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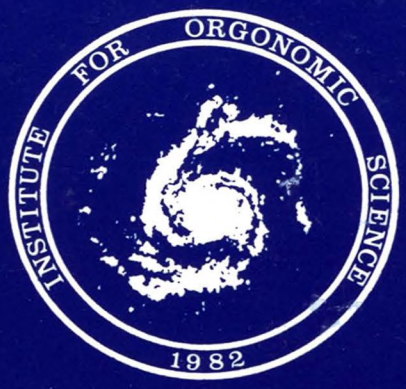

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SCIENTIFIC ARTICLES

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Energy: An Overview

COURTNEY F. BAKER, M.D.

Abstract:

Energy is normally defined in terms of mechanical work, and exists largely as a mathematical construct in classical formulations. However, its ultimate source lies not in matter but in the dynamic, spontaneously moving orgone energy continuum. This paper is a preliminary attempt to formulate a unifying concept of energy based on the centripetal flow of energy from the medium.

I. Introduction: Classical Formulation from Newton's Second Law

Everyone, from the theoretical physicist to the depressed housewife, has a working definition of energy. Yet these individuals are using widely different concepts, whose actual, rigorously defined links to each other's definitions involve chains of interactions which are as yet poorly understood. As we shall see, the real nature of energy is not at all apparent in classical definitions, as given below:

ENERGY.—The capability of doing work (1:3324).

WORK.—When a force acts against resistance to produce motion in a body the force is said to do work. Work is measured by the product of the force acting and the distance moved against the resistance (1:3269).

FORCE.—That which changes the state of rest or motion in matter, measured by the rate of change of momentum (1:3228).

This chain of definitions is rather characteristic of physics, in that very few, if any, abstract concepts stand alone. A certain circularity is obviously involved in the definitions, in that work requires force in its definition, while force in turn is defined by the motion of matter. The motion of matter implies the action of a force, which, acting through a distance, does work; mechanical work is the result of the expenditure of energy. However, all that can directly be observed or measured is mass, length, and time; as a result, forces, work, and energy are actually only implied (not directly measured) from changes in length, mass, and time.

There is, therefore, no "energy meter"; energy is a construct and not directly measured itself. In a sense, mechanical energy or mechanical work itself subserves the general function of an energy meter or energy reference point.

This situation exists, in part, for historical reasons, since forces acting on macro-

scopic bodies were defined and understood before the concept of energy, as a general entity, was discovered. Originally, force and energy were clearly defined only in relation to large moving masses. Later, heat was determined to be a form of energy, and a unit of heat energy, the calorie, was found to be related to a unit of mechanical energy by a conversion factor. Thus, a certain amount of heat energy could ultimately be measured in ergs, a unit of mechanical energy. This principle was extended to new energies as they were discovered, namely, electric, magnetic, electro-magnetic, and nuclear energies. All forms of energy can be rendered as an equivalent amount of mechanical energy, in units of ergs or joules.

All of this had its beginning with Newton's Second Law, first published in *Principia* in 1686:

> *Law II. The change of motion is proportional to the motive force impressed; and is made in the direction of the right line in which that force is impressed (2:13).*

This is a formal rendering of the famous Second Law, which became a major cornerstone of physics:

$$\text{force} = \text{mass} \times \text{acceleration} = m \cdot A$$

Since work is the product of force and distance, then:

$$\text{work} = \text{force} \times \text{distance} = m \cdot A \cdot d = \text{Energy}.$$

Herein lies the root of the modern definition of energy: that entity which can do, or give rise to, mechanical work; work in turn occurs when matter is accelerated through a distance, in the same direction as the impressed force. Energy, therefore, is essentially defined by the acceleration of matter. This definition tells us nothing about the nature of energy, its sources, or how it may act to cause matter to move.

Energy, in modern terminology, is a scalar—that is, an entity characterized only by its magnitude. Energy is, therefore, measured only in terms of how much there is; no definition gives any clue as to how it may give rise to directed motion. The latter is the province of forces.

