

21 Devices for Monitoring Nonphysical Energies

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SUMMARY

Significant advances in the psychoenergetics field will be delayed until devices and techniques are developed for monitoring nonphysical energies. One general category of useful devices is that of a conventional electromagnetic nature that responds to such energies via interaction with an intermediary living transducer—human, animal, or plant. This paper is largely devoted to a discussion of two such devices: a high-voltage (Kirlian) photography device and an acupuncture-point monitoring device. The final portion of the paper deals with an expanded model of substance that seems sufficient to circumscribe known psychoenergetic phenomena so that one can gain some idea of how nonphysical energies may give rise to physical effects.

INTRODUCTION

The flux of worldwide investigation and activity in the area of psychoenergetic fields and phenomena has been such that mankind has now exceeded the "critical-mass" condition for a self-sustaining reaction. We can therefore anticipate a continued growth of awareness and perception about this domain of nature. Such an activity does not deny the validity of our present knowledge of the universe, nor does it pose a threat to what I shall call conventional physics. Rather, it calls for an extension, or expansion, of present laws to reliably model behavior in the expanded domain of variable space that circumscribes psychoenergetic fields (since we presently have some small ability to monitor this aspect of nature). Here, one should reflect on the example of Newton and Einstein. Newton's work on gravitation was not shown to be wrong by Einstein but merely limited to a domain of variable space in nature far removed from speeds approaching

the velocity of light. The laws of Einstein reproduce the laws of Newton in the appropriate limit of small velocities.

In the decades and centuries ahead, we would hope to follow and extend Einstein's example and develop quantitative laws that reliably model nature in the psychoenergetic domain and that reduce, in the appropriate limit, to our present physical laws of nature. To reach this goal, we shall need a supply of devices that can respond directly to such new energies.

We may liken conventional scientific understanding of the universe to the visible tip of an iceberg. We have come to know that exposed tip fairly well. However, most of nature is still hidden from us, and we know it not. History contains references and speculation on many aspects of the hidden iceberg, and very recent research, especially that fine work being carried out in the Soviet Union, suggests some fascinating characteristics. Let us touch briefly on some of these.

From experiments on telepathy, PK, psychic healers, and the like (18), we seem to be dealing with energy fields completely different from those known to us via conventional science.

The universe organizes and radiates information in other dimensions than the physical frame. From experiments on PK (18), radionics (24), materialization-dematerialization (19), and the like, the cause-effect relationships seem to follow a different path, or "field line," than we are used to dealing with in the conventional space-time frame of reference.

At some level of the universe, we are all interconnected. This can be deduced from the Soviet telepathy experiments on rabbits (18) and the Backster experiments on plants, eggs, and cells (4).

Time and space are not as immutable and confining as we ordinarily think. Experiments on precognition (22), materialization and dematerialization (19), and the like point to this.

From Slater's experiments (20) on the "upside-down glasses" and modern information theory (7), it seems clear that we do not perceive reality directly but only gain some bits of information about reality from our sensory system, which the brain then interprets in terms of what is in its memory picture book. The brain often does signal processing to squeeze the available information into the closest facsimile in the picture-book records (and usually causes considerable distortion in the process).

A wide range of exotic nonphysical functioning devices have been investigated over the course of this century. These devices include radionics (11), homeopathy (11), dowsing (18), Cayce appliances (25), Eemans's relaxation circuit (10), and many others. However, work on these exotic devices is limited by our inability to monitor nonphysical energies reliably.

By nonphysical energies, the author means (a) energies of a nonelec-

tromagnetic, nonsonic, or nongravitational variety as we know them, (b) energies that do not directly stimulate our five physical senses as we know them, and (c) energies that do not propagate in the four-dimensional space-time continuum as we know it. An expanded model of substance dealing with nonphysical energies will be presented later. I feel that the devices just enumerated fall into this category.

In general, there seem to be three types of monitoring devices: (a) a completely human device such as a clairvoyant who "sees" with extended vision and gives a verbal readout of observations, (b) an electronic or mechanical device connected to a living system that responds to the energy via its effect on an intermediary transducer, human, animal, or plant, and (c) a totally inanimate device based on a unique logic system (different from that associated with the physical aspect of reality) that responds to these energies directly. The first type of device is in daily use by some investigators. Some devices of the second type exist, but they suffer from the variability of the intermediate living transducer. With respect to the third category, no direct readout devices, except perhaps the Sergeyev detector (23), exist at present.

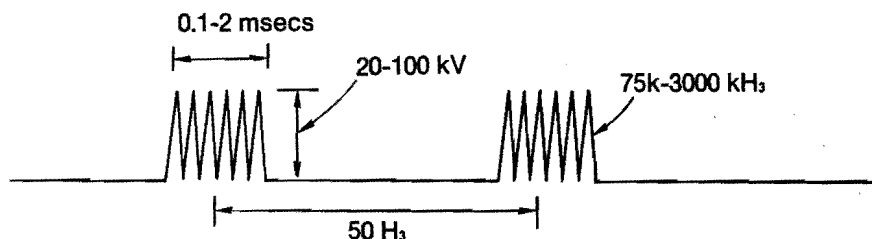
Significant advance of this field will be held up until the third class of devices are available; however, some meaningful progress can be made in the near future using devices of the second variety. This paper is largely devoted to a discussion of two such devices: high-voltage (Kirlian) photography and acupuncture-point monitors. The final portion of the paper deals with an expanded model of substance that seems sufficient to circumscribe known psychoenergetic phenomena so that we can gain some idea of how nonphysical energies may give rise to physical effects.

HIGH-VOLTAGE PHOTOGRAPHY

Review of Some Soviet Work (26)

In this section, the important features fall into three categories: (a) the operating characteristics of the electrical power source and the postulated mechanism of device functioning; (b) the configuration and components of the information display and recording devices, and (c) the general experimental results obtained.

Adamenko (3) has indicated that the power source should be a pulsed high-frequency field, somewhat similar to a radar power source. The pulse characteristics are given in Figure 1 and are a pulse height of 20–100kV, a pulse width of 10^{-4} sec to 2×10^{-3} sec generally (as small as 10^{-6} sec in some cases), a pulse repetition rate of 60/sec and an AC frequency of 75–3000kHz. This electric field is applied to a device, such as illustrated in Figure 2, producing a discharge phenomenon



KIRLIAN POWER SUPPLY CHARACTERISTICS

Figure 1. Electrical output properties of the energy source.

that appears to be cold electron emission from living systems (because the current-electric-field relationship follows the Fowler-Nordheim plot). The term *cold electron emission* is used to distinguish it from thermionic emission, which occurs at a high temperature. Cold emission occurs at low temperatures under the stimulus of an applied electric field. It is felt that

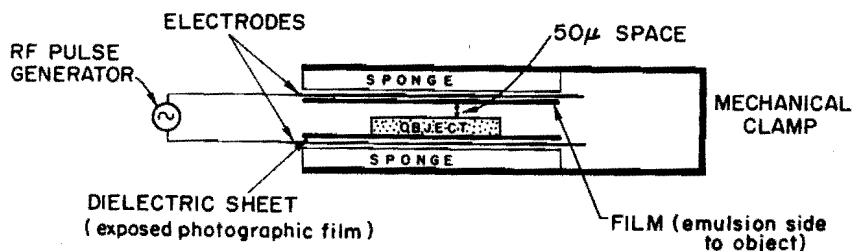


Figure 2. Simple electrode device for taking Kirlian photographs.

the electron work function varies over the surface being photographed, and in air, the picture of the discharge channel occurs as a result of the positive ions clustering around the channel, providing a focusing effect to the electrons.

The Soviet experience was that a single DC pulse would not be effective in producing the desired effect and that it would be rather dangerous to use DC rather than high-frequency AC inside the pulse envelope. Although a static electric field of the same value as used in the AC system ($\sim 10^7$ V/cm) would also yield cold electron emission, the situation is not straightforward, as strong polarization of the electrodes would occur (electrolysis). The Soviets feel that it is necessary to have a discharge spacing between the specimen and the film in order for proper channel formation to occur (as a result of positive ions clustering around the electron stream). The electrons exit from the surface with different velocities, and this includes information about the object. If one uses a DC

power source, equilibration of electrons seems to occur and the image is absent. With DC, in the first few moments an image appears but then disappears later as equilibration occurs. The high-frequency signal is also used in the pulse so that one can decrease the size of the equipment. The use of different frequencies allows one to obtain quite different pictures, presumably associated with different resonances from different cells, and so on—that is, the electrons can come from different parts of the skin.

Actually, one need use only one pulse to obtain a photograph. The slow pulse repetition rate is to provide low average power. It seems that a pulse duration of about 2×10^{-3} sec is maximum and, if pulse width (τ) is much larger, the image is poor. On the other hand, if τ is too small, the channel discharge process does not have time to develop. (For contact photography, one can use $\tau \sim 2 \times 10^{-6}$ sec.) The total current drawn from the entire surface is less than $1 \mu\text{A}$, so that the actual current in a discharge channel is much less. They suggest that this is the reason for the stability of the cold electron emission (3).

The average power of a generator is about 1 W (pulse power is much larger, of course). Thus, quite small generators using batteries, transformers, or transistors can be built and taken out into the field. However, such small generators generally do not have as much stability as one would like.

It has been stated (3) that any discharge includes photons but that only discharges in a strong field produce an image. This seems to relate to electron acceleration that leads to photon emission. Of course, even the radiation damage effect of the electrons hitting the photographic grains can be expected to produce massive exposure of such grains.

In the simplest Kirlian device, shaped like a sandwich or parallel-plate condenser, the object is placed between the two plates to which voltage is applied. If the condenser plates are too close to the object, there will be no effect on the film. In order to get good pictures, there must be a dielectric gap between the object and the film. The exposure time depends on the film speed and on the power density of the electric field.

To improve the effect and augment it, a fine screen (such as a silk screen) may be placed between the object and capacitor plate (and film). The film is between the condenser plate and the screen. This screen enhances the effect, probably by its serving as a dielectric. One type of effective screen material is film itself that has been completely exposed and developed.

