EVIDENCE OF A PRIMARY PERCEPTION IN PLANT LIFE

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EVIDENCE OF A PRIMARY PERCEPTION IN PLANT LIFE

Cleve Backster *

INTRODUCTION

RESEARCH ON A PRIMARY PERCEPTION[1] in plant life was triggered by curiosity about a common botanical function. On February 2, 1966, immediately following the watering of an office plant, the author wondered if it would be possible to measure the rate at which water rose in a plant from the root area into the leaf. The availability of recording resistance bridge (wheatstone) instrumentation[2] allowed the author to apply this index as a possible means of reflecting the rate of moisture ascent. The pair of instrument electrodes could be attached to a leaf of the plant and, hypothetically, by so using the wheatstone bridge circuitry involved, the relative decrease in the plant leaf's electrical resistance—due to the expected increase in its moisture content—should be indicated by an upward trend of the ink tracing on the chart recording.

Deciding to pursue this hypothesis, the author secured an electrode on each side of the same leaf of a nearby *dracaena massangeana* plant by encircling the pair—the plant leaf sandwiched in between—with a rubber band. The plant leaf was successfully balanced into the circuitry, its electrical resistance falling within the 250,000 ohms resistance limit of the instrumentation being used. The plant leaf

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remained within this resistance range for the entire fifty-five minutes and forty-five seconds of chart time involved.

Contrary to the author's expectation, from the outset the plant leaf tracing exhibited a downward trend.[8] Then, after approximately one minute of chart time, the tracing exhibited a contour similar to a reaction pattern typical of a human subject experiencing an emotional stimulation of short duration (Fig. 1). Even though its tracing had failed to support the initial hypothesis, the plant leaf did manifest itself as a possibly unique source of data, the implied importance of which greatly exceeded that of the original interest.

As the initial observation of this tracing continued, the author's attention focused upon further exploration of the possibility of there being a similarity between certain aspects of the tracing then being derived from the plant and verified tracing segments specifically indicating emotional arousals in humans. The author decided that an attempt should be made to expose the plant to some equivalent to the "threat-to-well-being" principle, well-established for triggering emotionality in humans. An unsuccessful attempt was made to affect the well-being of the plant by immersing a plant leaf, adjacent to the leaf between the electrodes, into a cup of hot coffee.

After an approximately nine-minute interim, the author determined to make a more direct attempt by threatening the cell tissue being tested, i.e., the leaf between the electrodes. He decided to obtain a match to actually burn the plant leaf being tested. At the instant of this decision, at thirteen minutes fifty-five seconds of chart time, there was a dramatic change in the tracing pattern in the form of an abrupt and prolonged upward sweep of the recording pen (Fig. 2). Because of his relative lack of body movement at that moment, and also his absence of physical contact with the plant and with the instrumentation, the precise timing of the pen activity suggested to the author that the tracing might have been triggered into such action by the mere thought of the harm he intended to inflict upon the plant—in fact, upon the very leaf between the electrodes. The author theorized that this occurrence, if repeatable, would tend to indicate the existence of a perception capability in plant life that, to the best of his knowledge as of that occasion, had yet to be identified.

During subsequent months, additional charts were obtained from other plant varieties as well as the one originally observed. Other

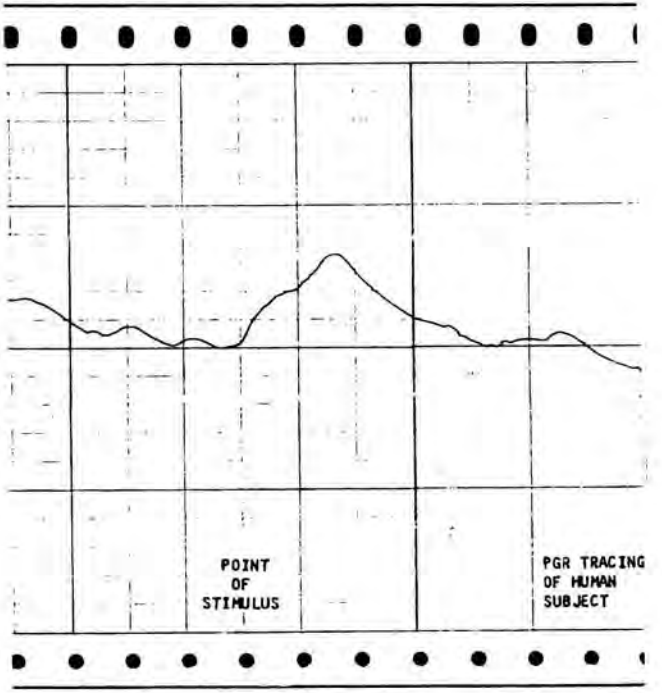

FIGURE 1

Left: Section of the February 2, 1966 plant monitoring chart which suggested to the author that the plant tracing contour resembled human tracings containing verified emotional arousals.

Right: A section of a chart exhibiting a verified emotional arousal in a human subject.

