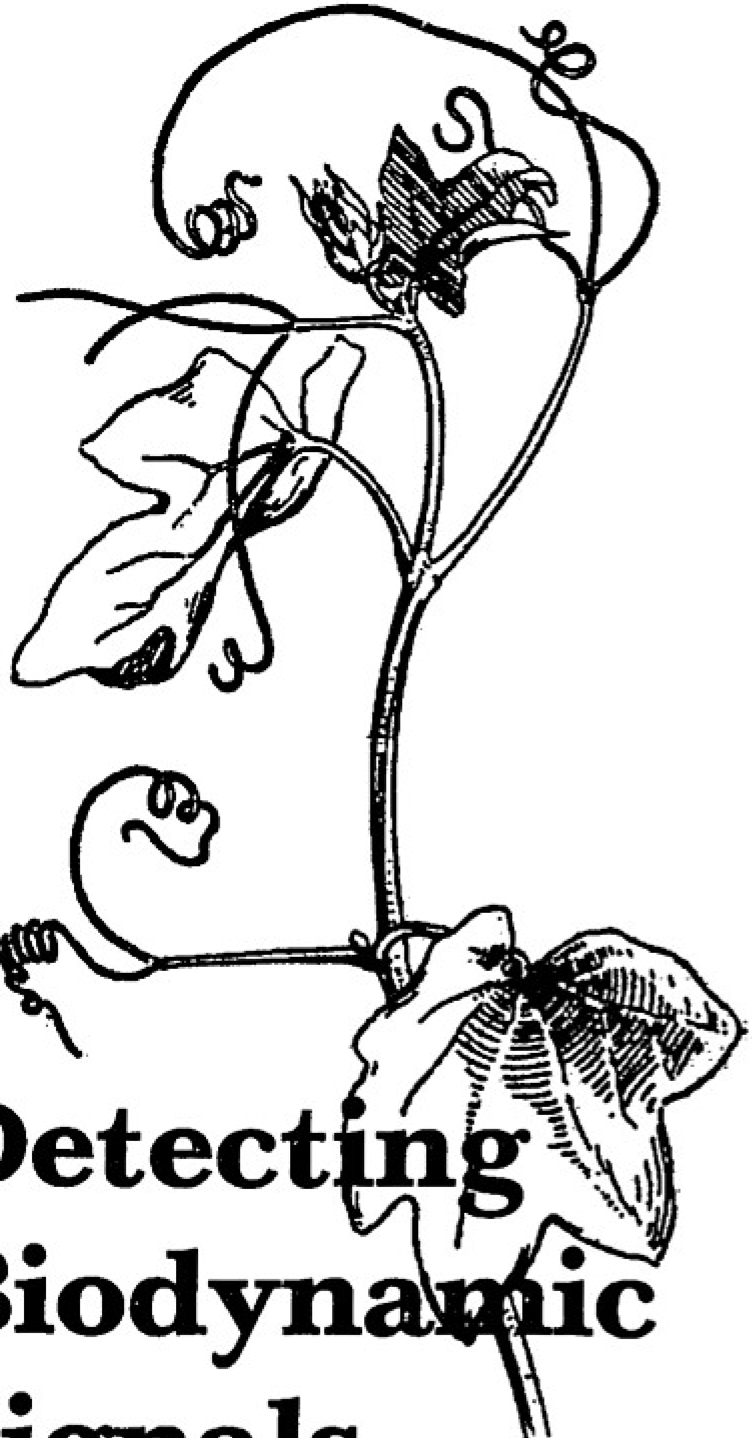


# Detecting Biodynamic Signals

## Part I

by Michael Theroux

THE means to detect communications and energies which exist outside of the electromagnetic spectrum has been an enduring question of qualitative researchers for many years. The catalogue of these pursuits is indeed a long one and can by no means be completed here, but we will attempt to cover historically those researches which warrant our attentions, based on the value of the attained results. We will also include research currently being done by BSRF and others.

Much evidence indicates that specific communications and energies DO exist outside the conventional electromagnetic spectrum of which our finest examples may be found in the sciences of radionics, homeopathy, dowsing, radiesthesia, and etheric engineering to name a few. We will use the all encompassing term "vital force" where it is necessary to reference these energies which have been given many names over the course of the historical experiment. That the vital force is biodynamic in character cannot be disputed, and will be designated as such whenever describing these "signals". While conventional modes of discovering these "biodynamic" signals has in the past relied on the human subject as an integral component of detection, i.e. the use of the stick plate, pendulum, l-rod, etc., we are concerned here with what has been referred to as the "automatic detecting instrument" - sans human subject.

