# Cleve Backster

Cleve Backster (1924–2013) was a polygraph expert known for his research into plant and cell biocommunication. From the late 1960s, Backster attracted considerable notice with experiments that he claimed demonstrated a degree of conscious awareness in plants, from which he developed his theory of 'primary perception'. Attempts at replication were mixed, and the findings remain controversial.

## Life and Career

Cleve Backster was born Grover Cleveland Backster Jr on 27 February, 1924 in Lafayette, New Jersey.1 He attended Rutgers Prep School in New Brunswick, New Jersey, then went on to Franklin and Marshall Academy in Lancaster, Pennsylvania.

After graduation he attended Texas University, intending to major in civil engineering. However, after the 1941 Pearl Harbor bombing he transferred to a Texas A&M Training Program and changed his major to psychology. He was selected to attend Middlebury College in Vermont, then run by the US Navy V-12 program, where he continued with a major in psychology.

He served in the navy throughout the war, being discharged in 1946. Soon after this he enlisted in the US Army Counter Intelligence Corps (CIC), becoming an instructor on interrogation techniques. This included lectures in his area of special interest, hypnosis. He impressed a visiting general by hypnotizing the general's secretary and asking her to remove a classified document and bring it to him, drawing attention to the potential of hypnosis for espionage. After this he became a specialist in hypno and narco-interrogation techniques. He also started to investigate the uses of hypnotism more widely, particularly in medicine.

After leaving the army in 1948, Backster commenced work at the CIA in Washington, DC. Here he developed an interest in the use of polygraph machines. He received training from Leonarde Keeler, one of the original developers of the use of the polygraph and became director of the Keeler Polygraph Institute in Chicago after Keeler's death. He continued to be involved in private polygraph training organizations from this time onwards.

He established his own commercial polygraph consultant business in Washington, DC and Baltimore, Maryland. In 1959, he returned to New York and founded what would eventually become the Backster School of Lie Detection, which is still in operation today. During this time he had established himself as an expert in the field using polygraphs and served as chairman of the Research and Instrument Committee of the Academy for Scientific Interrogation for eight consecutive years.2

In 1965 he founded the Backster Research Foundation, with the aim of 'conducting research related to the advancement of polygraph (lie detection) technique and the improvement of polygraph instrumentation.'3 The following year he performed an experiment involving the use of a polygraph on a plant in the office, curious to

ascertain what occurred on a polygraph machine as water was drawn up into the leaf. During the course of the experiment he noticed a correlation between his mental intention to burn a leaf and a distinct reaction on the polygraph chart. This suggested that the plant was somehow able to perceive and react to his thoughts.

Backster later described this as a life-changing moment,[4] and a tandem, more controversial career subsequently developed in which he continued to investigate what he dubbed 'primary perception', that is the 'presence of a yet undefined perception phenomenon in all cell life (plant and animal).'[5] He continued to pursue research in both polygraphs and primary perception until the end of his career.

Backster died in 2013. [6]

## Parapsychological Research

The remainder of this article focuses on Backster's contributions to parapsychology through his investigations related to primary perception. However, it is worth noting that he also contributed significantly to the science of polygraph research, where his investigations culminated in the development of the Backster Zone Comparison Technique. This was the first polygraph interpretation system to use a numerical evaluation and is still much in use.[7]

Backster's first published article about plant and polygraph experiments appeared in the *Journal of Parapsychology* in 1968.[8] Here he outlines his chance discovery of a correlation between the reaction of a plant on a polygraph chart to his intention (never carried out) to harm a leaf on the plant by burning it with a match. Further experiments, on both plant and animal cells, confirmed that this correlation was consistent enough to warrant further investigation. Based on the hypothesis that the plants were reacting to a perceived threat, he speculated that the unexpected termination of life nearby might elicit a strong response. This was explored in a series of experiments in which brine shrimp were killed by immersion in hot water while three plants were monitored by polygraph machines.

The experiment was set up to exclude the possibility that the experimenters might unconsciously affect the results. An apparatus was devised that enabled the shrimp to be dumped at random times (one of six possible time blocks) which would be recorded but which would not be known to the experimenters at the time. Three plants were attached to polygraph machines, which recorded the galvanic skin response (GSR) of their leaves.

The charts were then interpreted by a team of three, who did not know the times the shrimp dumps had occurred. Control runs were undertaken in which no life was terminated, and a fourth recording was obtained using a resistor instead of a plant leaf. Charts were interpreted without knowledge of the run they were related to, and chart activity was designated 'active' or 'inactive' on the basis of variation from tracing averages.

The overall results indicated significant correlation with chart activity and the termination of the shrimp. It was concluded that:

> The significance of the experiment results provides evidence of the existence of a yet undefined primary perception in plant life, indicates that animal life termination can serve as a remotely located stimulus to demonstrate this capability, and illustrates that this facility in plants can be independent of human involvement. 9

This radical finding, that plants were capable of something analogous to an emotional response, was challenging to mainstream science and caused controversy. However, Backster continued to develop his theory of primary perception, at the same time as defending it in forums such as at one hosted by the American Association for the Advancement of Science (AAAS) in 1975. He maintained a strong media presence, giving lectures and demonstrations of what became known as the 'Backster effect' (this usually referred to the plant-human interaction).