Forces actually lie closer to the heart of modern concepts of physics. Four qualitatively different forces are recognized: gravity, the electromagnetic force, and the weak and strong nuclear forces. Forces produce observable motion, and are therefore readily grasped and appreciated. Anyone can observe moving billiard balls interacting, magnets pulling on iron filings, or an electrostatically charged comb affecting small bits of paper. However, the energy involved in these events is abstract and somewhat obscure. It took some time even for physicists to recognize both that heat was energy and that heat and mechanical energy were interconvertible in a rigorous way. Classically, there is only one energy, in that energy is characterized only by magnitude; X calories of heat energy translate into Y ergs of mechanical energy. Energy is thus deprived of any qualitative features and remains mostly as an abstract, mathematical, "bookkeeping" device. Nevertheless, the physical process in this interconversion process is very real (although not at all obvious). Everyone can grasp the chain of events in the conversion of the chemical energy of gasoline to heat energy, and then to mechanical energy which moves the car; the physicists' equations balance, and yet that entity "energy" which is transmitted through the chain does so in ways that are only superficially understood. It should be emphasized here, of course, that despite its abstract treat-

ment by physicists, energy is a real "something" and not just a mathematically useful calculation which helps to balance the equations.

It is apparent from the foregoing that forces are the immediate cause of motion in the universe. From where do they arise? In the modern formulation, all four basic forces are inherently tied to matter. Gravity, and gravitational forces, appear simultaneously with mass; electromagnetic forces arise from charged mass (charge never being observed unattached to mass), and the nuclear forces from nuclear particles. This formulation, of course, explains nothing. It amounts to little more than a description of association, i.e., which forces are found in what circumstances. To make matters worse, these forces, when acting at a distance, do so through empty space (the vacuum) via a "mechanism" of particles, some of which have never even been observed ("graviton"). Even this description has apparently become unworkably abstract for modern physicists, who have been forced to modify "space," endowing it with characteristics, including a basic level of energy ("the zero energy" or "vacuum state"). In a sense, this process of emptying space and mathematizing physics has left forces almost as abstract as energy itself.

We may summarize as follows:

(1) Energy and forces are inherently created as an automatic byproduct of mass formation.

(2) The fields and forces associated with mass interact and cause motion; energetic changes are secondary consequences.

(3) Energy and forces are inextricably tied together via the mechanical definition of energy, which derives from Newton's Second Law.

While Newton's equations have served physics well for several centuries, they remain largely rules of interaction, with little elucidation of the underlying dynamics involved in the acceleration of mass. The basic equation, $F = m \cdot A$, is idealized as rigid, point masses being acted upon by external forces which somehow transfer energy to the "acted upon" mass. Consider the following:

(1) Real mass is not rigid during acceleration.

(2) Real mass is not a point, but has a finite extension.

(3) The location of the energy associated with moving mass is obscure; in water waves, for example, the water molecules mostly undulate up and down, while the energy moves forward. The term "kinetic energy" does not clarify in any way exactly what it is that flows forward from molecule to molecule.

(4) Newton's law predicts infinite acceleration for zero mass, and hence infinite energy. The law breaks down for mass-less accelerations.

(5) In Newton's law, external force is set equal to mass times acceleration. This equation involves a subtle, rarely perceived confusion between "external force" and "$m \cdot A$."

The latter point requires further discussion. In the usual scheme, an "external force," which we will call the "motivator," acts upon a mass, causing it to accelerate. The "force" is given as $m \cdot A$. The formula equates one kind of entity, the motivator, with the reaction of the mass, $m \cdot A$. Clearly they are different things. In fact, Newton's Second Law is actually an

identity, in that force *is* accelerated mass; the equation only tells us how the mass resists motion, and tells us nothing about the motivator itself. "Force" by this equation is an inertial property of matter alone.

To see this more clearly, consider the case of a charged mass. Let this charge (q) on the mass be acted upon by an electric field (E). The "electric force" is given by

$$\text{Force (electric)} = q \cdot E$$

and this is set equal to the inertial force $m \cdot A$ so that

$$\text{Force} = q \cdot E = m \cdot A.$$

There are clearly two processes going on here, qualitatively different. First, there is the reaction of the charge to the electric field; second, there is the resistance to motion by the mass. The "charge" is acted upon by the field, and the mass dragged along, since the mass and charge are attached. Thus, we actually know nothing about the charge/field interaction, i.e., how pure "charge" in an unattached, mass-free state would react to an electric field. All this equation tells us is how much equivalent electrical energy must be expended to overcome the inertial properties of the mass; in other words, the inertial properties dominate the interaction. For example, the equation predicts that a mass-less charge acted upon by an electric field would experience infinite acceleration; this is clearly un-physical.