There is already a great wealth of information on such instruments, much of which has been compiled in the book, Automated Detecting Devices, by Jorge Resines. Those wishing for a more extensive bibliography should consult Mr. Resines' publication. For our current purposes, it is necessary to confine ourselves only to those instruments which we ourselves have experimentally verified, and these will be the methods detailed here. Our investigations into the detection of biodynamic signals begins with the outstanding work of L. George Lawrence.

L. George Lawrence, a Silesian-born electronics specialist, began his studies into plant biodynamics in 1962 while employed as a instrumentation engineer for a Los Angeles space-science corporation. He was actually engaged in a project to develop jam-proof missile components, and believed that using plant tissue as a type of transducer would produce the desired results. He summarized that living plant tissues or leaves were capable of simultaneously sensing temperature change, gravitational variation, electromagnetic fields, and a host of other environmental effects — an ability no known mechanical sensor possessed. These initial investigations led him to the works of Alexander Gurwitsch, a Russian histologist, whose experiments in the 1920s proved that all living cells produce invisible radiations of a biodynamic character. While observing the cells of onion roots, Gurwitsch noticed that they began dividing with a distinct rhythm causing him to trust that some type of vital force from nearby cells was the cause. To verify this hypothesis Gurwitsch devised a type of ray gun which entailed mounting an onion root tip inside of a thin glass cylinder which was then aimed at a matching arrangement with a small area of onion root exposed to act as a target. Gurwitsch allowed the onion "ray gun" to bombard the sample for three hours, at which time he examined the target specimen under his microscope. The number of cell divisions in the irradiated area had increased by 25 percent! Gurwitsch tried to block the emanations with a thin slice of quartz crystal, but this proved ineffective. Only glass or a gelatin substance guaranteed blocking the transmissions. Owing to the fact that these rays from the onion "ray gun" demonstrated increased cell division or mitosis in the target, Gurwitsch called them "mitogenetic rays." Many other laboratories would confirm his findings. Researchers in Paris, Moscow, Berlin, and Frankfort all corroborated Gurwitsch's results. Only the U.S. Academy of Sciences reported that Gurwitsch's discovery was not replicable, and suggested it was merely his fertile imagination.

This system of being able to manage and direct the vital force in living plant tissue sparked Lawrence into action. Equipped with the [49]knowledge of Cleve Backster's recent experiments with plants and a polygraph instrument, Lawrence began building several psycho-galvanic analyzers to detect responses in plants. He quickly corroborated the results that Backster had obtained from his plant experiments — these results indicating that plants displayed a unique cellular consciousness. Over the course of his experiments, Lawrence would begin to modify the basic recording apparatus from the simple galvanic skin response indicators, to ultra-high-gain piezo-electrometers. He also did away with the pen recorder, opting for a built-in audio oscillator which produces a steady tone, changing to distinct pulsations when the plant sensor is activated by external stimulation. Aural monitoring has many advantages over the pen recorder, chief of which is the relative ease with which one can oversee (hear) the plant's response. Another feature Lawrence would bring to the field was the replacement of the test plant with biologically active sensors, or "biodynamic transducers". These could range from simple tubes containing vegetal material in a temperature controlled bath, to thin AT-cut quartz crystal wafers bonded with specific organic materials housed in a Faraday chamber. In the latter device, the highly reactive organic material induces changes in the crystal, which when used in an oscillator circuit, will alter the oscillator's frequency.