The device can be placed in a clamp arrangement as illustrated in Figure 2, the clamp being used to apply a slight, but even, pressure via the paralon (or sponge) pads. The electrodes are developed X-ray film ($\text{AgBr} \rightarrow \text{Ag}$), and the leads are fastened to them as indicated. The dull matt finish of these electrodes provides poor reflectivity of light, and thus, is an

aid to producing a good image. The spacing between object and film is about $50\ \mu$ (it can be $10\text{--}100\ \mu$).

To improve the resolution, a layer of saline water or other conductive liquid is sometimes placed between the object and the film. In this case, the film is placed with the emulsion facing away from the object so that the emulsion will not be disturbed. The capacitor plate is then placed outside of the film. A further improvement can be made by using the conductive liquid as one of the capacitor plates, thereby permitting better resolution and faster work with the film.

For taking pictures of a section of human skin or other part of the body, only one electrode is needed. In this case, the body acts as ground—that is, only one half of the device, presented in Figure 2, is needed. This same electrode procedure is used for the Kirlian microscope, illustrated in Figure 3, when it is applied to the body.

A simple rolling device, which has the advantage of operating at an average power of less than 1 watt, was also described. It is illustrated in

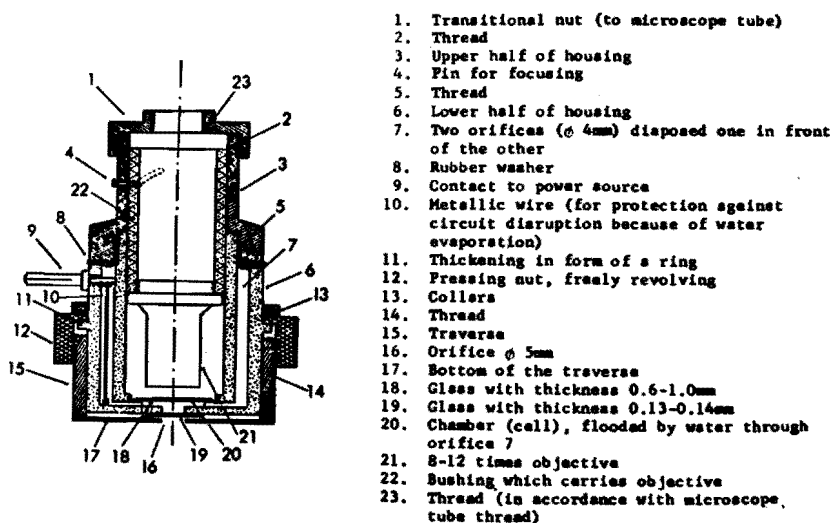


Figure 3. Microscope objective lens housing for direct observation of energy patterns.

Figure 4. In this device, no discharge occurs at points A or C but does occur at point B, where the spacing is about $10\ \mu$. The cylinder is rolled at about 10 cm/min and gives a moving line discharge to expose the film in sequence. A device for taking moving pictures is illustrated in Figure 5. It utilizes the arrangement of Figure 2. Controlled weights are applied to the device, and the film is pulled through at some particular speed while the

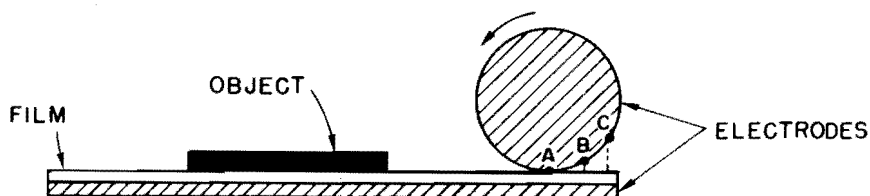


Figure 4. Rolling-cylinder discharge device.

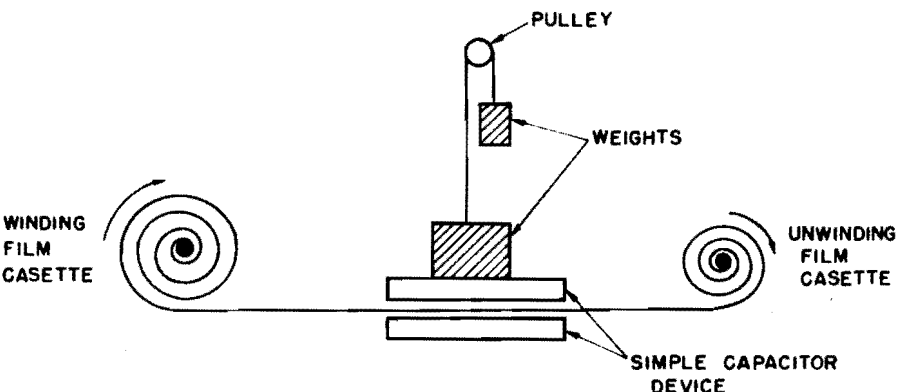


Figure 5. Cinematographic discharge device.

discharge process is going on. The film is rolled in the usual way, and all is contained within a cassette.

In Figure 6, an extremely useful device idea is illustrated. The previous methods utilized rigid capacitor plates, which do not allow one to take pictures of objects having irregular profiles. In the new method (3), the device takes the shape of the body. The transparent electrode is a silicon organic film; however, many other possibilities exist. With this device, any portion of the body can be photographed directly. In fact, one could make a snug-fitting vest or garment of the material, which could then be monitored photographically from a distance or displayed continuously via closed-circuit TV.

This new method grew out of an earlier idea of Kirlian's (12) that utilized a conductive transparent material as part of the capacitor, to which a

EYE OR CAMERA

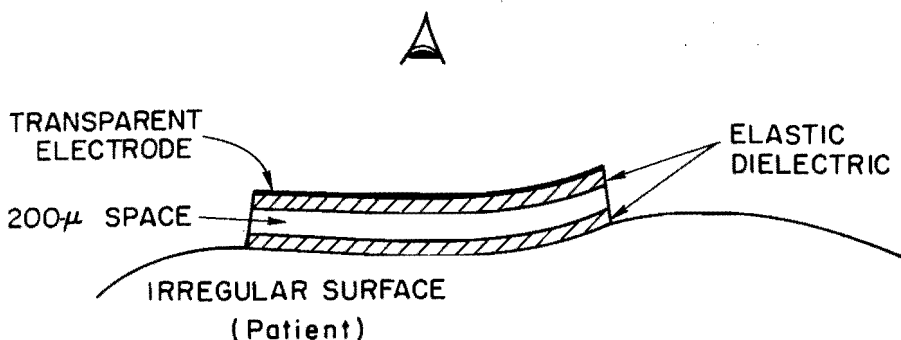
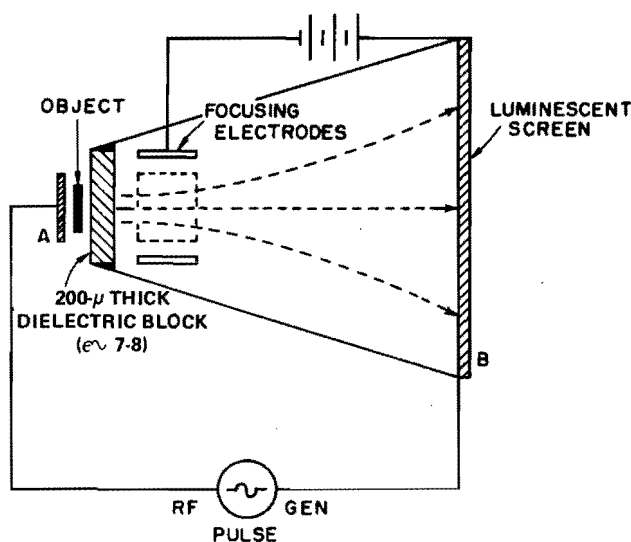


Figure 6. Transparent electrode device for continuous monitoring of energy patterns.



SCHEMATIC KIRLIAN CRT

Figure 7. Cathode-ray-tube device for taking Kirlian photographs.

hinged mirror was attached, and a flexible conductive material laid upon the object to be photographed. The mirror is concave and acts as a lens, enlarging the object to be studied. The mirror is apparently used for visual examination when not taking photographs. Between the object and the flexible, transparent condenser plate is placed a dielectric net. A photographic plate is placed over the front or top of the conductor, so that the prints are merely contact prints without focusing.

The foregoing devices all operate in air at 1 atm pressure. If the pres-

sure is reduced to 10^{-5} mmHg, the image is still retained, provided the electrode separation is increased to 20–30 cm. At a pressure of 10^{-6} mmHg, the image disappears. A visual display system using something like a television tube is illustrated in Figure 7. In this cathode-ray tube (CRT) device, electrons from the object impinge on a $200 = \mu$ thick dielectric film, and their charge pattern induces charge polarization on the other side of the film, which, in turn, affects the preferential geometry of electron emission from the film. Thus, the eventual image on the screen is indeed that of the object. This is a very important phenomenon, for it allows many interesting modifications of device design.

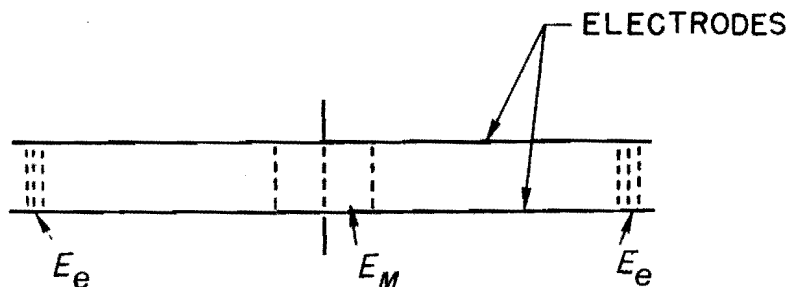


Figure 8. Magnification technique by using different electric fields at the edges, E_e , and at the middle, E_M , in the device of Figure 2.

The methods have been developed for image amplification (magnification). In the first case, they use cold emission obtained in the small spacing device (50μ) of Figure 2 with a high electric field at the edges, $E_e \sim 10^6$ V/cm. However, E is caused to decrease in the middle to $E_M \sim 10^4$ V/cm (see Figure 8). Thus, the magnification, μ , is given by

$$\mu = \frac{E_e}{E_M}$$

They have obtained values of $\mu \sim 340$. The second method is carried out in a CRT-type device as illustrated in Figure 9. The short electrode (cathode) has a field E_1 , and the larger electrode (anode) has a field E_2 ($E_1 \sim 10^6$ V/cm, E_2 is smaller). In this case, the magnification, μ , is given by

$$\mu = \frac{E_1}{E_2} = \frac{S_2}{S_1}$$

where S_1 and S_2 are the tension of the two electrodes ($S_1 E_1 = S_2 E_2$ from Gauss's law and charge conservation).