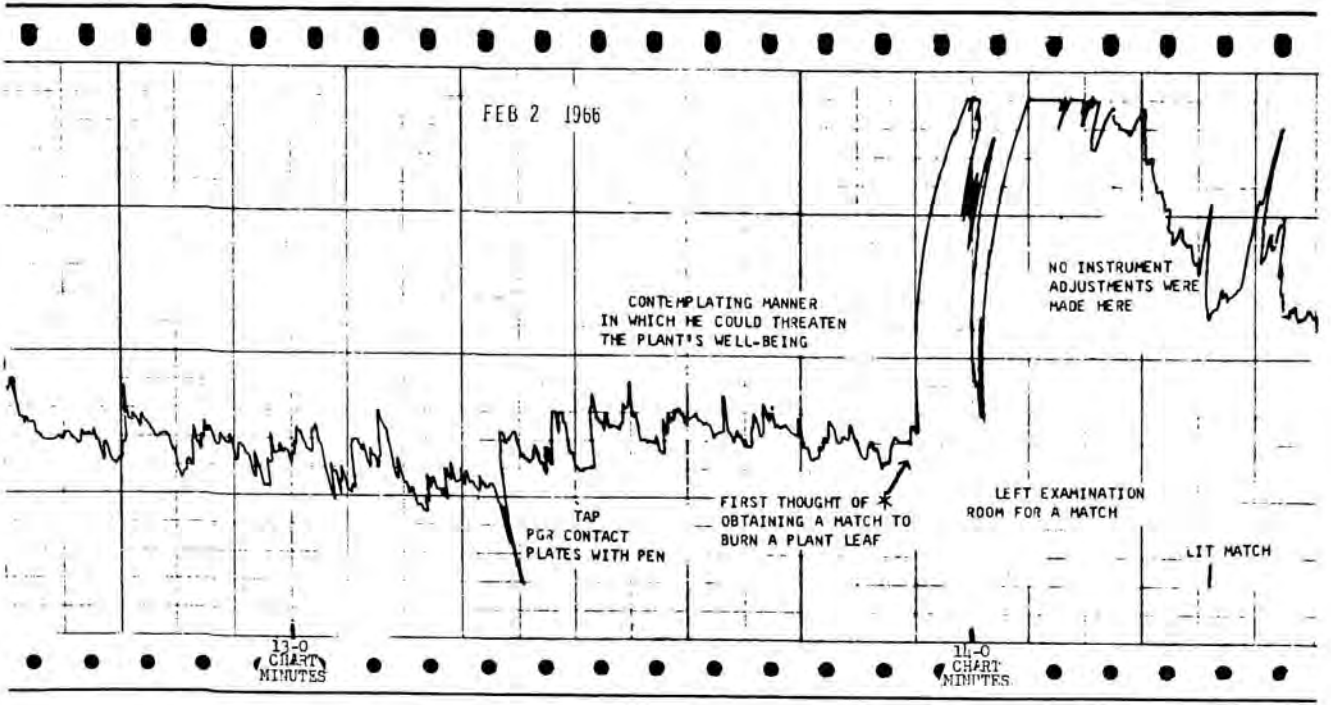

FIGURE 2

Section of the February 2, 1966 plant monitoring chart showing the reaction which occurred at the same time that the author thought of burning the plant leaf.

instrumentation was utilized and the testing location was varied. Arousal phenomena were repeatedly evident, frequently serving to reinforce the tentative theory of the existence of a yet undefined perception facility in plant life. The phenomena persisted when the plant leaf being tested was detached from the parent plant, and even when the detached leaf was trimmed to electrode size or shredded and redistributed between the electrode surfaces.

Through expansion of the plant leaf exploration into the areas of living tissue of fruit, vegetables, and several forms of animal cell life (including tissue scrapings from the human body), which he monitored with the same—or a similar type of—instrumentation, the author continued to find arousal patterns exhibited, along with frequent examples of the apparent perception capability initially observed when testing plant leaves.

In considering an effective format for investigation of the phenomena in accordance with scientific methodology, the author decided that a more consistent occurrence of the suspected perception capability under exploration might accompany the maximum threat to the well-being of somewhat remotely located cell life, i.e., its unexpected termination. Brine shrimp, of the variety used as "live food" for tropical fish, were selected as the animal life to be terminated in this experiment, their termination serving as the remotely located stimulus, and philodendron plants were selected as the plant life to be monitored in the investigation of the possible existence of a yet undefined perception capability in plant life.

The experiment design excluded human presence in the experiment environment[4] (Fig. 3) during the critical portion of the experiment[5] (Fig. 4). As a means of attempting to avoid possible complications from living organisms, other than those included within the experiment design, all experiment sessions were scheduled at a time which favored keeping such potential interference at a minimum.

HYPOTHESIS

The author proposes that there exists a yet undefined primary perception in plant life, that animal life termination can serve as a remotely located stimulus to demonstrate this perception capability, and that this perception facility in plants can be shown to function independently of human involvement.