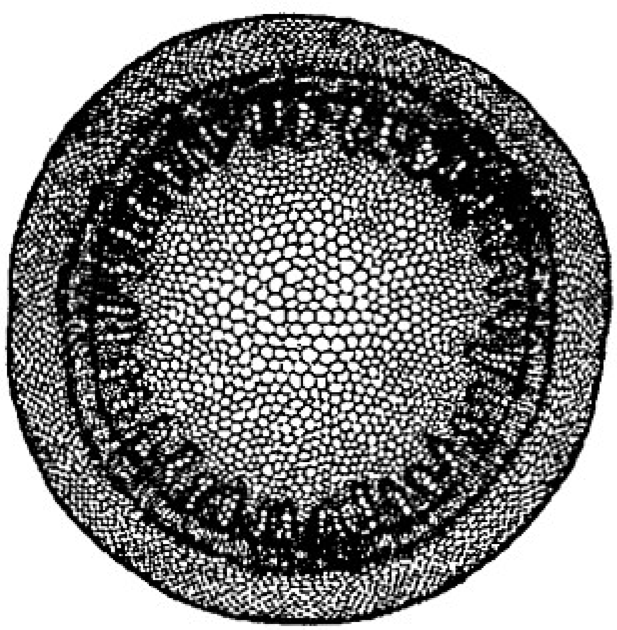
Lawrence preferred to perform his experiments in what he called "electromagnetic 'deep fringe' areas", where there were no man-made interferences. The remote locations of the high desert in southern California were his favored haunts for these investigations. In October of 1971, Lawrence was working on an experiment near Temecula, California. He had developed an instrument which would receive a directional biodynamic signal from a distance of up to one mile away. This instrument consisted of a lensless tube which housed a cylindrical Faraday chamber. The base of this tube contained a biodynamic transducer which was connected to the recording instrumentation. The complete "biosensor" tube was mounted on top of a low power telescope for directional sighting. To induce a stimulus into the directional biosensor, Lawrence would train the sights of his instrument on a plant or tree some distance away that had been previously wired with electrodes. These electrodes were connected to a switch which when closed would introduce a pre-measured current into the tree or plant. Back at the test site, Lawrence would then gently electrocute the tree or plant by radio control, causing his biosensor apparatus to respond wildly. This was an exciting new breakthrough in the field of detecting biodynamic signals for the instruments were now directional and worked at a considerable distance. But, this is certainly not the end of the story. On the day of these experiments, Lawrence and his assistant decided to take a late afternoon break. The biosensing instrument had been left on and was pointing in a random direction at the sky. As they began to eat their lunch, the steady sounds from the equipment abruptly changed to the familiar series of pulsations instantly signaling that it was picking up some sort of disturbance. After checking the apparatus and finding no malfunctions, Lawrence determined that the signals had to be coming from outer space! These seemingly intelligent gestures from an advanced civilisation would most probably be transmissions of a biological nature, and not from the electromagnetic spectrum which had so consumed the academicians of previous SETI projects. This discovery would remain the primary focus of all of Lawrence's later experiments with biosensing instruments.

Lawrence had initially determined, based on the direction the instrument was pointing, that these signals originated from the constellation Ursa Major, commonly known as the Big Dipper. Later, after repeating the experiment several times with more elaborate equipment, he speculated that galactic drift may have been involved and that the signals may have been "spilling over" from the galactic equator which hosts a very dense star population. He believed the signals were not directed at earthlings, but were probably transmissions between companion civilizations, which he felt would communicate via "eidetic imagery". This led him to begin analyzing these signals with video recording equipment. The images produced by these signals were called "biograms" and were basically digital spectrograms with a gray-scale resolution of 640 x 482 x 8 bits. Interpretation of these biograms needs considerable study. Unfortunately, there has been little information on this aspect of Lawrence's work, and it seems as though this was to be the last installment of his labors.

The information we have retrieved on L. George Lawrence's achievements is scant at best. Much of it comes from the few articles he wrote, and the brief generalizations from the writers of more popularized books. The whereabouts of his equipment and/or notebooks is not known at this time. An important document for the re-creation of Lawrence's experiments is the movie version of "The Secret Life of Plants". In this video Lawrence is shown at work with his biosensing equipment, and one can hear recordings of the reception of biodynamic signals. One credible resource states that Lawrence was an expert oceanographer, historian, cartographer, and originator of the world's first laser engine. He is credited with the authorship of some 46 books, but we have recently discovered that the name "L. George Lawrence" was a pseudonym he used for his popular works, and only two books bearing that name are to be found. As the managing director of the Ecola Institute in the 1970s, he was engaged in nuclear radiation research, medical and agricultural biomagnetic research, and conceptive space research for NASA among other agencies. It is quite probable that much of the work that Ecola was pursuing was of a confidential or classified nature.

