as it has made it possible to obtain a sequential and logical-sequential re-elaboration of the language expressed by the plant in terms of bioelectric impulses and reworked by artificial intelligence software (automatic learning). By placing the type of natural orgonite, the vegetable responded positively from a physiological point of view. To the first question, do you know what orgonite is? and, when answered Yes, the software provided a positive automatic reprocessing. The vegetable, plausibly, must have interpreted the presence of orgonite as positive and must have learned to recognize it. THEREFORE, IT IS POSSIBLE TO SUPPOSE THAT, EVEN FOR VEGETABLES, LEARNING IS BASED ON EXPERIENCE, AS FOR ANIMAL ORGANISMS. Therefore, LEARNING IS EXPERIENTIAL. The vegetable has learned to recognize orgonite. To the second question, are you positively affected by orgone radiation? And, to the answer Yes, the software has provided a positive reworking, as, evidently, the vegetable has begun to be positively affected by the orgone radiation. Whether it derives from experiential learning or from the fact that two orgonites have alternated and, therefore, the environment and

the plant have been cleaned of EDOR, with an increase in the concentration of EOR, we are not yet able to say with certainty. To the third question, are you feeling bad? An answer was given No and the computer processed it as affirmative, as the vegetable has recovered its functions and no longer feels unwell. To the fourth question, are you negatively affected by orgone radiation? The answer given was No and the software provided another affirmative reworking, as the vegetable, in accordance with the previous questions, feeling good, is a logical and logical-algorithmic consequence of being positively affected by orgone radiation. The fifth question, Do you feel alive? The computer gave a positive reworking, as, again by logical succession, the increase in functionality of the vegetable, made it feel alive. Note that the question, Do you feel Alive? this is a complex question, since the term Viva contains many meanings and even more can be the possibilities of interpretation. Therefore, asking the vegetable a similar question means presupposing a complex elaboration by the vegetable itself. The last question, do you want me to remove the orgonite? When the operator answered No, the software provided a positive/affirmative answer, as the vegetable is now positively affected and has entered into harmony with the orgonite itself. The assumption is also that natural orgonite, created from plant resins such as frankincense and myrrh, is more in resonance with the plant than a synthetic resin composed mostly of urethane-polyurethane. Moreover, the conductor metal is gold, which, as a noble metal, has a higher level of electrical conductivity than the aluminum of the previous orgonite. In fact, aluminum has an electrical conductivity value of 3.5×10^7 S/m at 20°C of temperature. Gold has an electrical conductivity of 4.10×10^7 S/m, always at 20°C.

DISCUSSION

The experimentation reported here had two purposes, divided into two different experimental sessions: the first experiment, with uranium dioxide and Tower Buster, aimed at verifying whether the plant responded to external invasive stimuli, and whether, through the artificial intelligence software, equipped with the polygraph, it was possible to process the impulses provided by the vegetable, so as to find a logical succession of impulses that could be translated into a form of language. The results of the re-elaborations, provided by the automatic learning program, have made it possible to highlight how the vegetable not only receives and processes external stimuli, but also supports them, adapting to the conditions in a specific time, highlighting a configuration in the environment that, until now, it had not yet been found, not at that subliminal level at least.

CONCLUSIONS

The elaboration of the answers provided in the first and second experimentation, by the artificial intelligence software, have provided the unequivocal result that the vegetable not only responds to external stimuli, but also to the human voice. Therefore, following all the data obtained and their consequent re-elaboration, we are able to formulate the hypothesis of the existence of a form of consciousness in the tested plant, such as *Euphorbia pulcherrima*. In this we see the possibility of being able to begin the elaboration of a sort of protolanguage to open a channel of direct communication with the plant world.

ACKNOWLEDGMENTS: Authors and co-authors would like to thank members of the BDORT Center team in Belgrade, not mentioned as direct participants of the research, and we also want to declare the absence of conflicts of interest during the execution of all the research and application work.