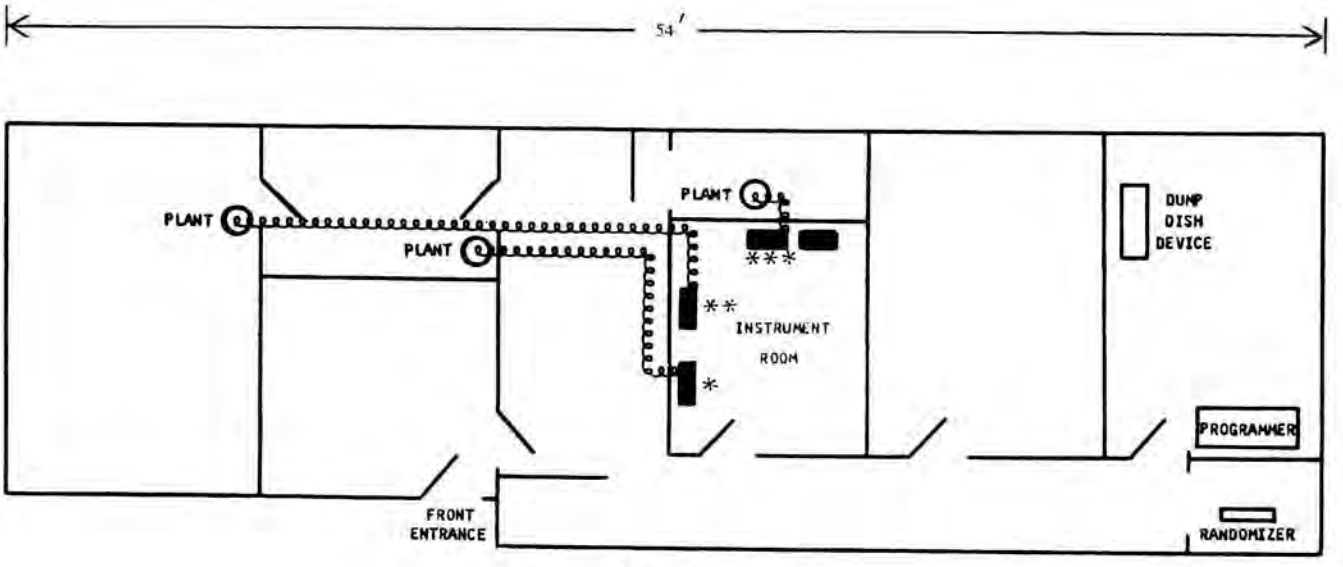

FIGURE 3

EXPERIMENT ENVIRONMENT

The randomizer selected the time when the programmer caused the dump dish device to terminate the brine shrimp. Instruments monitored plants as indicated above, by inter-connecting cables. The plants reacted when the brine shrimp were terminated.

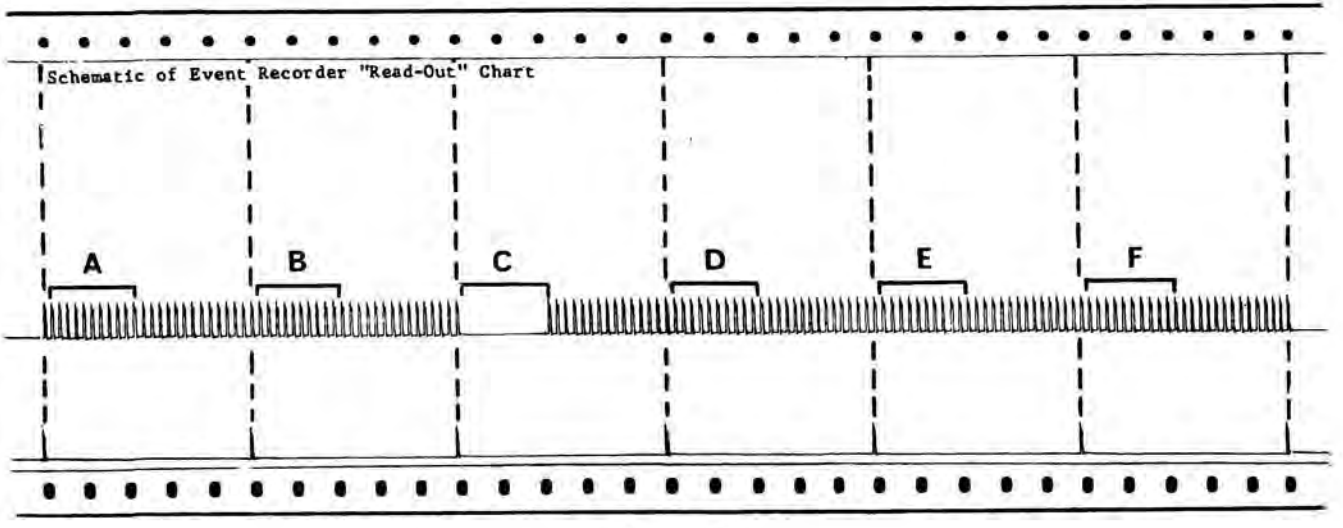

FIGURE 4

CRITICAL PORTION OF THE EXPERIMENT

The critical portion of the experiment is divided into six time blocks, a time block being a defined period in which the brine shrimp termination can occur. This stimulus occurs within the first ten seconds of the time block selected (above location C) by the randomizer. Typically, the plants react in the stimulus time block, but not in the others.