Over the last year, it has been a project of ours at BSRF to recreate and elaborate on the many innovations brought to our attention by L. George Lawrence. We began with the basics using simple psycho-galvanic instruments to analyze plant responses, and in the process, were able to recreate several of the results obtained by pioneers in plant research. Many of these recreations and new discoveries have been chronicled in the column, "The Borderland Experimenter" and elsewhere in the journal. The impetus which directed our experiments toward those of Lawrence was the fact that he was able to obtain directional and "wireless" biodynamic signals over great distances.

The primary setup consists of a Faraday tube with an organic "biosensor" housed at its base. A rotating beam splitter at the end of the tube further cancels out interference from stray electromagnetic[50]radiations. The most significant problem concerning this portion of the equipment is determining what will be the most suitable material for the biosensor itself. Originally, sections of plant leaves were used which had the electrodes clamped to them in the traditional manner. This proves to be a cumbersome procedure, and the plant material clamped as such quickly becomes stressed and ceases to respond at all. Hundreds of different "non-plant" substances have been tested in biosensor designs, most of which have failed in their capacity to produce the dynamic response of living materials. Unfortunately, Lawrence left few clues as to what would be the optimum arrangement here. We know that in his early work, Lawrence used a variety of mustard seeds floating in a nutrient bath for the reception of biodynamic signals. In later years, he would speak of using thin sections of plant stems or roots as a biodynamic transducer. Our finest results were obtained using this arrangement.



*A cross-section of a plant stem used as a biodynamic transducer*

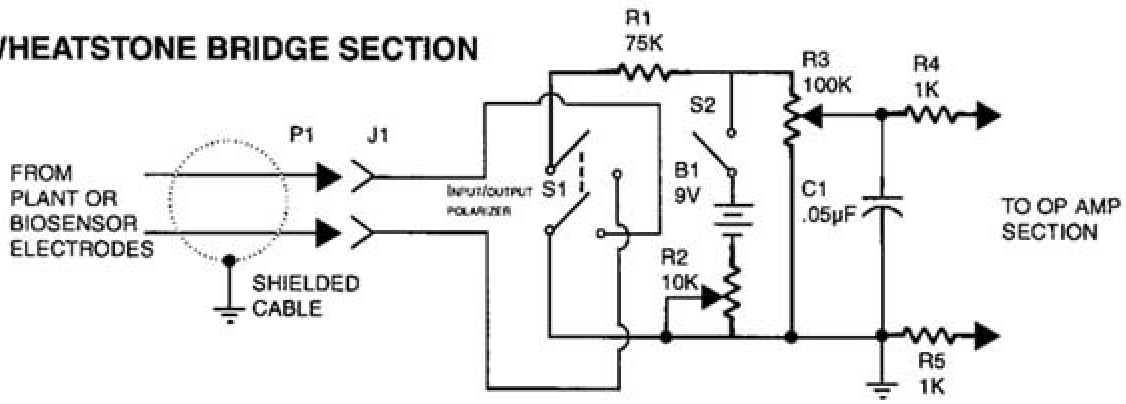
Next, the output of the biodynamic transducer is connected to the electronics package which can consist of a simple psycho-galvanic response indicator, to a more sophisticated adaptation which is shown in the schematic here. One can see this system described in many of Lawrence's articles and in use on the aforementioned video documentation. The advantage of this system over the simple biomonitor is that it affords greater selectivity with regard to sensitivity when monitoring signals. The drawback is that since these more sensitive units are not a production item, one must be somewhat skilled at building electronic instrumentation. Unfortunately, there is not enough room here to give step by step instructions on the construction of such a project from a schematic diagram for those with little knowledge in electronics manufacture. The basic details of the circuit's operation will be covered here, but some understanding of schematics and components is assumed.

The instrument designed by Lawrence has both a visual meter and an acoustical output indicator through a speaker. The audio tone output can also be directly connected to a tape recorder. A simple modification will allow one to connect the d.c. output to a pen recorder to make a permananet record of the retrieved signals. The connections to the biosensor or plant material may be done any number of ways already discussed.