Energy is, therefore, defined and measured via the inherent motion-resisting property of mass. A lack of motion (or uniform motion in a straight line) is taken as the normal "zero" point of reference. This framework causes interesting problems in calculating the energy of steadily (nonaccelerated) moving bodies, or calculating the potential energy of a body at rest but above the earth's surface, since the energy depends on a reference point, and the location of the energy is mysterious. For example, the value of the kinetic energy of a body moving in space is entirely arbitrary, since velocity (which determines its energy) must be calculated relative to some arbitrary reference point. From the inertial standpoint, any movement must be explained, and have a cause; further, any new movement requires the expenditure or transmission of energy.

This formulation, then, which places the source of energy with mass, involves a paradox. Mass is the postulated source of forces and energy, yet any new motion generally comes from outside any given mass: forces act upon mass, which is the passive recipient of action, as well as the active resistor of motion. Mass is not self-motivating. It is clear that we must look elsewhere for the source of energy.

II. Source of Energy: The Medium-Centered Approach

In the mass-particle approach of modern physics, energy and forces ultimately derive from matter; although a mass may receive energy from the outside, its source lies in other masses. This process is invoked on a huge scale, when necessary, as for example to explain galactic development, or the existence of "superclusters." The theory asserts a centrifugal direction of action: mass exerting its influence outward from the center into space, acting at a distance. Even when "fields" are described, their existence is essentially a mathematical model and not to be taken literally.

A major problem with this approach is a resulting vagueness about dynamics. Saying that a gravitational field issues from mass does nothing to further thinking about how this occurs, or the nature of the

"field" itself. As a result, physics is forced to accept such meaningless concepts as "curved space," "action at a distance," and the theoretical existence of "graviton" particles.

A space-filling medium which is a source of energy dramatically alters this picture, and opens the way toward much wider conceptual possibilities. Even when the "ether" could not be experimentally demonstrated, its assumed existence was extremely useful to theorists struggling to understand the distant field effects of electric and magnetic phenomena.

The medium-centered approach to energy can be summarized by stating that *the energy of mass-systems both flows into them, and derives from, the ambient medium.* The direction of energy flow is centripetal, that is, toward and into mass, rather than issuing from it. This places mass in a secondary role: mass is acted upon.

This view of nature is, of course, Reich's perspective, ranging from his observations of the charging of bions to the concept of galactic formation by superimposition. It is not the intention here to review in detail well-known orgonotic processes (such as superimposition, or the flow from low to high), but to develop a wider concept of energy, embracing "secondary energies" as well. As we have seen, from a scalar or magnitude standpoint, there is only one energy; however, the great task of physics is to demonstrate the developmental and sequential processes by which a single primordial "energy" becomes transformed into the various known forms of energy. In the present context, the intention is simply to show how a medium-centered approach can begin to unite all energies into a wider common framework. This process helps toward developing a real understanding of the essential nature of energy.

Our survey begins at the cosmic scale of events and works progressively downward in dimension. In the conventional view, the summation of the minute gravitational forces of countless particles pulls them together into larger units of stars and galaxies. In turn, large-scale galactic motions and the existence of "superclusters" are also presumed due to gravitational forces. This has led to severe difficulties, such as where the observed mass necessary to explain the effect falls short, sometimes by as much as an order of magnitude.

Reich's formulation was clear and concise. Galaxies form from the energetic superimposition of two or more flowing streams of pure energy, which revolve around and merge toward each other. In the process, mass is formed and carried along in the general rotating and spiraling motion. This description is consistent with the now-accepted "winding-up" motion of the spiral arms and increasing mass-density toward the center of galaxies. Furthermore, the primary role of energy as a direct source of motion, as well as the source of "gravity," removes any problems of unexplained "attraction" or missing mass. An additional point concerns the degree of structure observed; this feature has been troublesome for astrophysicists but finds a natural explanation in the wider recognition of energy as a source of new structure as well as pure motion.