EXPERIMENT DESIGN

A. CONCEPT

This experiment involved a fully programmed method for terminating animal life on one randomly selected occasion of six possible occasions, while simultaneously and independently monitoring three remotely located plants with recording resistance bridge (wheatstone) instrumentation.

B. APPARATUS

The overall apparatus consisted of systems for plant life monitoring, animal life termination, and chart correlation. Each of the systems was designed to preclude human involvement during the critical portion of the experiment.

To perform the function of a control at the plant life monitoring system, three recording resistance bridge instruments were utilized. Each of three plants was simultaneously, but independently, monitored by one of these instruments. The reason for utilizing three plants was to provide additional data and to act as a means of detecting electromagnetic field disturbances, on the principle that such disturbances would be revealed by similar contour characteristics occurring simultaneously on all charts.

As an additional control at the plant life monitoring system, a fourth recording resistance bridge instrument used a fixed value resistor in place of plant leaf tissue.. The resistor value was 100,000 ohms, a resistance value at an overall estimated average of the resistance encountered during plant leaf monitoring. The sensitivity setting on this fourth instrument also approximated the average sensitivity settings on plant leaf monitoring instrumentation. The tracing produced by this instrument was for the purpose of displaying possible variances which might have been caused by power supply voltage fluctuation or by possible electromagnetic disturbance occurring near or within the experiment environment. The chart speed of each of the monitoring instruments was six inches (15.24 cm.) per minute. Each of the plant life monitoring instruments was equipped with a recording pen repositioning feature[6] which served the important function of keeping the tracing pattern on the chart. This feature automatically accomplished recentering of the recording pen when it reached the top or bottom of chart paper limits.

Each plant monitoring station was located in a separate room remote from the location of the animal life termination system. The lighting for all plant monitoring stations was kept uniform, as was the temperature.

The electrode assembly for monitoring each plant consisted of a 2 x 3 cm. stainless steel electrode pressed against each side of a plant leaf with a stand-mounted "C" clamp. A piece of sterile gauze, impregnated with agar-agar[7] gelatin, was inserted between each electrode and the plant leaf to cushion the contact of the metal electrodes against the plant tissue and to reduce the amount of electrical resistance which might ordinarily be encountered if the electrodes were applied directly. Each instrument operated within a resistance range up to 250,000 ohms. Adequate, but not excessive, electrode contact pressure was applied to balance a leaf within this resistance range. The bridge current was 40 micro-amperes.

The power supply for all four instruments was interruptable by a timing device which allowed for automatic discontinuance of chart recordings within three to five minutes after the last of the six possible animal life termination time blocks had occurred.

The animal life termination system consisted of a randomizer,[8] a programmer,[9] and a dump dish device.[10] The randomizer was designed to select one of six possible animal life termination time blocks. The programmer was responsible for automatically inverting the dump dish of brine water, containing the brine shrimp, at the beginning of the 25-second time block selected by the randomizer. The dump dish device also included a hot water immersion bath in which the animal life was terminated. After dispensing its brine water containing the brine shrimp, the dump dish was automatically returned to its upright position, to preclude possible contamination by a "late-fall" of a brine shrimp.

The chart correlation system contained a programmer event recorder "read-out"[11] which was totally disconnected, through an automatic cable disconnect, from each of the four instrument stimulus markers during the critical portion of the experiment. This system was designed to assist the post-experiment chart evaluation by giving adequate chart reference prior to the cable disconnect, for determination of the location of each of the six critical portion time block presentations.

To serve as a control, the animal life termination system was

utilized to execute a series of drops of brine water containing no brine shrimp. These drops were made to detect possible interaction between the mechanics of that system and the tracings of the plants being monitored.

C. PROCEDURE

A series of seven runs was decided upon for this experiment, and they were conducted within two sessions. Three plants were simultaneously, but independently, monitored during each run.

Before each session all equipment was checked for possible malfunction, and the immersion bath heater was actuated.

The plants selected for monitoring in each of the experiment runs were of the species *philodendron cordatum*. This species was selected because of the adequacy of leaf structure as related to size (larger than electrode surface area) and structure (sufficient thickness and firmness to prevent shorting out of the electrical circuit due to the electrodes penetrating the leaf tissue and touching each other).

The animal life species selected for termination during each experiment run was brine shrimp, selected for ease in pre-experiment maintenance and ease of handling during the automated experiment runs.

As a precaution against a possible plant equivalent to habituation[12] in animal life, no plant specimen was used for more than three runs.

Each of the three plant specimens scheduled for initial use during the forthcoming run was brought into the experiment environment and placed at its assigned plant monitoring station. For its initial run, a pair of electrodes were attached to the plant leaf at least fifteen minutes prior to the actuation of the programmer.

In the room containing the plant life monitoring instrumentation, each of the four instruments was actuated. Each of the three plants was balanced in, and amplifier sensitivity level adjusted on its respective instrument. Each amplifier sensitivity level[13] was adjusted to permit adequate display of tracing phenomena, but not to the degree of amplification which would create a need for excessive activation of the instrument's automatic pen-repositioning feature.