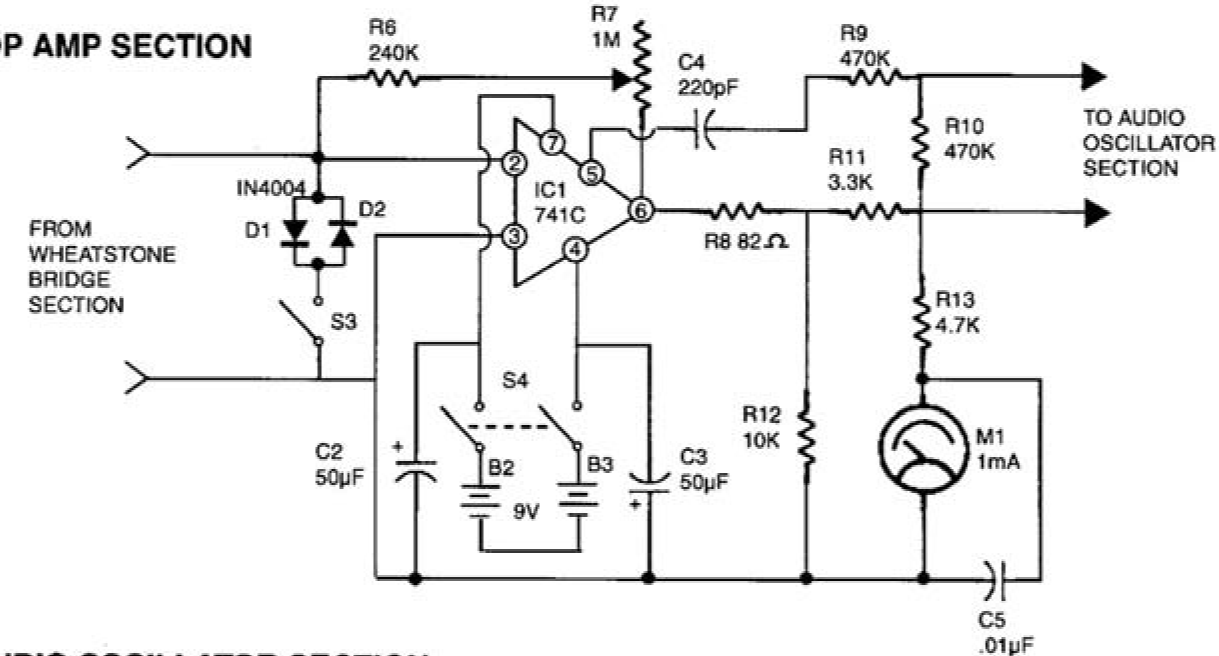
[51]