Using the TV-tube type of device, one might expect that the use of

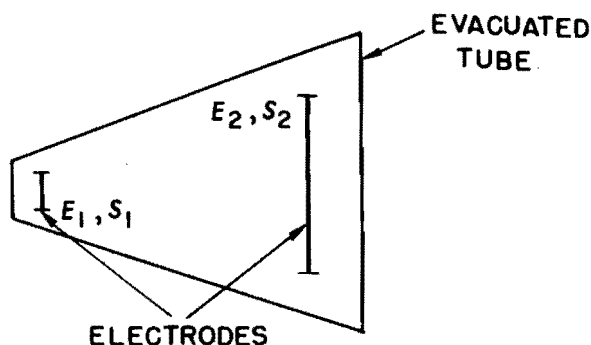


Figure 9. Magnification technique using electrodes of area in cathode-ray-tube device.

electron lenses would allow one to build an electron microscope with very high magnification ($\sim 10^4 \times$). However, because of a high vacuum needed in such a device, a severe limitation exists. At $10^{-7} - 10^{-8}$ mmHg pressure, one gets no image because of the loss of channeling ions, but at $10^{-4} - 10^{-5}$ mmHg, one does not even need a lens.

It is generally quite inconvenient to be performing these experiments in a dark room. This procedure can be avoided by utilizing an aspect of the technique illustrated in Figure 7. Since an image of the object's energy pattern can be transferred through a thin dielectric film, it should be possible to use either a nontransparent envelope enclosing the sample or a nontransparent envelope enclosing the film. This is illustrated in Figure 10. This technique is in common use in the Soviet Union and greatly increases the practicality of the device for use in air under normal illumination.

On the Kirlian photographs one sees an image of the structure of the surface plus a surrounding halo caused by a high-frequency discharge.

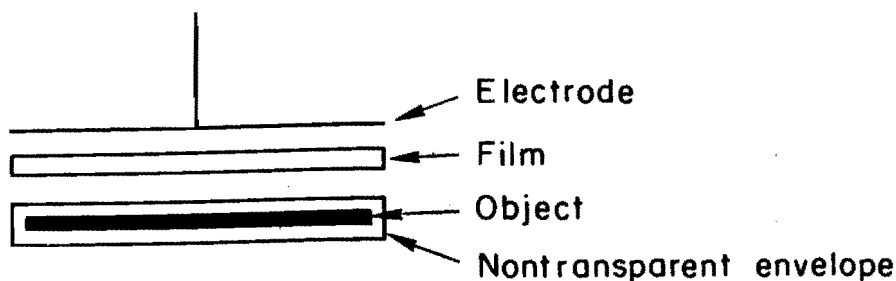


Figure 10. Schematic illustration of the envelope technique for taking photographs in a lighted room.

Both the dimensions of the halo and the overall brightness of glow change in accordance with changes in the physiological state of the organism. Different sections of skin surface are found to emit radiation in characteristically different colors: the heart area shows as dense blue; the hip shows as an olive; the forearm shows as greenish light blue. As a result of sudden emotional excitement (fear, pain, etc.), the color of the related section changes.

Using a high magnification system, one sees discharge channels arranged on the background configuration of the skin, and they exhibit a variety of energy-emission characteristics (2). They may be pointlike, crownlike, flarelike, or clotlike. They may have different coloring such as sky blue or various shades of lilac or yellow, and they may be bright or faded. Some of the channels glow constantly, some are twinkling, some flare up periodically, some are stationary, and some are always moving from place to place. In certain sections of the skin, one sees immobile flareup points that exhibit a definite rhythm and are light blue or golden. Besides these points, there are faded clots of indefinite form, taking from time to time a spherelike form. Some clots are continually spilled out from one point of the skin onto another where they are absorbed. The spilling out of one clot does not take place until the previous clot has been absorbed. In certain cases the luminous clots are not oriented in their movement. They slowly move between the flares and finally are extinguished with a little burst and seem to dissolve into space. The colors of the clots are generally milk-light blue, pale lilac, or grayish orange. In many respects these flares and clots resemble the plasma behavior often observed in observations of the sun.

They have found that a withered leaf shows almost no flares and that the clots barely move. As the leaf gradually dies, its self-emissions also decrease correspondingly until there is no emission from the dead leaf. Likewise, the finger of a human body, dead for several days, exhibits no distinctive self-emissions. The self-emission of living things seems to be a direct measure of the life processes occurring within their system.

The structure and emission characteristics of these discharge channels can be utilized for an objective evaluation of the physiological state of the living organism, for diagnosis of body health or pathology, for registration of the emotional state, and also for the control of the system's response to various radiations. For example, during the radiation of living objects with a laser ($\lambda = 6328 \text{ \AA}$), one observes a sharp increase in the intensity of discharge flaring. However, daylight radiation (incoherent radiation) of the same intensity does not cause any changes in the discharge process.

A special investigation of the high-frequency discharge glow from the leaves of plants revealed the existence of a series of peaks (4200 \AA , 4250 \AA , 4550 \AA , 4750 \AA) and several small peaks in the red part of the

spectrum. If the plants were irradiated by a laser with λ -6328 Å, then the glow spectrum from the leaves was altered in the blue and green regions, so that characteristic peaks appeared at 5100 Å and 4800 Å and the spectrum shifts in the range 4400 Å-4500 Å. However, the number of peaks in the blue part of the spectrum remained unchanged. With the skin of animals (mainly rabbit), the peaks were found in the range 4950 Å-5000 Å, and the short-wave portion exhibits a peak structure coinciding with that from leaves.

If one photographs on the same film at the same time the fingers of two different people, then a crown discharge is seen around each finger. As the two fingers are brought closer together, the crowns of discharge deform and leave a small gap between them rather than interpenetrate. Using the fingers of three people, one again sees crown deformation and no penetration.

When observing the palm of a psychic healer as he begins a healing session, one initially sees many points flaring and then fewer points, but the area of discharge around the remaining points is larger (greater flare intensity) and eventually an area the size of a dime in the center of the palm becomes luminously brilliant. At this point, the healer is optimally attuned and the patient feels what is usually described as "heat" in the area of his body to which the healer is directing energy. By careful study of the location of the major flare points on the body, the Soviets have shown them to correspond to the active points marked on the Chinese maps of acupuncture points.

In concluding this section we should mention perhaps the most interesting and exciting experimental observation. In Figure 11a a photograph of a whole leaf is given showing the edge halo and inner light structure. It has been claimed that if 2-10% of a leaf has been cut away from one edge, the photograph shows not only the portion of the leaf remaining but also an energy pattern from the portion of the leaf that has been physically removed. In Figure 11b, we see such a cut-leaf photograph with the right-hand edge of the leaf removed and we note the remaining radiation pattern (albeit altered in contrast). It has been suggested (3) that the number of radiation sources in the leaf may be so numerous as to produce sufficient redundancy of information that when a portion of the leaf is removed, the lost sources do not significantly disrupt the multiple array pattern. It is also found that when one erases a person's fingerprint (by sanding it off), the Kirlian photograph clearly reveals the fingerprint (probably because the energy flare points are located only along the dactyloscopic design of the skin).

The Soviet scientist Inyushin has suggested that in living systems there is a single system of elementary charged particles that is dominant in all biodynamic relationships of the living organism. He has called this hy-

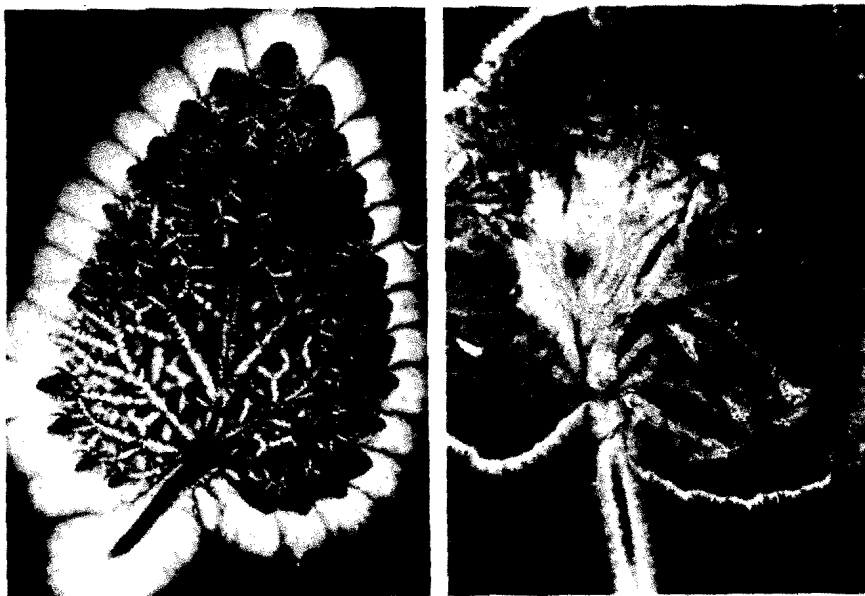


Figure 11. (a) Kirlian photograph of a whole leaf (courtesy of V. Adamenko). (b) Kirlian photograph of a cut leaf (courtesy of V. Adamenko).