Three mature brine shrimp were selected in the pre-experiment animal life holding area. Special attention was given to the liveliness of the brine shrimp, as a precaution against subnormal physiological

functioning due to poor physical condition, or the possibility of their premature expiration due to natural causes. The brine shrimp were then brought into the experiment environment and placed in the dump dish.

A final inspection was made of the then current quality of the three plant monitoring chart tracings, checking their fluidity and the appropriate degree of phenomena magnification (amplifier sensitivity setting).

The randomizer was actuated, thereby providing selection of the time block in which the inversion of the dump dish would occur. The time block selected remained unknown to the research personnel.

The programmer time delay switch was then actuated and, for chart identification, the rubber stamp with the clock-actuated time-date data was imprinted on the then moving chart paper of the event recorder "read-out." Then, in the plant life monitoring room, the time-date stamp impression was imprinted upon each of the four moving instrument charts. Their timing device was set for automatic shut-off after a time lapse of ten minutes.

Meanwhile, the programmer executed the first pip of a series of seven chart correlation pips, ninety seconds after actuation of its time delay switch. This and the remaining six pips were made at twenty-five second intervals—all prior to the start of the critical portion of the experiment run. These seven pips appeared simultaneously on the event recorder "read-out" (in the animal life termination system) and on each of the four moving instrument charts (in the plant life monitoring system), thus providing a chart correlation reference to allow for post-experiment determination of the exact location of the stimulus. Immediately following the seventh pip, the automatic cable disconnect severed the link between the animal life termination system and the plant life monitoring system.

The critical portion of the experiment run (consisting of a sequence of six potential stimulus time blocks of twenty-five seconds each) then followed.

During the randomizer selected time block at which the stimulus occurred, the dump dish inverted, dropping the brine water containing the brine shrimp into the simmering water below, thereby causing their termination.

After the six critical time blocks, an additional time block of

twenty-five seconds duration elapsed, followed by the automatic deactivation of the programmer.

Immediately upon their return to the experiment environment, the research personnel noted the amplifier sensitivity setting on each of the four charts, along with appropriate identification of the respective monitoring instrument involved. After detaching the charts and aligning them through use of the sets of seven correlation pips, identification of the six potential stimulus time blocks that followed was facilitated through the use of a master format (event recorder "read-out" with no drop occurring).

The fixed value resistor control instrument chart was analyzed for any indication of tracing distortion. The location of any such distortion would have been noted at the corresponding location on each of the accompanying three plant monitoring instrument charts.

A different, randomly selected identification number (from 10 to 99) was marked upon each chart by the experiment referee who then attached each chart to a chart mounting card with only the critical portion of the experiment tracing exposed for subsequent blind interpretation.

This procedure was followed during both experiment sessions. To serve as a further animal life termination control, seven additional runs were made with the same plant specimens but with the stimulus "drop" consisting of sterile brine water containing no brine shrimp.

POST-PROCEDURAL EVALUATION

The code-designated charts were interspersed by the experiment referee. The charts were then independently examined (on separate occasions) by each of the three members of the chart interpretation team. Standard PGR (psychogalvanic reflex) chart interpretation methods were applied, i.e., reactions were determined on the basis of substantial tracing segment variance from tracing average (Fig. 5). The following categories of charts were disqualified according to firm interpretation rules stipulated in advance: (a) charts exhibiting gross overactivity (throughout two-thirds or more of the critical portion); (b) charts exhibiting no apparent reaction capability (throughout the entire critical portion); (c) charts exhibiting mechanical failure (failure of the recording pen recentering apparatus, failure of the chart drive system, ink stoppage in recording pen).