Backster's parapsychological work culminated in the publication of his book *Primary Perception: Biocommunication with Plants, Living Foods and Human Cells* published in 2003,10 a personal memoir that describes his research, its mixed reception by mainstream science and the media, and the interest it holds for the general public. In the book Backster describes experiments he undertook after noticing reactions in a plant to two simple actions: cracking an egg into a bowl and mixing strawberry yoghurt into plain yoghurt, both of which correlated significantly with spikes in polygraph recordings of nearby plants. In follow-up investigations he managed to obtain readings from the eggs and the yoghurt. To compensate for the absence of a firm surface in the case of the yoghurt he developed a system of electrodes and EEG equipment, a technique that he later used to test bacteria in aquariums and in Kombucha tea.

The results were encouraging and soon he turned his attention to human cells. He determined that the cells would need to be monitored in a remote location, away from the body they were obtained from. Initially he used sperm and then focused on white blood cells taken from the mouth (oral leukocytes).11

A series of experiments indicated a correlation between reactions of the cells (recorded using the EEG system similar to the one used for the yoghurt experiments) and moments of increased emotion in the person from whom the white cells were taken. These results were published in 1985 in the *Journal of Biosocial Research* with Backster as the main author and Stephen G White, a research associate at the Backster Research Foundation, as the second author. 12

The protocol they developed involved monitoring the white blood cells at a distance from the donor, who was concurrently engaged in activities conducive to eliciting strong emotions (such as a World War II veteran watching a television program about 'The World at War').13 The distance between the person and the location of his or her white blood cells ranged from meters up to a kilometre. Significant correlations were found between white blood cells activity and significant emotional content witnessed by the participants. The authors argued that the findings held important implications, concluding: 'Research into this biocommunication phenomenon could possibly lead to new avenues of knowledge

concerning genetics, immunology, the healing process and the mind-brain relationship.'14

## Replication: Plant/human

The publication in 1968 of Backster's initial findings elicited a strongly sceptical response inthe scientific community. However, they generated wide public interest following the description of his experiments in the bestseller *The Secret Life of Plants*,15 which was published in 1973.

In the years immediately following the initial publication, amateurs and scientists alike attempted to replicate what became known as the 'Backster effect', testing the claim that plants respond to human thought, and particularly intention to harm them. Their findings were mixed.

In the early 1980s, a group of Russian scientists pointed out that, while the effect had been frequently demonstrated, it was not infallible, and a breakthrough was needed that would increase its reliability.16

Following the failure of their initial replication attempts they introduced a new feature, using hypnotism to intensify and control the human subject's emotion. They then started to obtain significant correlations between the moment at which the hypnotist asked the subject to focus on either pleasurable or distressing scenes and the galvanic response of the plant's leaf. They subsequently achieved significant results in a series of laboratory experiments:

Altogether, 24 subjects, between the ages of eighteen and 24, participated in the experiments. They were all students at institutions of higher education in Moscow. The subjects were selected according to their susceptibility to hypnotic suggestion. Each subject participated in from ten to several dozen experiments. A total of over 300 experiments were done. The synchrony of changes in electrical potentials of the plants with the hypnotist's commands was so high that it could not be considered a mere coincidence, and it occurred in 21 out of 24 subjects.17 This remains one of the more substantial published replication efforts of the plant/human interaction.

Scientists were also concerned to eliminate normal explanations such as electrical interference or temperature fluctuations. An experiment run at the Stanford Research Institute in 1975 tested for the Backster effect in algae and plants. The researchers shielded the recording mechanism in a Faraday cage and tested to rule out plant micromotion. They concluded:

> Pilot experiments with the algae Nitella indicated that they were nonresponsive to the activity of human subjects in close proximity, and therefore experimentation with Nitella was terminated early in the program. With regard to plant sensors, however, experimental findings with twelve subjects indicated that the electrical activity of plants in close proximity to a human subject viewing slides of putative emotional content, although not in one-to-one correspondence with subject GSR, nevertheless did show in some

> cases (20%) statistically significant evidence of correlation with subject GSR. [18]

In summary, experiments that reduced the possibility of electronic interference from normal causes have replicated the Backster effect to a degree. A protocol that allows for full-scale 100% replication of the effects remains elusive. However, it remains uncertain whether this is achievable if subject, experimenter and even the plant are held to contribute significant factors that cannot be entirely controlled for.