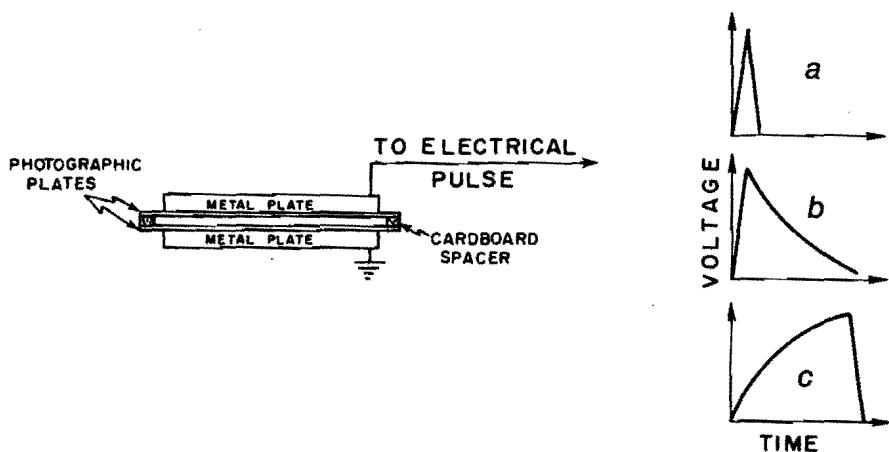


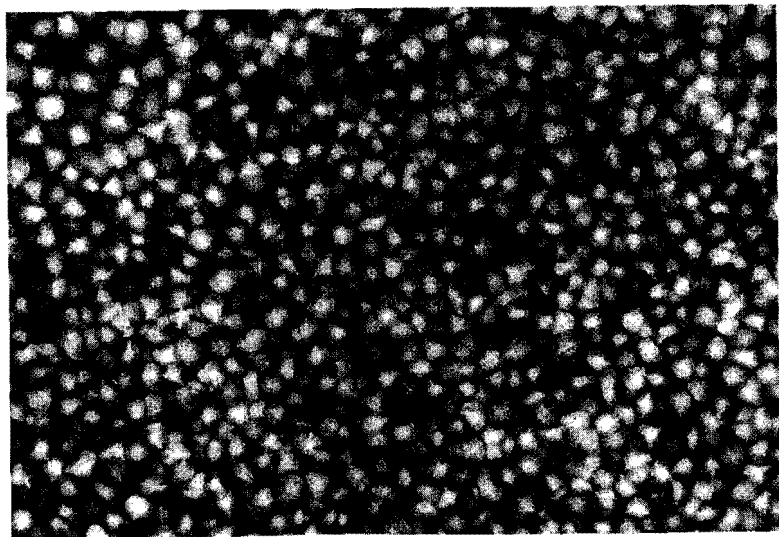
Figure 12. The method of exposing the photographic plates to a pulse of electricity with three of the types of pulse employed: (a) a rapid rate of pulse increase and decrease, (b) a rapid increase and slow decrease, and (c) a slow increase and rapid decrease.

pothesized system of elementary particles, "biological plasma." This biological plasma, or "bioplasma," as distinguished from nonorganic plasma, is a structurally organized system and the chaotic thermal randomization force is reduced to a minimum—that is, the entropy is minimal. Bioplasma is found to be strongly influenced by changes in temperature and other environmental factors.

Review of Some English and American Work

Milner and Smart (14) have for some years been experimenting with high voltage photography using a sandwich-type device similar to Figure 2. However, their work differs significantly from the Soviet work in that they use a DC pulse technique and control the process by controlling the slope of the leading and trailing edges of the pulse as illustrated in Figure 12. They are unable to detect any energy in the visible range; however, there is abundant new information to be found in the far ultraviolet. The pulse voltage used with their technique is in the range 5000–20,000 V, and great care must be exercised during the course of experimentation, because of the significant electrical power involved.

Using the arrangement of Figure 12, during application of the voltage across the empty cell, nothing visible occurs in the air gap during the voltage pulse, but one finds that the photographic emulsion has been exposed on both the positive plates and the negative plates, as illustrated in Figures 13a and 13b. The energy patterns on these complementary



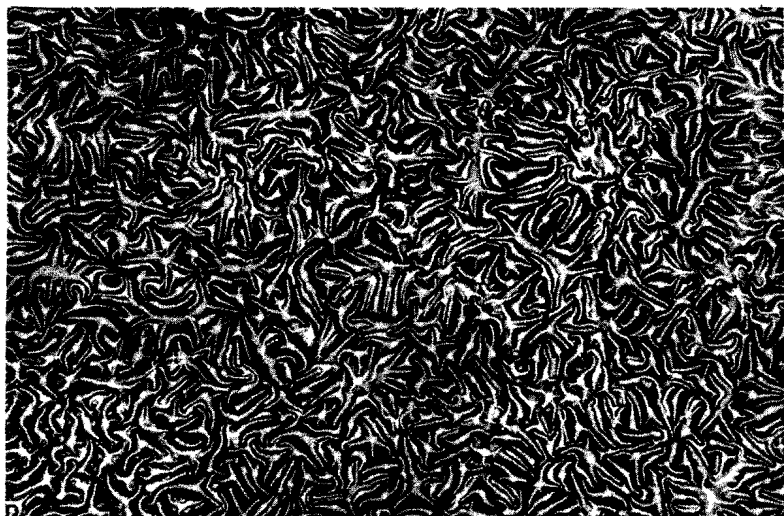


Figure 13. (a) Photographic result on positive side of "sandwich" with intermediate rates of pulse increase and decrease. (b) Photographic result on negative side of "sandwich" (courtesy of Milner and Smart).

plates are quite different even though they were located only 75μ apart. Steepening the rate of field decrease on the trailing edge of the pulse leads to Figures 14 and 15 for the positive plates, where Figure 15 had a much more rapid rate of decrease than Figure 14.

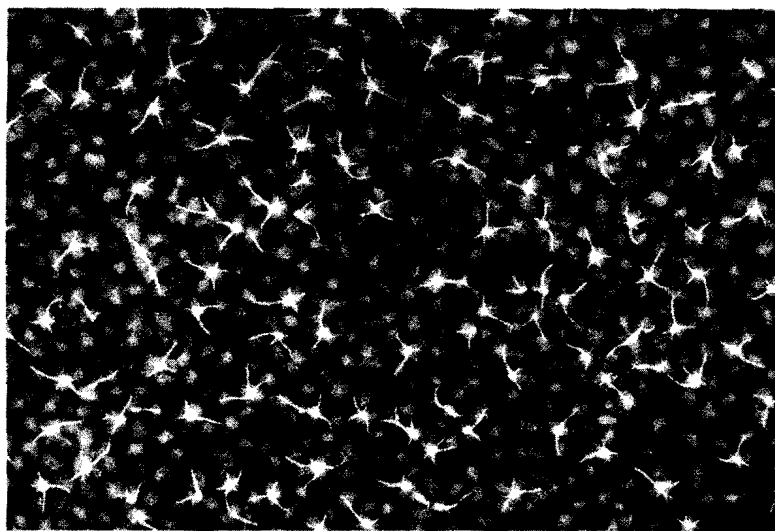


Figure 14. Photographic result on positive side with steeper rate of pulse decrease than in Figure 13a (courtesy of Milner and Smart).

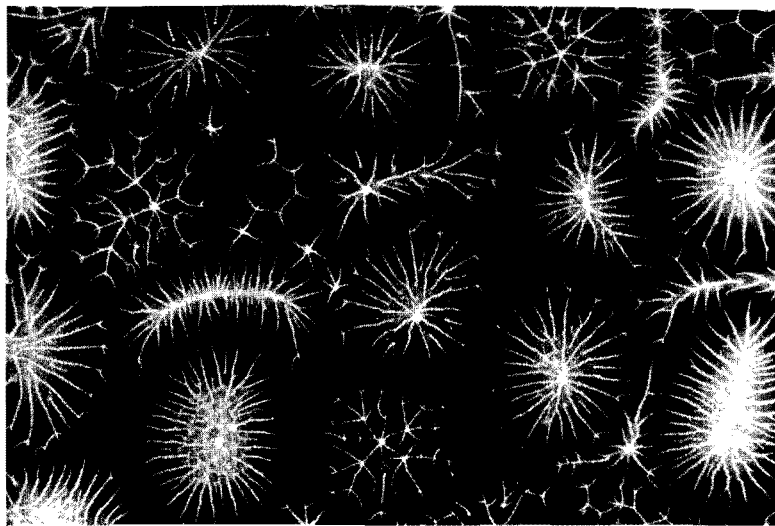
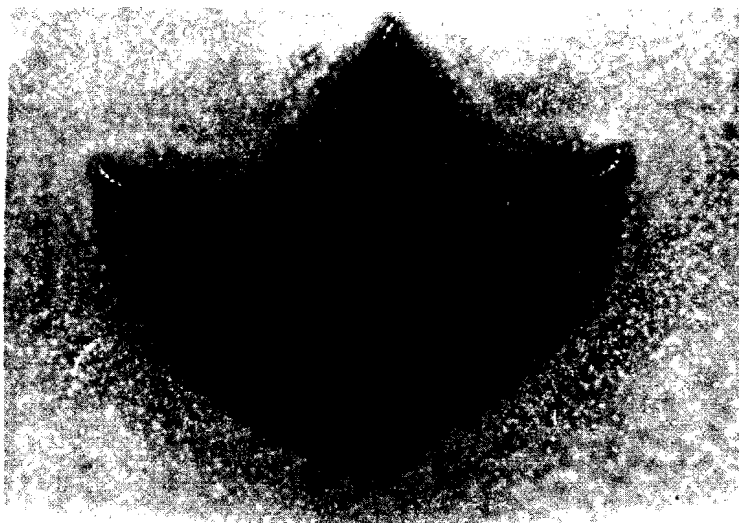


Figure 15. Photographic result on positive side with still steeper rate of pulse decrease than in Figure 13a or 14 (courtesy of Milner and Smart).

Inserting a leaf or spray of leaves into the sandwich leads to Figure 16a for the positive plates. Here, using a rapid pulse, the leaves are hardly registered and are separated by a type of void space from the surrounding empty-sandwich pattern. With a more prolonged pulse, areas of the leaves become luminous and bright balls of plasma gather at the tips of the leaf serrations and begin to become detached and freed into the surrounding atmosphere (see Figure 16b). Maintaining the voltage for increasingly longer periods of time leads to the formation and detachment of more of these bright balls until the flow becomes exhausted and the leaf reverts to its original "dark" state (see Figure 16c). In Figure 17, we see an example of an energy transfer interaction between a freshly picked privet leaf (right) and a dying leaf picked 24 hours earlier.

Obviously, we are dealing, here, with a very complex phenomenon. Some of these results are at considerable variance with those of Soviet researchers; however, they will eventually help us to understand the phenomena involved in this process more completely.