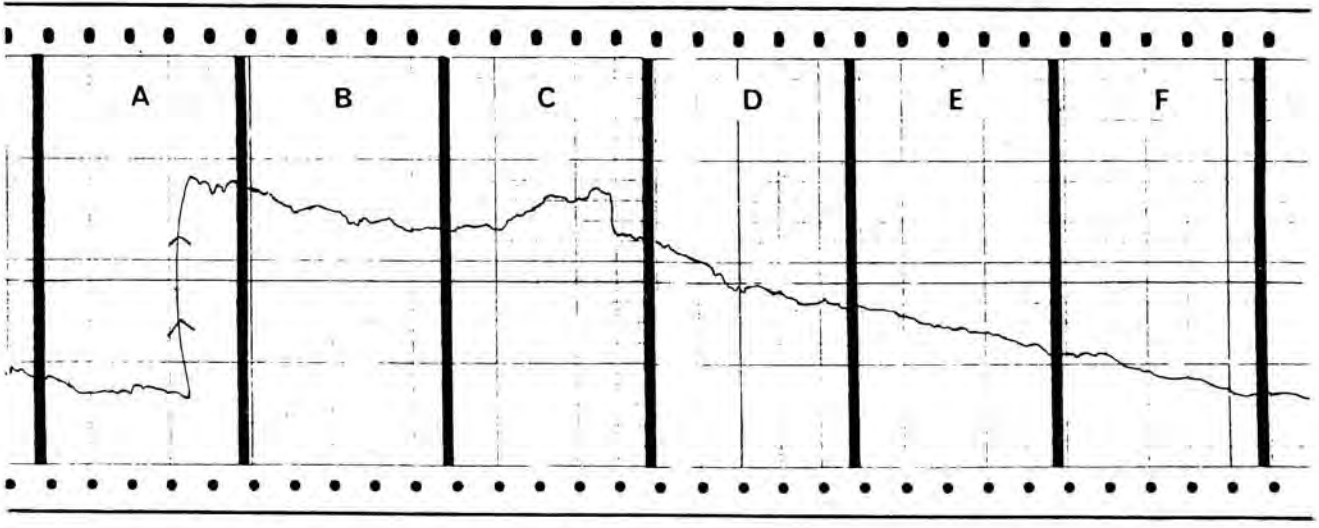

FIGURE 5

Time block C shows a plant reaction occurring subsequent to brine shrimp termination. In this example, none of the other time blocks shows an arousal. Note example in time block A of recentering performed by the automatic pen repositioning feature.

On qualified charts, determinations were made of presence of reaction or lack of reaction for each time block. Each time block was classified as a presence of reaction bit (+) or as a lack of reaction bit (−).*

Each chart was interpreted without knowledge of the run from which the chart was derived, without reference to the corresponding event recorder "read-out," and without reference to either of the other two accompanying charts resulting from the same run. Differences in interpretation (two out of seventy-eight bits) were resolved by mutual agreement of the three members of the chart interpretation team.

The experiment referee later identified each of the plant life monitoring charts with its actual run. Determinations of reactions were then compared for coincidence with the actual stimulus time block of the run, as indicated by the event recorder "read-out." At this time, inspection was made for simultaneous chart contour similarities throughout, with particular emphasis on the occasion of the stimulus time block.

The same procedure was followed in interpreting the results of the sterile brine water control runs.

RESULTS

The animal life termination portion of the experiment comprised two sessions, involving a total of seven runs.

None of the seven fixed value resistor control charts indicated other than an uninterrupted straight line tracing. No two plant life monitoring charts in a given run indicated simultaneous similar tracing contours. This provided evidence of the absence of significant power supply voltage fluctuation and the absence of significant electromagnetic spectrum interference.

As three plants were simultaneously, but independently, monitored during each run, the seven runs produced a total of twenty-one charts. Two charts were disqualified for mechanical failure of the automatic pen repositioning feature; three charts were disqualified for displaying gross overactivity, resulting in extensive tracing dis-

* One twenty-five second time block constitutes a "bit."