## Replication: Plant/shrimp

An attempt to replicate the plant/shrimp experiments was made by a group of three scientists at Cornell University. The results were published in 1975 in *Science* in a paper entitled: 'Plant "Primary Perception": Electrophysiological Unresponsiveness to Brine Shrimp Killing'. The authors describe how they followed closely the basics of Backster's experiment, but also introduced additional controls, such as a Faraday cage to shield the plants as they were being recorded. They concluded that:

> We believe that we matched, and in several instances improved on, Backster's experimental techniques, such as controls, shielding, number of observations, methods of analysis, and number of shrimp killed per injection. We obtained no evidence of primary perception in plants. While the hypothesis will remain as an intriguing speculation one should note that only the limited published data of Backster support it. [19]

The experiment has since become a cornerstone of scientific rejection of Backster's claims with regard to plant/shrimp interaction, supporting the argument that his results had normal causes. In response, Backster argued that the experimenters failed to follow proper automation procedures, with the result that theirs was not a true replication attempt:

> The plants were in a holding room seven days in advance of their intended use. [The experimenters] then bathed the leaves with distilled water. Any kind of experimenter contact with the plants prior to the actual experiment usage can compromise the experiment by allowing prior attunement between the plant and the researcher rather than the more subtle stimulus provided by the death of the brine shrimp. [20]

Nevertheless, mainstream science has largely ignored Backster's plant/shrimp findings, on the basis of the failed replication attempt at Cornell.

A possible exception is a series of experiments reported in the paper 'Conditions That Appear to Favor Extrasensory Interactions Between Homo Sapiens and Microbes' published in the *Journal of Scientific Exploration* in 1990.[21] This included testing the response of individual microbes in relation to human attention and intention, also for the possibility of microalgae responding to the death of clones of the algae in a distant location. Significant correlation was obtained for the latter, however only in certain conditions: when the experimenters were directly involved

and enthusiastic, and knew the times when the clones were killed. When the protocol was formalized and automated, no significance was obtained.

The authors concluded that this was an indication of the 'experimenter effect', namely that the experimenter's intention and mood could have an effect on the outcome of a biological experiment. This is an independent finding of parapsychology, no less controversial than the Backster effect, and would impact heavily on the biological sciences if shown to be the case. (See Experimenter Effects.)

Backster's findings continue to be controversial both within the field of parapsychology and beyond, and they are not being followed up to any significant degree. Public interest meanwhile remains strong. Future research might focus on strengthening Backster's evidence for the plant/human interaction, and examining the possible role of the experimenter effect in the plant/shrimp experiment.

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## Literature


Backster, C. (1968). Evidence of a primary perception in plant life. *International Journal of Parapsychology* 10/4.

Backster, C., & White, S.G. (1985) Biocommunications capability: Human donors and in vitro leukocytes. *International Journal of Biosocial Research* 7/2, 132-46.

Backster, C. (2003). *Primary Perception: Biocommunication with Plants, Living Foods and Human Cells*. California, USA: White Rose Millennium Press.

Dubrov, A.P., & Pushkin, V.N. (1982). *Parapsychology and Contemporary Science*. English translation edition. New York & London: Consultants Bureau.

Horowitz, K.A., Lewis, D.C., & Gasteiger, E.L. (1975). Plant primary perception: Electrophysiological unresponsiveness to brine shrimp killing. *Science* 189/4201, 480.

Matte, J.A. (1996). *Forensic Psychophysiology using the Polygraph: Scientific Truth Verification*. J.A.M. Publications: New York.

Matte, J.A. (2010). A field study of the Backster zone comparison technique's either-or rule and scoring system versus two other scoring systems when relevant question elicits strong response. *European Polygraph* 4/2, 54-69.

Pleas, C.M., & Dey, N.D. (1990). Conditions that appear to favor extrasensory interactions between homo sapiens and microbes. *Journal of Scientific Exploration* 4/2, 213-31.

Puthoff, H.E., & Fontes, R. (1975). Organic Biofield Sensor, Electronics and Bioengineering Laboratory (Stanford Research Institute) S.R.I Project 3194 (Task 3), 32.

Tomkins, P., & Bird, C. (1973). *The Secret Life of Plants*. London: Harper & Row.

# Endnotes

## Footnotes

- 1. Matte (1996), 39.
- 2. Backster (2003), 16-20.
- 3. Backster (2003), 20.
- 4. Backster (1968), 329-30.
- 5. Backster (1968), 346.
- 6. Cleve Backster, R.I.P. *Anti-Polygraph.org*.
- 7. Matte (2010), 54-69.

- 8. Backster (1968).
- 9. Backster (1968), 34.
- 10. Backster (2003).
- 11. Backster (2003), 73-122.
- 12. Backster & White (1985), 132-46.
- 13. Backster & White (1985), 140.
- 14. Backster & White (1985), 144.
- 15. Tomkins & Bird (1973).
- 16. Dubrov & Pushkin (1982), 94.
- 17. Dubrov & Pushkin (1982), 97-98.
- 18. Puthoff & Fontes (1975), 32.
- 19. Horowitz et al. (1975), 480.
- 20. Backster (2003), 70.
- 21. Pleas & Dey (1990), 213-31.