From this work, we can begin to suspect that dielectric breakdown between heterogeneities in the plates may be playing an important role. In addition, bombardment of the two plates by different types of ions (positive and negative) may be playing a role in the different photographic effects produced on opposite plates. This would be accentuated by surface irregularities. (Soviet studies have shown that a surface roughness of 3.2μ can be observed on exposed film with the unaided eye.)



Monteith (15) has built what is perhaps the simplest and cheapest high-voltage device for illustrating the photographic effect. The circuit diagram is illustrated in Figure 18. From such a simple device one cannot anticipate much stability or controllability of device operation.

Monteith (15) found that a live leaf gave beautiful and varied emissions

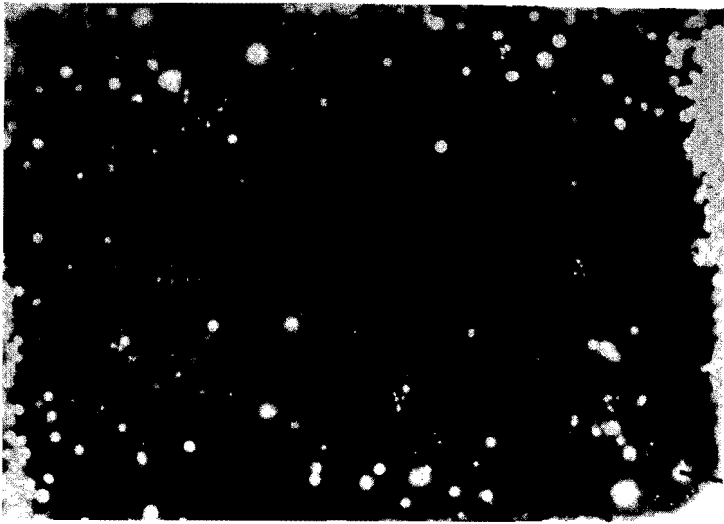


Figure 16. (a) Result on positive side with a rapid pulse for a spray of leaves in sandwich (courtesy of Milner and Smart). (b) Result with more prolonged pulse (courtesy of Milner and Smart). (c) Result with still more prolonged pulse (courtesy of Milner and Smart).



Figure 17. Example of transfer interaction between a freshly picked privet leaf (on right) and a dying leaf picked 24 hours earlier (courtesy of Milner and Smart).

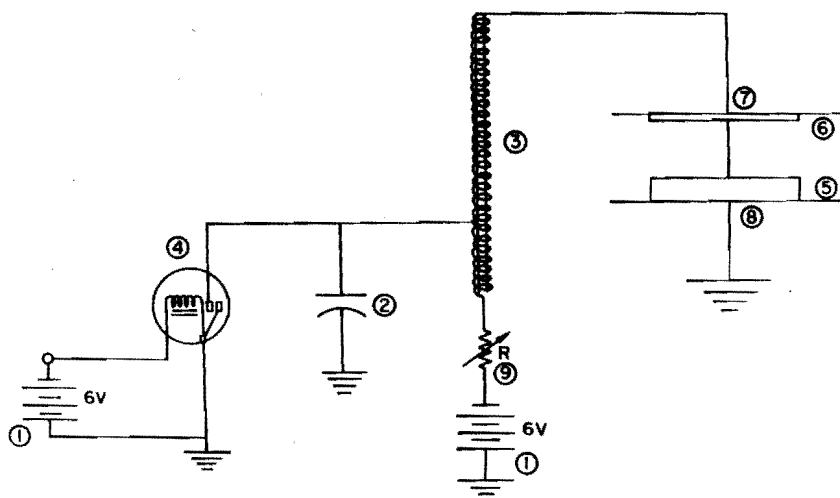


Figure 18. Simple autoinduction-coil discharge system. (1) any 6-V source that can deliver at least 4 A; (2) a capacitor used in conjunction with the autoignition coil; (3) an autoignition coil; (4) a 6-V vibrator used to power autoradios (only one set of contacts need be used); (5) the object being photographed; (6) photographic film (Land type 58 is one of the best to use with this simple circuit; this is color film, but it is slow and seems to be relatively insensitive to voltage breakdown across the capacitor but very sensitive to emission from the object); (7) a capacitor plate at the high side of the emission coil (about 34,000 V placed on the plate); (8) grounded capacitor plate; (9) a variable resistor to give some control of the output voltage.

but that a dead leaf gave, at most, only a uniform glow (generally, it did not expose the film at all). Even when a dead leaf was thoroughly wet with water, in no way was the self-emission increased.

In the high-voltage device designed by Johnson and used by Moss and Johnson (16), the AC field was of low frequency ($\sim 10^2$ – 10^4 Hz) in contrast to the Soviet work ($\sim 10^5$ – 10^7 Hz), and yet good photographs have been obtained. They find that, with the same object, a change in the frequency leads to alternate zones where pictures appear and do not appear, depending on the frequency range. This suggests that some type of harmonic or wave diffraction effect is operative here. The Soviet cut-leaf effect has not yet been reproduced anywhere in the United States.

The Stanford device (6) was designed to approximate the Russian technique. The equipment is presented in Figure 19 and was used to carefully study metallic electrodes. Using short (~ 100 μ sec) pulses of RF (1 MHz) applied to parallel electrodes in air at small electrode spacings (~ 250 μ) and at an applied field of $\sim 10^6$ V/cm, discharges from both biological

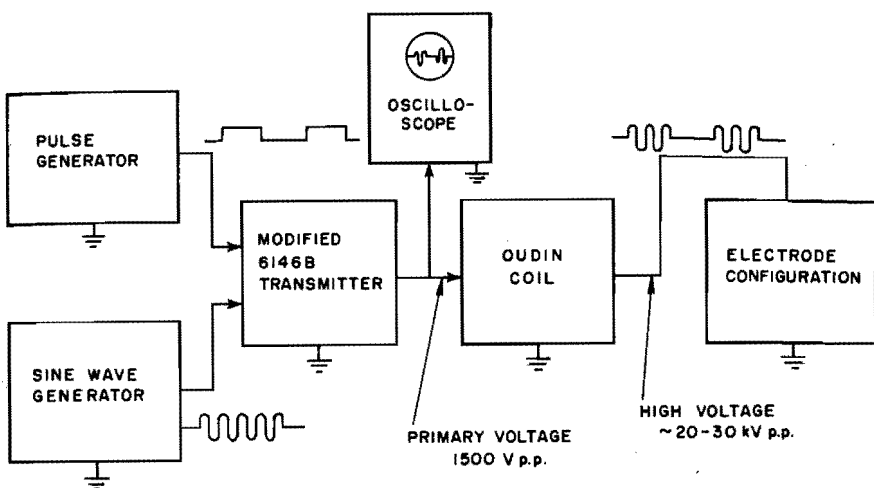


Figure 19. Block diagram of equipment built by authors.

and metallic electrodes occurred from a network of points in the electrode surface. These discharges were recorded photographically and are illustrated in Figures 20 and 21. Multiple pulses led to a superposition effect such that a uniform corona exposure appeared on the film. The results were found to be completely explicable in terms of the streamer phenomenon of corona discharge. In fact, *the wide variety of color effects observed in Kirlian photography can be accounted for by this mechanism.* These results (6) illustrate that future Kirlian photography experiments must be done more carefully than those in the past if we are to use this as a tool truly to learn new information about changes in energy states of living systems. Certainly, the standard ionic processes discussed by Loeb (13) and others (5, 8, 17) are intimately involved here, and it is probably more appropriate to use the name "corona-discharge photography." Any new energies that may also be involved here must be determined by the careful experiments of the future.

In air at high field strengths, the normal color of the streamers is a bright blue, since the most frequently excited radiation is from highly excited nitrogen molecules. Rare yellow flashes in the streamer corona are thought to be due to the presence of sodium from salt.

The main reason for the presence of color other than blue and white, in the contact photographic process, is that it is associated with film buckling, so that streamers form between the electrode and the back side of the film and blue light enters the film from the back side to expose the red and green layers as well as from the front to expose the blue layers. However, the film buckling appears to be a nonrandom event.

A review of conventional DC-streamer studies with point-to-plane configuration illustrates the different discharge morphologies associated with (a) positive or negative points, (b) the presence of electropositive or electronegative gases, (c) film spacing, and (d) pulse shape to substantiate the streamer mechanism as the responsible physical mechanism for the generation of light in high-voltage photography (27).