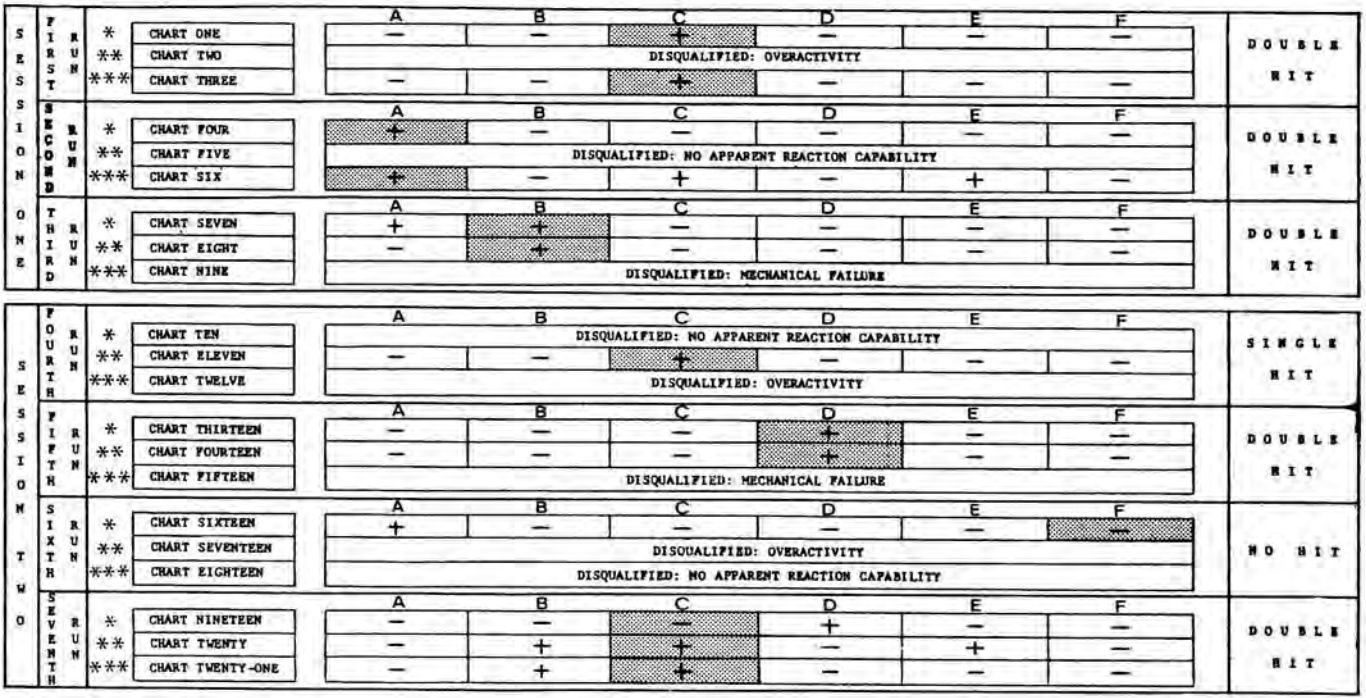

FIGURE 6

EXPERIMENT DATA

The experiment comprised three runs in Session One and four runs in Session Two. The symbols *, **, and *** represent the three plant monitoring instruments and their respective plant monitoring stations. The letters A, B, C, D, E, and F represent the six potential time blocks. For each qualifying chart the actual stimulus time block is signified by the shaded area. A minus sign indicates no reaction in a time block. A plus sign indicates a reaction in a time block. There is special significance in double hits (i.e., when a reaction is

tortion; and three charts were disqualified for not displaying typical fluidity and, therefore, no apparent reaction capability throughout the entire run. Thus, eight charts were disqualified per rules firmly established in advance of all experiment runs, leaving thirteen qualifying charts.

As six time blocks comprised the critical portion of the experiment, there was a total of seventy-eight information bits on the thirteen qualifying charts.

Of the thirteen stimulus time blocks, eleven contained tracing reactions (hits). These time blocks were classified as presence of reaction bits (+). Two of the thirteen stimulus time blocks did not contain tracing reactions (misses). These time blocks were classified as lack of reaction bits (−).

Out of sixty-five time block possibilities for non-related tracing reactions (in non-stimulus time blocks), eight contained such reactions and were classified as presence of reaction bits (+). The remaining fifty-seven non-stimulus time blocks contained no reactions and were classified as lack of reaction bits (−).

Five of the runs contained double hits, i.e., a reaction in the stimulus time block within two of the three charts from the same run (Fig. 6), accounting for ten of the eleven hits.

Chance expectation would provide five non-related tracing reactions to each hit, a ratio of five to one. As the experimental results comprised eight non-related tracing reactions to eleven hits, a ratio of less than one to one, the results significantly exceed chance expectation.

In the sterile brine water control runs there was no indication of interaction between the overall animal life termination system mechanics and the tracings of the plants being monitored.

CONCLUSIONS

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.

DISCUSSION

Because of the requirements of scientific methodology, the scope of the experiment described in this report is of necessity limited, but the implications stemming from the results are abundant.

The experiment results show that recording resistance bridge (wheatstone) instrumentation can be utilized to monitor plant life phenomena, demonstrating a similarity to that which has been called "extrasensory" perception when related to animal life. This experiment should be readily replicable, providing the experiment design is followed precisely.

Based upon Backster Research Foundation observations during a period of approximately three years, and on research currently in progress, the author hypothesizes that this perception facility may be part of a primary sensory system capable of functioning at cell level. This is further suggested by observation of its apparent presence in plant and animal tissue separated from an organism (including human), and maintained *in vitro* where the specialized senses are not present.

The overall implications derived from explorations to date seem important, but they also reveal the present inadequacy of answers relating to the basic nature of this phenomenon, its fundamental characteristics, its geographical limits, its mode of transmission, its susceptibility to shielding, its influence on matter, its information retention capabilities, its stimuli discrimination capabilities, etc.

Indication of the existence in plant life of an equivalent, not only to habituation, but also to conditioning capability (as applied to animal life), seems of great importance, and suggests areas of potentially productive research in the fields of pathology, horticulture, entomology, ecology, etc.

Research approaches now seem practical in areas which have been elusive in the past regarding compliance with the strict standards required by scientific methodology. Opportunities could well exist for productive investigation of diverse psychological phenomena, including the study of group interaction and the possibility of allowing deeper insight into cellular "blueprints," as related to individual cell functions within the developing organism. New dimensions may be found in genetics and in life-matter interrelationship. On the basis of preliminary exploration, the author considers productive research

possible in all of these, as well as other areas. It should be noted, however, that such implied potential must be termed speculative until each aspect has been individually and thoroughly subjected to scientific examination.