In Reich's formulation, mass itself forms out of superimposing energy streams on the microscopic level much as the galaxy forms on a much larger scale. Thus, mass itself derives its properties and existence from a centripetal flow of energy from the medium.

A consequence of the mass-formation process is "mass-gravity." The gravitational forces holding the planets in orbit

around the sun is clearly different from galactic "gravity" (deriving from moving energy streams) inasmuch as it appears to be more clearly mass related. After all, satellites are placed in stable orbits using mass-related Newtonian formulas, without regard to any knowledge of orgone energy functions. This does not mean, however, that mass is the source of gravity in the sense commonly described in text books, i.e., "action at a distance." Newton himself did not believe it, although this was not apparent from *Principia,* which was a rigorous mathematical treatise, and did not discuss the ether, which could not then be demonstrated. However, in his private letters, he openly stated his view of gravitational attraction as due to the "luminiferous ether." As one editor of *Principia* states:

> *It was easy, therefore, to jump to the inference that in the Newtonian theory, gravity was an innate, inherent property of matter . . . While readers of the first edition of the* Principia *had some justification in attributing to Newton the view that gravity was an innate property of matter, they were nevertheless mistaken . . . in a letter to Robert Boyle, he speculated on the "cause of gravity" and endeavored to explain attraction by the action of an "aether" . . . (2:633)*

In one of these letters, Newton himself stated:

> *It is inconceivable, that inanimate, brute matter, should, without the mediation of something else, which is not material, operate upon and effect other matter without mutual contact . . . (2:634)*

And finally, another editorial comment by Maxwell:

> *We find in his 'Optical Queries' and in his letters to Boyle, that Newton had very early made the attempt to account for gravitation by means of the pressure of a medium . . . (2:636)*

Newton's use of the word "attraction" in his analysis of gravity was merely descriptive, but was misinterpreted to have dynamic significance. He meant only that the gravitating bodies approached each other, not that they caused the approach.

However, the Newtonian formula works, and does so by calculating the force between the centers of mass of gravitating bodies. This has been interpreted to mean that the force emanates from the center of mass. In fact, all that the calculations really imply is that the gravitational force acts along the line joining the centers of mass. It is critical to recognize, in the present context, that this purely mathematical rendering is entirely consistent with a gravitational force that acts to push two gravitating bodies together along the line between centers, rather than pull them together, as is usually assumed. This new formulation bears most heavily on the possible dynamics of "gravitational attraction": what is now being suggested is that the surrounding medium pushes the two bodies together. This approach has the added virtue of being conceptually similar to electrical interactions, as we shall see shortly.

A supporting piece of evidence for this hypothesis comes, ironically, from the bending of starlight by the Sun, a phenomenon usually cited to support general relativity. In fact, the starlight is bent in a direction toward the Sun; from optical theory, this implies that the light is entering a medium of increased index of refraction (slower speed of light). Since all matter has an index of refraction greater than that of free space, the observation suggests that the gravitational field near the Sun has some "matter-like" properties. A possible mechanism of gravity is thus suggested: the

mass of a gravitating body causes changes in the surrounding medium, such that the "medium pressure" is reduced between two masses; *the masses are then pushed together by the higher pressure on the outside.* Accordingly, "mass-gravity" is a result of the interaction between mass and the surrounding medium.

The current theories of solar energy also do not escape unscathed from a close look at the evidence. One reads references to the nuclear fusion process fueling the Sun (particularly now in regard to fusion-energy research) so often and so matter-of-factly that it comes as something of a shock to discover that this concept is poorly, if at all, supported by observation. Ralph Juergens, in considering the role of plasma in interplanetary space and its role in celestial dynamics, writes as follows:

> *I can find no way to state this diplomatically, so let me be blunt: The modern astrophysical concept that ascribes the Sun's energy to thermonuclear reactions deep in the solar interior is contradicted by nearly every observable aspect of the Sun.*
>
> *It seems astonishing that in the course of half a century of studies of the Sun in context with thermonuclear theory, very few professional astrophysicists have ever expressed the slightest discomfort over discrepancies between observation and theory, or even over the fact that an ad hoc extra theory has had to be devised to explain practically every individual feature of the solar atmosphere. (3:145-6)*

Juergens believes that the Sun behaves as a giant electrode, drawing in charged particles from space, fueling it from the outside. He feels this theory is more in harmony with the observed features, such as the reverse temperature gradient (the corona is far hotter than the surface), origin and constancy of the solar wind, bloated atmosphere, and several other phenomena. This is not to say that nuclear reactions cannot occur within the Sun, only that the Sun's major source of energy comes from the environment.