REFERENCES

1. Luther Burbank. Half-hour experiments with plants. P.F. Collier & Son company. EPUB Edition, New York.
2. Luther Burbank. Plant Breeding. How plants are trained to work for man. Volume I, Eight Volumes, Illustrated, Prefatory Note by David Starr Jordan P.F. Collier & Son company. EPUB Edition. New York
3. Luther Burbank. Grafting and Budding. How plants are trained to work for man. Volume II, Eight Volumes, Illustrated, Prefatory Note by David Starr Jordan P.F. Collier & Son company. EPUB Edition. New York
4. Luther Burbank. Fruit Improvement. How plants are trained to work for man. Volume III, Eight Volumes, Illustrated, Prefatory Note by David Starr Jordan P.F. Collier & Son company. EPUB Edition. New York
5. Luther Burbank. Small Fruits. How plants are trained to work for man. Volume IV, Eight Volumes, Illustrated, Prefatory Note by David Starr Jordan P.F. Collier & Son company. EPUB Edition. New York
6. Hermann Schildknecht. Uber die Chemie der Sinnpflanze *Mimosa pudica L*. Mit 22 zum Teil farbigen Abbildungen. Vorgelegt in der Sitzung vom 10 juni 1978. Springer Verlag Berlin Heidelberg New York 1978. ISBN-13: 978-3-540-09290-2. DOI: 10.1007/978-3-642-46402-7. e-ISBN-13: 978-3-642-46402-7.
7. Silvia Perotto, Frantisˇek Balusˇka. Signaling and Communication in Plant Symbiosis. ISSN 1867-9048 E-ISSN 1867-9056, ISBN 978-3-642-20965-9 E-ISBN 978-3-642-20966-6, DOI 10.1007/978-3-642-20966-6, Springer Heidelberg Dordrecht London New York. Library of Congress Control Number: 2011938275, Springer-Verlag Berlin Heidelberg 2012.
8. J. Benjamin Miller and Giles E.D. Oldroyd. The Role of Diffusible Signals in the Establishment of Rhizobial and Mycorrhizal Symbioses. DOI 10.1007/978-3-642-20966-6. Springer Heidelberg Dordrecht London New York.
9. František Baluška, Soumya Mukherjee, Akula Ramakrishna. Neurotransmitters in Plant Signaling and Communication. ISSN 1867-9048 ISSN 1867-9056 (electronic). Signaling and Communication in Plants, ISBN 978-3-030-54477-5 ISBN 978-3-030-54478-2 (eBook), https://doi.org/10.1007/978-3-030-54478-2, © Springer Nature Switzerland AG 2020.

10. František Baluška, Soumya Mukherjee, Akula Ramakrishna. Neurotransmitters in Plant Signaling and Communication. ISSN 1867-9048 ISSN 1867-9056 (electronic). Signaling and Communication in Plants, ISBN 978-3-030-54477-5 ISBN 978-3-030-54478-2 (eBook), https://doi.org/10.1007/978-3-030-54478-2, © Springer Nature Switzerland AG 2020.

11. František Baluška, Velemir Ninkovic. Plant Communication from, an Ecological Perspective. ISSN 1867–9048 e-ISSN 1867–9056, ISBN 978-3-642-12161-6 e-ISBN 978-3-642-12162-3, DOI 10.1007/978-3-642-12162-3, Springer Heidelberg Dordrecht London New York, Library of Congress Control Number: 2010923084, # Springer-Verlag Berlin Heidelberg 2010.

12. James D. Blande, Robert Glinwood. Deciphering Chemical Language of Plant Communication. ISSN 1867-9048 ISSN 1867-9056 (electronic), Signaling and Communication in Plants. ISBN 978-3-319-33496-7, ISBN 978-3-319-33498-1 (eBook), DOI 10.1007/978-3-319-33498-1. Library of Congress Control Number: 2016947068. © Springer International Publishing Switzerland 2016.

13. J.-C. Bose. Sur la réponse électrique de la matière vivante et animée soumise à une excitation. - Deux procédés d'observation de la réponse de la matière vivante. HAL Id: jpa-00240632. https://hal.archives-ouvertes.fr/jpa-00240632. Submitted on 1 Jan 1902.

14. Sir Jagadis Chunder Bose. Plant Autographs and Their Revelations. Longmans, Green and co. LTD. 39 Paternoster Road, London, E.C. 4, New York, Toronto, Calcutta, Bombay and Madras, 1927.