# PLANT RESPONSE DETECTOR BASED ON A DESIGN BY L. GEORGE LAWRENCE

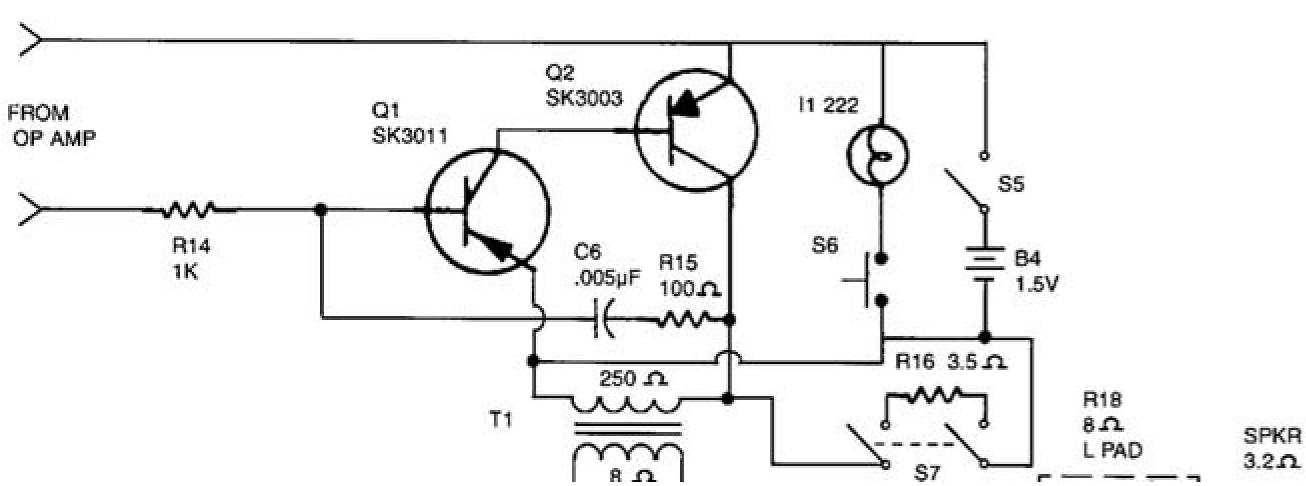
## WHEATSTONE BRIDGE SECTION




## OP AMP SECTION




## AUDIO OSCILLATOR SECTION



# PARTS LIST FOR PLANT RESPONSE DETECTOR

***RESISTORS***

- R1 - 75k
- R2 - 10k Linear Potentiometer
- R3 - 100k Linear Potentiometer
- R4, R5, R14 - 1k
- R6 - 240k
- R7 - 1M Linear Potentiometer
- R8 - 82 ohm
- R9, R10 - 470k
- R11 - 3.3k
- R12 - 10k
- R13 - 4.7k
- R15 - 100 ohm
- R16 3.5 ohm 1 watt
- R17 - 10 ohm
- R18 - 8 ohm potentiometer (L-pad)
- (all resistors ½watt unless specified)

***CAPACITORS***

- C1 - .05µF
- C2, C3 - 50µF 10 volt electrolytic
- C4 - 220 pF
- C5 - .01µF
- C6 - .005µF

***TRANSISTORS***

- Q1 - SK3011 transistor
- Q2 - SK3003 transistor

***OTHER***

- IC1 - µA741C op amp (Radio Shack 276-007)
- D1, D2 - IN4004 Silicon Diode
- B1, B2, B3 - 9v battery (with holders & clips)
- B4 - 1.5v D-cell (with holder)
- M1 - 0-1mA meter
- P1 - RCA (male) plug
- J1, J2 - gold fem. RCA jack
- T1 - Audio transformer 250/8 ohm, 200mW
- Spkr - 3.2 ohm
- I1 - 2.2v lamp #222
- S1, S4, S7 - dpdt switch
- S2, S3, S5 - spst switch
- S6 - Normally open pushbutton switch

- 3 feet of shielded two-conductor wire
- project case
- 8-pin IC socket
- perf board or eched circuit boards
- knobs for potentiometers

[52]

## Biodynamic Response Detector-Circuit Theory

Referring to the schematic, we will begin with the Wheatstone bridge section. The biosensor connected to input J1 forms part of a Wheatstone bridge with the other legs formed by R1 and R3. Power to the bridge is furnished by B1, which is controlled by R2. Switch S1 is an input/output polarizer which permits reversal of the current or excitation applied to the biosensor. This is most important, as the setting of S1 will determine whether the plant's own generated currents will be superimposed upon the excitation currents.

The signal from the bridge is then amplified in IC1, which is protected from large signals by diodes D1 and D2 when switch S3 is closed. After the circuit is completely operational, S3 may be opened for maximum sensitivity. Power to the amp is given by B2 and B3 operated by switch S4. The output of the amplifier is indicated on meter M1, which is null adjusted by R3.

The amplified output also drives an audio oscillator (Q1 & Q2) whose fluctuation of frequency is a function of the signal from the biosensor/bridge arrangement. Indicator lamp I1 lights up when activated by the momentary pushbutton switch S6, and allows testing of battery function as well as the cueing of a mark on the tape being recorded due to the pitch increase as S6 is depressed. Transformer T1 supplies an audio output for the tape recorder, S7 turns the speaker on and off, and R18 adjusts the volume of the speaker.

After the successful construction of the instrument, one is ready to perform experiments. S3 should begin in the closed position to prevent excessive input signal going to IC1. Next, S1 should be turned on to apply current to the biosensor/bridge, which is adjusted by R2. S4 should be turned on next, followed by the adjustment of R3 for a meter null (zero setting). This will have to be readjusted occasionally as the biosensor or plant settles into its baseline (relaxed) condition. Indications of biosensor response will be observed on the meter, and in the fluctuations of the audio tone coming from the speaker. The actual amount of excitation controlled by R2, and the state of the superimposition of plant currents must be determined by actual usage. Performing these experiments in an area of low electromagnetic interference is ideal, but is not necessary unless one needs to control any outside influences. Armed with this instrument, one should be able to conduct a wide variety of unique experiments.

This concludes Part I of this article. Part II will detail advancements concerning these experiments, the introduction of "biograms", and other instruments designed specifically for the detection and analysis of biodynamic signals.

**Continue with "Detecting Biodynamic Signals" (Part II)**

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