Finally, there appear to be five ways in which psychoenergetic effects

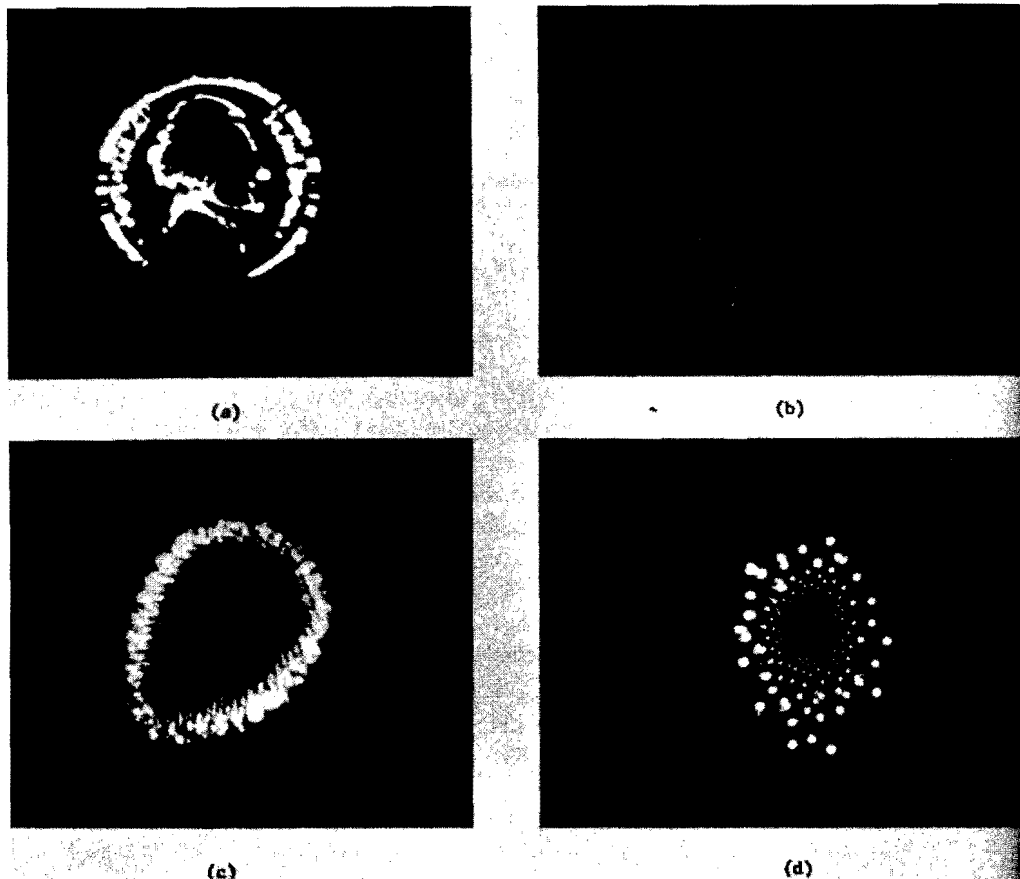


Figure 20. (a) Photograph of coin (U.S. nickel): multiple pulses, pulse width = $100\ \mu\text{sec}$, rep. rate = 20 Hz, duration $\sim 2\ \text{sec}$ ($2\times$). (b) Photograph of coin (U.S. nickel): single pulse, pulse width = $100\ \mu\text{sec}$, rep. rate = 1 Hz ($2\times$). (c) Photograph of fingertip: multiple pulses, pulse width = $100\ \mu\text{sec}$, rep. rate = 20 Hz, duration $\sim 2\ \text{sec}$ ($4\times$). (d) Photograph of fingertip: single pulse, pulse width = $100\ \mu\text{sec}$, rep. rate = 1 Hz ($3\times$).

can alter the details of the streamer process: (a) by alteration of the electrostatic potential of the biological electrode that influences streamer length, (b) by a change in surface chemistry giving rise to electronegative-ion effects and perhaps weak direct color radiation, (c) by polarization-induced diffraction effects due to both shape effects and dielectric-phase-angle effects of the electrode material, (d) by emission of resonant frequency radiation from the cells (bioplasma may possibly enter here), and (e) by altered electrical impedance of the electrode material that controls the discharge current and thus the streamer intensity (plus film buckling).

ACUPUNCTURE-POINT MONITORING

As is now fairly well known, acupuncture is an ancient Chinese art of preventive medicine. The old practice was that people would go to their doctor about once every quarter and pay him to have their "circuits" checked and balanced using acupuncture techniques and stimulation. Because of this, they were supposed to be free from illness. If they happened to become ill, folklore tells us, the doctor paid them by treating them free of charge.

The early theory, at a fairly simple level, indicated that there were 12 main meridians in the body (very much like electrical wiring, figuratively speaking) which acted as prime energy circuits for the body. There was thought to exist a deep inner circuitry connected in some way to the inner organs and body systems and a shallow subsurface circuitry connected to the acupuncture points. It was felt to be essential for the health and well-being of the body that there be sufficient energy in these circuits and that they all be balanced with respect to each other—that is, that there be an equalization of energy between the various meridians of the overall system. The energy flowing in the circuits was thought to be a fluid called "chi" ("qi" and "ki" are variant spellings). The function of the acupuncture stimulation was primarily to take energy out of one limb of a circuit and put it into another. By shifting these energies around, one obtained a balanced system with continuously flowing energy.

Disease was thought to arise as a result of any major imbalance in what one might naively think of as an irrigation principle. Thus, if there was not enough energy flowing in one meridian, the body systems associated with that circuit had an altered energy terrain, and the environmental energy fields were such that the soil became more favorable as a nutrient for bacteria to grow and thrive. This altered energy condition led inevitably to manifestations of disease at the physical level.

In more recent times, we have become aware of the rather remarkable application of acupuncture to anesthesia and perhaps the even more re-

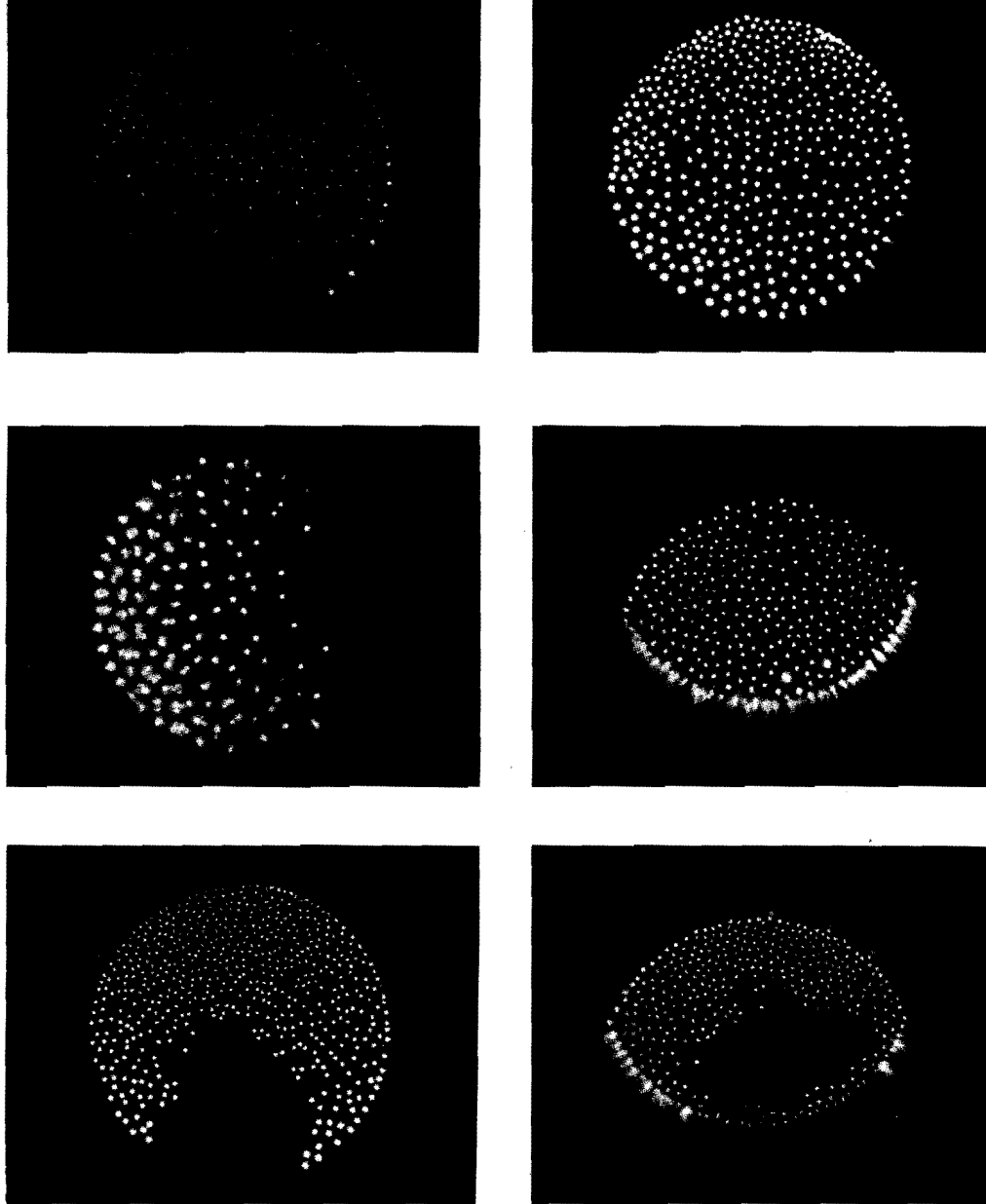
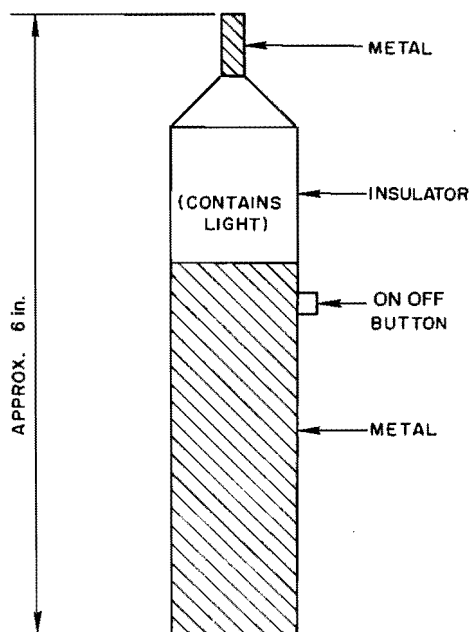


Figure 21. Photographs of single-pulse discharge between flat, polished brass electrodes under conditions of different pulse exposure, electrode spacing, and orientation ($4\times$). (a) Pulse width = $100\ \mu\text{sec}$. (b) Pulse width = $500\ \mu\text{sec}$. (c) Pulse width = $500\ \mu\text{sec}$; nonparallel d , slight increase in discharge spacing d . (d) Pulse width = $500\ \mu\text{sec}$; electrode areas nonconcentric. (e) Pulse width = $500\ \mu\text{sec}$; local film buckling. (f) Pulse width = $500\ \mu\text{sec}$; local film buckling for nonconcentric areas.

markable observation that the patient can even eat food while undergoing a major operation. This latter seems to be in gross violation of presently accepted ideas of necessary sterilization conditions in an operating room. Because of the Western focus on applications to anesthesia, models of structure and functioning of the meridian system have begun to localize around equation with the nervous system. However, it has also been postulated that this meridian system of the body is a fourth circulatory



RUSSIAN "TOBISCOPE"

Figure 22. Schematic drawing of Adamenko tobiscope.

system of the physical body distinct from, and on a level equal with, the blood, the lymph, and the nerve systems. We should keep our minds open to this larger possibility rather than relegating all the emerging data to the more limited model of another behavior characteristic of the nervous system.