15. Sir Jagadis Chunder Bose. The Motor Mechanism of Plants. Longmans, Green and co. LTD. 39 Paternoster Road, London, E.C. 4, New York, Toronto, Calcutta, Bombay and Madras, 1928.

16. Sir Jagadis Chunder Bose. Comparative Electro-Physiology, A Physico-Physiological Study. Longmans, Green and co. LTD. 39 Paternoster Road, London, E.C. 4, New York, Toronto, Calcutta, Bombay and Madras, 1907.

17. Sir Jagadis Chunder Bose. Growth and Tropic Movements of Plants. Longmans, Green and co. LTD. 39 Paternoster Road, London, E.C. 4, New York, Toronto, Calcutta, Bombay and Madras, 1929.

18. Sir Jagadis Chunder Bose. The Nervous Mechanism of Plants. Longmans, Green and co. LTD. 39 Paternoster Road, London, E.C. 4, New York, Toronto, Calcutta, Bombay and Madras, 1926.

19. Joël Sternheimer, exposé au Colloque International "Louis de Broglie, Physicien et penseur", Ancienne Ecole Polytechnique, Paris, 6-7 novembre 1987; "Ondes d'échelle. I. Partie physique", pli à l'Académie des Sciences n° 17064 (juin 1992), ouvert en 1999.

20. Joël Sternheimer, "Procédé de régulation épigénétique de la biosynthèse des protéines par résonance d'échelle", brevet n° FR 92 06765 (1992), n° de publication 2691796, aujourd'hui délivré en France (13/7/95) et 16 autres pays (dont OAPI, Australie, Russie).

21. Joël Sternheimer, "Régulation épigénétique de la biosynthèse des protéines par résonance d'échelle", exposé à l'Académie des Sciences de Tokyo-Kanagawa (23/5/93). "Interactions non-locales dans l'expression des gènes", (extrait sur http://www.ecoropa.org/), 1997. http://www.bekkoame.ne.jp/~dr.fuk/InterNonlocF.html

22. Joël Sternheimer, in "Strong and weak interactions: present problems", 1966 International School of Physics 'Ettore Majorana', (ed. A. Zichichi), Acad. Press 1966, pp. 731 et suiv., 746-47, 752-53, 786-87, 800 (discussions avec S. Coleman, M. Gell-Mann et S. L. Glashow sur les masses des particules).

23. Joël Sternheimer, C. R. Acad.Sc.Paris 297, p.829, 1983 [Note présentée par André Lichnerowicz]; Séminaire de physique mathématique - A. Lichnerowicz, Collège de France (1984), reprod.in Rev. Bio-Math. 94, p.1, 1986. (Opérateur d'échelle exponentiel dans une dimension autonome vis-à-vis de l'espace-temps pour décrire les masses des particules, et sa déformation linéaire en quasi-échelle, rendant compte, par synchronisation, de la valeur de la constante observée par Schwinger; généralisation associée de l'équation d'ondes).

24. Joël Sternheimer, Le Cahier du Collège International de Philosophie 3, p. 180, Osiris, Paris (1987); "How ethical principles can aid research", Nature vol. 402, p. 576 (1999).

25. Monica Gagliano, Michael Renton, Nili Duvdevani, Matthew Timmins, Stefano Mancuso. Out of Sight but Not out of Mind: Alternative Means of Communication in Plants. PLoS ONE | www.plosone.org. May 2012 | Volume 7 | Issue 5 | e37382.

26. Stefano Mancuso. Measuring Roots An Updated Approach. ISBN 978-3-642-22066-1 e-ISBN 978-3-642-22067-8, DOI 10.1007/978-3-642-22067-8, Springer Heidelberg Dordrecht London New York, Library of Congress Control Number: 2011940210, # Springer-Verlag Berlin Heidelberg 2012.

27. František Baluška, Dieter Volkmann, Andrej Hlavacka, Stefano Mancuso, Peter W. Barlow. Neurobiological View of Plants and Their Body Plan. Communication in Plants, F. Baluška, S. Manusco, D. Volkmann (Eds.), © Springer-Verlag Berlin Heidelberg 2006

28. Stefano Mancuso and Alessandra Viola. Brilliant Green: The Surprising History and Science of Plant Intelligence. Washington, DC: Island Press, 2015. Pp. 192.