It is not unreasonable to suppose that similar, though less intense, mechanisms are taking place in the Earth as well. After all, the Earth has a hot "corona" (thermosphere), a conspicuous blue ring of concentrated energy on the surface, high electrostatic charge, and a source of internal heat which has heretofore been explained via radioactive decay in the interior. Quite possibly the internal heat of the Earth is simply a planet-sized example of the To-T heating effect resulting from concentrated orgone energy, as observed in the accumulator.

It has also recently come to light that Jupiter whose internal temperatures are far too to low to ignite thermonuclear reactions, nevertheless manages to radiate approximately twice as much energy as it receives from the Sun (4). The source of this energy is unknown.

We will turn our attention now to the realm of electric and magnetic effects. This is one area where the experimenter can get an immediate tactile feel for the medium distortions caused by electric charge (such as simple electrostatic attraction experiments, or the three-dimensional quality of a magnetic field pulling on a piece of iron). Historically, many physicists attributed these effects to "strains" in an ether medium. Today, we are left with the empty "unlike charges attract" explanation for both electric charge and magnetic poles. Even so, modern physics textbooks are careful to point out that the energy of a capacitor is stored between the plates in the dielectric material, and that the energy of

an inductor is stored in the surrounding magnetic field, and not in the wire itself. However, the equations and concepts currently in use do not make any further reference to a medium.

Several decades ago, however, Fernando Sanford did develop a working concept of electric effects based on medium strains, during the course of many years of measurements of Earth electrification. According to Sanford, electromotive forces are manifestations of a strained ether medium reacting automatically to minimize the disturbing effects of charged particles (5:51). In particular, he felt that:

(1) The region around an electron is an area of ether strain.

(2) The region around a proton is a region of reduced ether elasticity (5:63).

"Elasticity" refers to the property of a substance such that, when deformed by a force, it returns to its previous state after the deforming force is removed. In the case of electric charges, it was clear to Sanford that electrical forces were simply the manifestations of the ether, responding to strain caused by charged particles. *"It is a characteristic of elastic bodies that they react to any strain in such a manner as to distribute the strain as uniformly as possible throughout the whole body."* (5:51) Accordingly, the strain would force the distribution of the charged particles to change, reducing the strain, until no further motion was possible. In particular, this process would tend to push electrons into the region of protons, since the reduced elasticity near the proton would automatically reduce the strain. Thus, charged bodies do not "attract" or "repel" each other at all; their charge disturbs the medium (indeed, this is how we recognize the phenomena of "charge"), and the medium reacts, automatically, to reduce strain.

As elementary as these concepts might be, they are obviously much more valuable in understanding the dynamics of electromagnetic effects than meaningless phrases such as "unlike charges attract."

Sanford's work led him, like others before him, to believe that the Earth and Sun were highly electrified bodies. Such a high degree of charge has an interesting consequence, as Sanford points out. It is well known from classical electrical experiments that a rotating charged sphere develops a magnetic field, and Sanford supposed that this was the mechanism that generated the terrestrial and solar magnetic fields (5:83). Note, again, that this concept runs directly contrary to the modern view, which places the source of terrestrial magnetism deep within the Earth, somehow generated from slowly moving currents deep within the core.

Of great theoretical interest is the fact that in both the electrical and gravitational "ether pressure" explanations of "force," the strain which gives rise to the force would naturally be reduced as the square of the distance, as the strain would be spreading out over the surface of an expanding sphere. This is in perfect harmony with the well-known "inverse-square" behavior of both electrical and gravitational fields.

Much less can be said in this context about the nuclear force. Reich's experience with the oranur effect did demonstrate, however, that the nucleus could be permanently altered by exposure to concentrated orgone energy. This experiment does suggest that the nucleus is far more reactive to its environment than is normally thought.