Using a special resistance-measuring device, the tobiscope (3), the Soviets have located a network of low-resistance points on the surface of the body which is in 1:1 correspondence with the acupuncture points on the Chinese charts. The device, illustrated in Figure 22, consists internally of a bridge circuit so arranged as to be balanced by the normal skin resistance and unbalanced when making contact with an acupuncture point. The electrical signal due to the imbalance is applied to a DC

amplifier, which boosts the signal so as to activate a light bulb located in the front portion of the device (in other devices, the signal activates an audio speaker). This device is held in one hand (making contact with the metallic base) and the point is applied to the skin of the subject, while the other hand of the operator is in contact with a different portion of the patient's skin. Thus, an electrical circuit is made from the base of the tobiscope, through the body of the operator, along the body of the subject to the tip of the tobiscope, and, via internal connections, to the base of the device. Moving the point over the skin with light pressure, one can locate a network of points that cause the light to be activated in the device. A shift of the tip by about 1 mm removes the tip from these special points, which locate the low-resistance paths through the body. One also finds a network of such points in plants and animals.

The Adamenko (3) device operates on less than $1 \mu\text{A}$ at 4 V, with the 3-transistor DC amplifier being very stable over the range of 1.3–3.5 V. The input resistance is about $4\text{--}5 \times 10^6 \Omega$, and the device needs dry skin to be effective in locating the acupuncture network points (wet, salty skin leads to surface shunt paths). Adamenko finds that a resistance of about $5 \times 10^4 \Omega$ exists between these network points and that the value increases by a factor of 2–3 during sleep. Over the same length of normal skin between two network points, the equivalent resistance is $\sim 10^6 \Omega$. At present, the Soviets are investigating an AC device and are finding interesting results in the region of 10^3 Hz . Interestingly enough, this author finds the resistance ratio between normal skin and acupuncture points to also be 10:1; however, the value of the resistance is larger by a factor of about 5.

The DC resistance between any two acupuncture points on the body differs by less than a factor of 2, suggesting that almost all of the resistance is embodied in the thin layer of epidermis. A similar range of resistance variation occurs because of emotional change, mental concentration, light stimulus, and the like. In the case of emotional excitation, the points vary in diameter (as revealed by conductivity area) and there is the possibility of the areas overlapping one another to form high-conductivity regions.

An alternate circuit, for point location, is given by Devine (9, p. 117). Its major disadvantage is that it draws too much current and produces some polarization effects. A circuit that avoids this difficulty and also produces an audio signal is presented in Figure 23 (21). In this case, less than $1 \mu\text{A}$ of current is utilized and the frequency of the sound increases as the conductivity of the area increases.

Adamenko (3) has investigated the relationship between the conductivity of the network points and certain states of hypnosis of the patient. His results are given in Figure 24, in which the different states of conscious-

R_s = RESISTANCE OF SKIN

M = Milliammeter

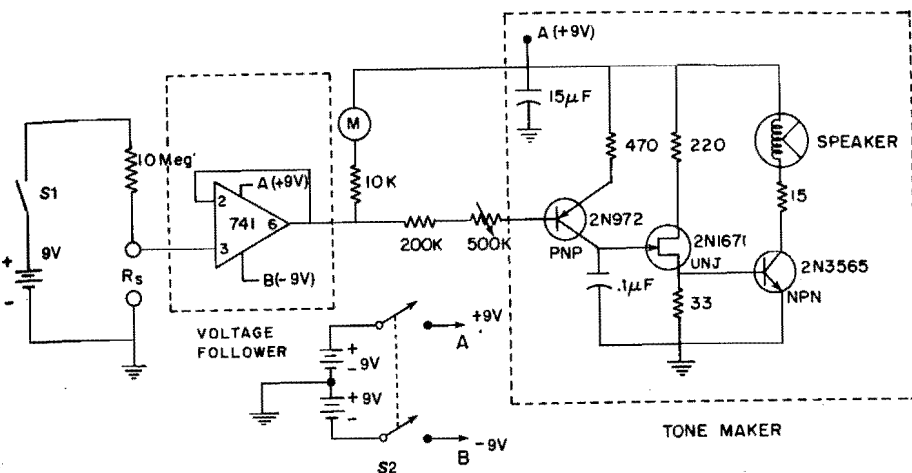


Figure 23. Circuit diagram for an audio-signal acupuncture-point locator.

ness are listed along the abscissa as (a) ordinary working state, (b) sleep with eyes closed, (c) sleep with eyes open, (d) suggestion of hallucinations, (e) "artificial reincarnation" (a particular hypnotic condition), and (f) work in the reincarnation state. The four graphs show variations in four groups of subjects ranging from control group A (those not hypnotizable) through B, C, and D in increasing order of hypnotizability. As seen from the graphs, there exists a certain relationship between the patient's hypnotizability and the character of the conductivity variations. In the control group, no conductivity variation has been recorded that indicates the absence of emotional reactions to the hypnotist's words. However, in the case of ordinary emotional states, these patients exhibit conductivity variations.

Adamenko has also discovered that a voltage signal can be detected between two network points if two different types of metals are used as electrodes. On dry skin using plated circular electrodes (5–7 mm in diameter), a nickel–silver combination yielded a potential difference of about 50 mV. At skin locations where such points are absent, the potential difference is close to zero. Likewise, using the same electrode material—say, nickel–nickel or silver–silver—the potential difference is again close to zero. The greater the work function difference between the two materials, the greater is the voltage developed. This suggests that we have a galvanic-cell effect operating here. The current drawn from this battery is about 10 μ A. However, because this current level polarizes the elec-

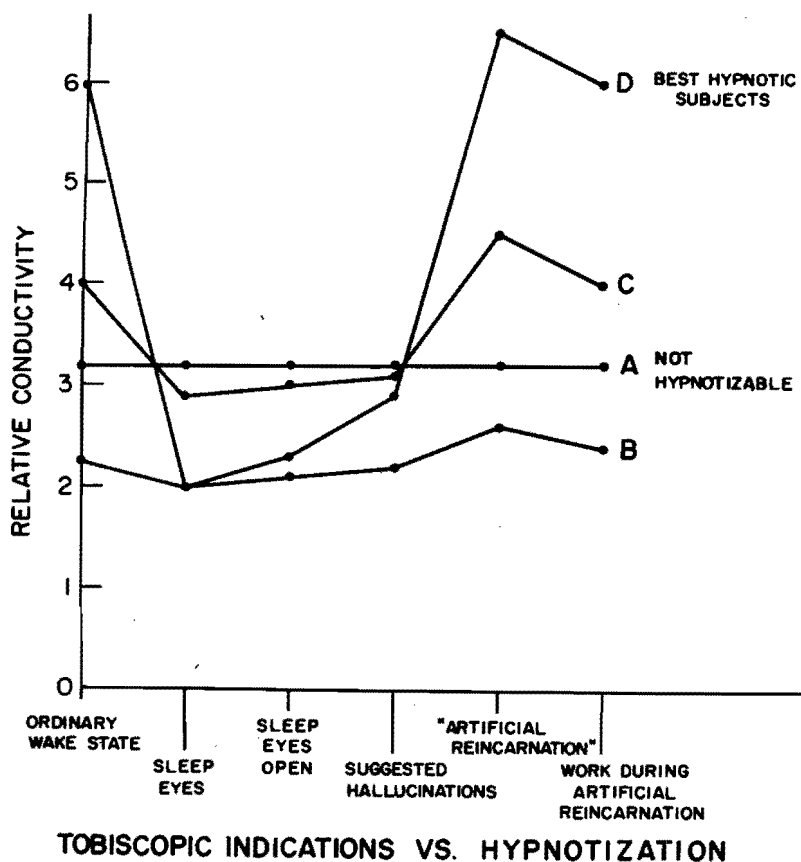


Figure 24. Relative conductivity indications versus hypnotic state of the subject.

trodes, one is advised to use an impedance in the measuring circuit to reduce the current to levels below $2 \mu\text{A}$ and then to amplify the signal for display purposes. In cases of emotional, volitive excitation, the potential difference may increase up to 100 mV. Further, using parallel connections between several network points, the voltage obtained may be as high as 0.5–1.0 V with a corresponding increase in saturation current.

The Soviets find that as the electrode area increases, the developed voltage increases. They also find that the amplitude of an AC pulse is diminished as the electrode area increases, which probably represents an averaging phenomenon wherein the AC signal arises only at the acupuncture point (less than 1 mm in diameter) in the central region of the electrode.

Adamenko performed an interesting healing experiment utilizing what the Soviets call the "semiconductor effect." When measuring the resistance between symmetrical points on the left and right sides of the body, one often finds that the resistance is different in the forward (R) from that in the reverse (R') direction (just like a semiconductor material that contains p-n junctions). If the person is healthy relative to that meridian or particular organ in that meridian, then the resistances will be the same ($R = R'$). However, if the person is ill relative to that organ or relative to an organ associated with that meridian, then one will find a difference in resistance ($R \neq R'$). This difference, ΔR , is called the semiconductor effect.

In the healing experiment Adamenko (1) used a manual healer who projected energy via his hands located a short distance from the patient. The semiconductor effect was measured on both the patient and the healer before the experiment and also after the experiment. The data given in Figure 25 was obtained. We can suspect that some energy was transferred from the healer to the patient because the value of ΔR had decreased for the patient. However, we note that the healer's circuits have become somewhat unbalanced in the process (temporarily). This suggests that the healer gave up a particular kind of energy in a particular location of his body in order to bring into closer balance the circuitry of the ill individual. *This appears to be a new type of energy that we have heretofore been unable to monitor in any numerical or objective way.* The author has tried a similar experiment with a patient and healer while monitoring the acupuncture points and found similar results except that there was only a small change in the healer, and ΔR for the patient changed over a period of a week after treatment eventually decreasing to zero. During this time period, both R and R' increased by a factor of 2.

It has been noticed that when a serious imbalance exists in the meridian circuitry and a needle is placed into the appropriate point, a force (almost like a suction force) holds the needle in the point, so that if one tries to withdraw it, the skin pulls up around the needle and it is not easily withdrawn. After the needle has remained in the point for a sufficient length of time to have brought about a temporary balance to the circuits, the needle may be withdrawn with no effort and the skin no longer pulls up around the needle. This suction force seems to be proportional to the degree of imbalance (i.e., to ΔR).