NOTES

1. In this frame of reference, "a primary perception" refers to the presence of a yet undefined perception phenomenon in all cell life (plant and animal), regardless of the assigned cell function.
2. The author is a specialist in applications of the psychogalvanic reflex (PGR), also known as the galvanic skin response (GSR), in a variety of behavioral studies. The instrumentation utilized in these studies monitored resistance variance by use of wheatstone resistance bridge circuitry, amplified these changes, and then displayed them by means of ink-recording galvanometer "read-out."
3. Rather than showing a decrease in the plant leaf's electrical resistance, the initial portion of the February 2, 1966 tracing displayed continuously increasing resistance. The instrumentation indicated the increasing resistance as a downward trend of the ink tracing.
4. The experiment environment comprises the inter-connecting rooms in which the experiment was conducted. Within this immediately accessible and frequently used area, each plant then being monitored, plant monitoring instrumentation, and the animal life termination system were located in different rooms.
5. The critical portion of the experiment contains the six consecutive "potential stimulus" (animal life termination) time blocks of twenty-five seconds each. Two other twenty-five second "no stimulus" time blocks, one immediately preceding and one immediately following the group of six "potential stimulus" time blocks, are also included to facilitate chart interpretation.
6. The photo-electric cell actuated ink recording pen repositioning feature automatically recenters the recording pen when it reaches the top or bottom limit of the chart paper. This was accomplished by a system of electric relays and a ten r.p.m. "Bodine" reversible motor, inter-connected by a slip clutch linkage to the amplifier "position-on-chart" potentiometer shaft. A small mirror attached directly above the pivot point of the recording pen (in a vertical plane), reflected a beam of light to the appropriately located photo-electric cells, including a third photo-electric cell to turn the repositioning motor off when the pen accomplished its return to the approximate center of the chart paper.
7. Agar-agar is a seaweed by-product which forms a gel when mixed with water and heated. In this experiment 3 grams of agar-agar powder were added to 240 milliliters of distilled water, to which 3.5 grams of table salt were added. While continuously stirring, the mixture was then brought to a boiling point. Sterile gauze of one-inch width was immersed in the heated mixture. While still in a liquid state, excess agar-agar (that exceeding the thickness of the gauze) was removed from the gauze. The mixture impregnating the gauze was allowed to become a gel, was cut into convenient electrode-size pieces, and then submerged in room temperature sterile water for storage. Before application between an electrode and a plant leaf, excessive moisture must be blotted from a gauze strip, as such moisture will impregnate the leaf tissue and shunt the resistance bridge current via

the water rather than the plant leaf cell structure, thereby resulting in little or no tracing detail.

8. The randomizer included a twelve contact rotary step switch designed through cross-wiring to partially complete any one of six (potential stimulus time block) electrical circuits. A wheel with a permanent magnet at its center was rotated. Each half-turn energized a reed switch, which in turn advanced the solenoid actuated step switch one position. The ultimate circuit choice, which could not be observed, determined the time block in which the stimulus would occur. The stimulus time block circuitry was then completed by subsequent programmer action.
9. The programmer executed the stimulus (brine shrimp termination) when it arrived at the beginning of the randomizer selected time block. A switch, activated by the appropriate programmer cam, electrically energized the dump dish motor. The programmer had a one and a half minute "time delay" switch which was manually actuated. The actual programmed cycle of events automatically started after that period of delay. The programmer was automatically deactivated at the end of its cycle.
10. The dump dish device consisted of a dish of 8.5 ml. capacity, limited to 180° rotation (inversion) by means of a six volt reversible DC electric motor. The dump dish was located approximately 13 cm. above the surface of the simmering water in the immersion bath. Following an approximately ten-second inversion period, the motor was reversed, returning the dump dish to its upright position, thereby preventing possible latent droppage of part of its contents. A mercury switch attached to the motor shaft interrupted the pulsating visual display on the event recorder "read-out" chart when the shaft rotated to invert the dump dish. The interrupted pulse designated the location of the programmed stimulus. The pyrex dish immersion bath contained approximately 1500 ml. of fresh water (approximately 6 cm. deep) heated by a 250 watt thermostat-controlled immersion heater. An underwater rotary agitator, shaft connected to an overhead synchronous motor, also helped to maintain temperature uniformity. A thermometer, suspended from an overhead support, provided temperature data which was noted just prior to the programmer actuation. A motor driven fan was located approximately 10 cm. above the water surface, with air-flow direction passing immediately below the dump dish. This served to prevent preheating of the dump dish contents. During the experiment runs, the temperature of the immersion bath water was maintained within a range of +52 to +64 degrees Centigrade.
11. The event recorder "read-out" produced a chart designed to correlate the actual stimulus time block location with its corresponding location on each of the four instrument charts. It utilized a chart drive unit of the same speed as those on the four monitoring instruments. The visual display on the event recorder "read-out" chart was pulsed at a synchronous motor-controlled rate of one pulse per second. This served to prevent damage to the solenoids used for the marker mechanisms, offered a vivid visual display, and the rate provided one-second interval time constant subdivisions. The event recorder "read-out" interconnecting cable was terminated at a point between the instrument area and the animal life termination area. This interconnecting cable's spring loaded "disconnect," located just outside of the instrument area entrance, allowed for a twelve-inch section of the cable to be released by solenoid action. This occurred at the very outset of the critical portion of the experiment and automatically interrupted interconnection between the programmer area and the instrument recording area.
12. On the basis of preliminary data gained from other, but related, research in progress at the Backster Research Foundation, habituation may well be

a factor which should be taken into consideration. As a precaution, prior to their use in the experiment, the newly procured plants were kept in a pre-experiment plant holding area at a distance of approximately 90 feet from the experiment environment. An equivalent precaution was exercised with the brine shrimp which were kept in a pre-experiment animal life holding area at a distance of approximately 45 feet from the experiment environment. The two holding areas were approximately 120 feet from each other.

13. The average sensitivity setting on the three plant monitoring instrument amplifiers was 27.3 units of a 100 unit total range. The fourth monitoring instrument (control) was balanced in on a 100,000 ohms fixed value resistor, and its amplifier sensitivity level was set at 30 units.

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