There are, at present, several ways in which one can produce point stimulation, and it appears that to bring about balance to the circuits, all one needs to do is stimulate the acupuncture points sufficiently. In increasing order of effectiveness, the various techniques are (a) chemical stimulation, (b) manual massage, (c) acupuncture needles, (d) electrical energy injection (requires sophisticated understanding), (e) laser beam

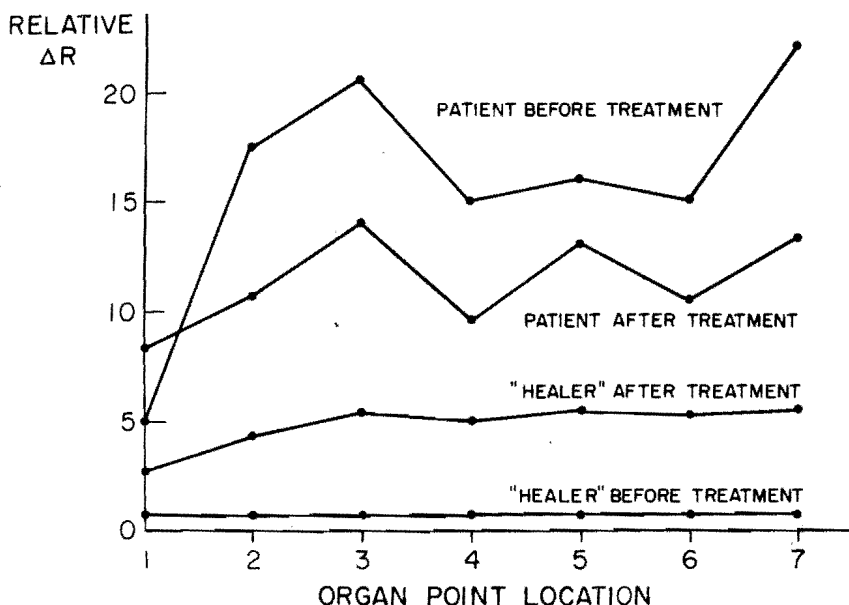


Figure 25. Representation of the semiconductor effect observed in paranormal healing.

(requires sophisticated equipment and understanding), and (f) an injection of "spiritual" energy from a psychic healer. This latter seems to be the best procedure for bringing about bodily balance (the energy does not need to be directed at a specific point or set of points). Using the laser-beam method, the Russians have found that when a mild-intensity laser beam is directed at the acupuncture point above the upper lip, it will immediately stop an epileptic seizure. Considerable possibility exists for the use of point monitoring in a biofeedback mode so that a patient can learn to stimulate various energy centers of his body or to control the development of pain.

A GENERALIZED MODEL OF SUBSTANCE

In order to make progress in the design of suitable sensing devices, we need a starting model. First, we should be clear about what is meant by a model. A model can be thought of as a working hypothesis. It is a conceptual framework from which we can start to try to understand some aspects of nature. It is a target at which we can start throwing experiments. In the beginning, it is the first discrimination of ideas within some format or structure that gives one a feeling he is starting to grapple mean-

ingfully with the particular unknown area under consideration. As one begins to model the phenomenon, one is able to formulate the right kind of experiments for testing a hypothesis and then can perform the experiments and obtain feedback of new and pertinent information. This allows one to check out whether a particular aspect of the model is correct and to make corrective changes throughout the model as need requires. However, to do this, one must have a place to start. Thus, models are like the rungs of a ladder with which one climbs from one level of understanding to another. *All models are incorrect at some level of detail.* Their purpose is to present an idea that stimulates the thinking function—to move one into a new train of thought. They serve the tremendous function of allowing one to climb from one position of understanding of the universe to a more enlightened position of understanding.

Many phenomena seem to arise in the area of psychoenergetics that are not readily explicable in terms of electromagnetic or other familiar energies. This has caused the author to hypothesize a fundamental model of substance that leads to a variety of new forces and radiations capable of accounting for different psychoenergetic phenomena (24). It is postulated, following the yoga philosophies concerning the seven principles operating in man, that the human body is constituted of seven different types of substances that obey seven unique sets of natural laws and, based on the polarity principle, form atomic and other states of combination at each level of substance. From these different levels of substance, different types of radiations emanate. With this model we see in operation the metaphysical principle "as above, so below, as within, so without."

The seven substances, in an ascending scale of fineness and energy content, are the physical, the etheric (or the bioplasmic, as the Russians term it), the astral, the intuitive mind (M_1), the intellectual mind (M_2), the spiritual mind (M_3), and the spirit. There is probably nothing particularly important about this choice of names; it just happens to be that given in yogic philosophy. These substances are presumed to exist everywhere in nature and to interpenetrate within the human body—that is, they all exist within the energy construct of the physical atom and organize themselves in different macroscopic patterns within the body (but not in the same space-time frame as the physical). (As an analogy, think of seven transparent sheets containing seven different circuit patterns each in a different color. Put them together and you have the complete organization of the different levels of substance in the body.)

Although the different energy fields perturb each other normally in only a small way, they can be influenced to do so in a strong way by the agency of mind. It is presumed that waves of one type of mind field can be uniquely correlated so as to cause strong correlation, and thus energy transfer, with waves of a different level of substance. This means that a

coherent mental image—for example, one concerning a physical change in the body—creates a coherent potential distribution in the etheric dimension that manifests ultimately as a coherent change in the energy patterns of certain spatial locations of the etheric body. This serves as a coherent potential distribution applied to the physical level that eventually causes specific changes in the energy patterns and atomic reorganization of the physical level of substance. We see here a characteristic pattern of cause-and-effect steps that I shall call the *ratchet effect*.

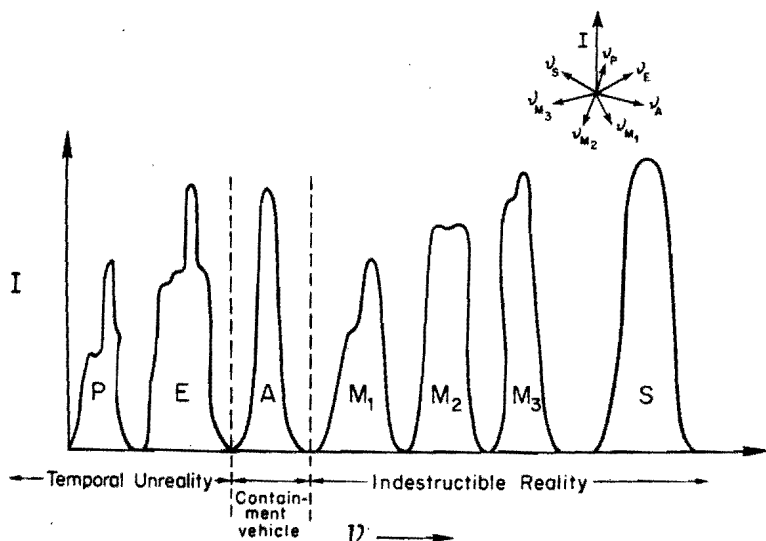


Figure 26. Schematic spectral distribution curve illustrating, along one coordinate, relative radiation characteristics of the seven postulated levels of substance.

This ratchet effect is a sequential mapping procedure (like mapping mathematical functions from the real to the complex plane and vice versa) via the following steps: (a) mind image generation to (b) etheric potential distribution to (c) reorganization of etheric substance to be in harmony with this potential distribution requiring time τ_E to (d) physical potential distribution changes during the reorganization of etheric substance so that a force exists for the reorganization of substance at that spatial location of the physical level. This reorganization on the physical level requires a time τ_P .

In Figure 26 a schematic diagram of possible spectral distribution curves (intensity versus frequency) is given for these different levels of substance. They should really be plotted on individual axes, as indicated

on the insert, since we are discussing different kinds of radiations for each level of substance (and there may be more than one major type of radiation from a given level of substance). However, for pedagogical purposes, there is value in having them represented on one axis. It is from this diagram that we may see the basic radiation components that comprise the human aura.

Here, the first two levels deal with the temporal reality of physical man, and the fundamental waves of substance are characterized by a space-time frame of reference. However, the space-time frame for the etheric level is complementary to, but different from, the space-time frame for the physical level with which Einstein's name is so strongly associated. The third level, which is the structure of emotion, is primarily a containment vehicle for the indestructible reality of continuing man and, as such, is an envelope for holding the upper four levels of substance of an entity together between incarnations. The wave functions of the mind and spirit levels of substance are characterized by a frame of reference dealing with potential coordinates rather than space-time coordinates. In fact, it is proposed that space and time are properties of the mind and spirit waves, just as mass and charge are properties of electromagnetic waves in the space-time frame.

In the case of the physical dimension, we have the positive space-time frame or the Einsteinian frame with which we are fairly familiar. The etheric dimension is the conjugate-physical dimension and can be described as a negative space-time frame. These two are complementary frames; that is, as time goes on, for the physical, the potential decreases and entropy increases, whereas for the etheric, we have the reverse situation (the potential increases and entropy decreases). A characteristic of the physical frame is one of disorder. A characteristic of the etheric frame is one of order or the organization of substance. The physical is primarily characterized by electric effects. The etheric is primarily characterized by magnetic effects. In the physical, the arrow of time is in what we define as the positive direction; in the etheric, the arrow of time is in the reverse, or negative, direction. In the physical, both mass and energy are positive and the maximum signal velocity is the velocity of light. In the conjugate physical, both mass and energy must be considered to be negative and the minimum signal velocity is the velocity of light. Thus, that energy corresponding to mass moving at the velocity of light is a singular point on the energy scale wherein energies diverge to $\pm \infty$ on either side of the singular point. Rather than acting as an impenetrable barrier for substance at energies on either side of this point, it probably behaves like other mathematical singularities appearing in our description of nature—that is, tunneling is possible from one side to the other. This leads one to speculate on whether we have here the explanation for the "black holes" in space. As a final spec-

ulation, since conventional physics neglects the existence of energies beyond the physical, and the interaction of fundamental particles with same, we may ask if this is why we are chained to the use of an "uncertainty principle" and a statistical mode of description.

These factors and others will have to be taken into account in the designing of future devices for sensing nonphysical energies.

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