None of the foregoing should be taken as a definitive attempt to prove that the medium is the source for all secondary

energies. What has been suggested is that quite plausible theories, often in better harmony with the facts, have been developed by a number of physicists which place the source of energy in the medium. These theories have the virtue of providing a clearly visualizable mechanism by which various forces exert their effects, rather than empty phrases like "action at a distance" or "unlike poles attract." Sanford characterized the situation very clearly as follows:

> *We seem to be forced to one of two hypotheses for the explanation of electric attraction and repulsion: either these forces are due to what is known as action at a distance, or they are due to stresses in an elastic medium. If we adopt the former hypothesis we give up our problem at this point. "Action at a distance" is forever incapable of scientific explanation, and to refer a physical phenomenon to action at a distance is to conclude that it is incapable of further scientific investigation. (5:30)*

III. Medium Properties

It is clear that the medium-centered approach to energy reverses the usual perspective regarding the source of energy, forces, and structure. Now energy, not mass, is viewed as primary; mass itself forms out of the medium. However, once mass has formed, with its given properties, it then interacts with the surrounding medium. In fact, one might ask whether all the "given properties" of mass are not simply various manifestations of the mass-medium interactions (i.e., where does mass get its properties from in the first place, if not the medium?). In any case, the resulting forces are a result of the mutual interaction between the disturbing effects that mass has on the medium (such as electrical strain), and the medium's reaction to the effect. The medium, however, is still the primary source of motion, i.e., "electrical strain" would mean nothing if there were not a medium capable of being strained.

A very general definition of energy is *that entity which ultimately gives rise to movement.* This definition does not involve mechanical forces or depend on the motion-resistant properties of mass. At the same time, it does not exclude the use of mechanical work as a means of measuring energy. The virtue of the definition is that it gets at the fundamental essence of energy (i.e., movement), while it is broad enough to include both mass-free and mass-related forms of motion.

In the presently accepted "big-bang" theory of creation, all movement arises from (1) the explosive/expansive action of the "big-bang" itself, and (2) the resulting forces derived from the created matter, which give rise to motions among the bodies created in the explosion. In this theory, all motion is "given" at the beginning, with the universe consequently "running down" continuously to an eventual state of motionless "heat death."

Reich recognized that spontaneous motion was one of the most basic characteristics of the orgone energy medium. This places the source of present-day motion with present-day phenomena, i.e., *"new" motion is continuously being generated.* However, this observation poses several conceptual difficulties. First, the medium both gives rise to impulses and is at the same time the substrate for their transmission. In addition, the movement generated appears to consist both of waves and impulses of energy, the latter consisting of bundles of condensed medium, shown, for example, by electroscope charging from Vacor tube impulses. This is evidence for a certain amount of "stuff" (charge) being deposited on the electroscope. Now the

problem is that, since the impulses arise spontaneously, and can give rise to the motion of matter (To-T, electroscope leaf movement), which is clearly a manifestation of energy, the orgone appears to violate the law of conservation of energy. In fact, an *infinite* amount of "free" energy appears to be available.

We must recognize that the mass-free impulses arising in the orgone do not constitute energy in the same sense that it has been defined. Energy, in the classical definition, does not exist (in the sense that it cannot be measured) until the impulse or momentum is transferred to matter, either directly or indirectly. It is further apparent that a large proportion of the spontaneous OR motion is not transferred to matter in the usual course of events. This is certainly true for To-T and the bioelectric experiments, where relatively large concentrations of orgone energy give rise to relatively small mechanical energy units (measured in tenths of a degree centrigrade for To-T and millivolts for the bioelectric potential 6:71). Most of the impulses evidently flow right through our electrically activated instruments, thermometers, etc., without registering. This raises the practical and theoretical question of exactly how the orgone impulses do get transferred to matter.

The properties of the orgone as a medium are therefore critical to an understanding of the essential nature of energy:

(1) *The orgone medium is a self-attractive true continuum.*
This is, almost by definition, what is meant by "orgonotic" forces, i.e., the processes that give rise to the flow from low to high concentration. It is also an essential feature of any medium that is truly a continuum: a true continuum is cohesive; this requires that the various "parcels" of energy attract and adhere to each other.

(2) *The medium is expansive.*
This is the countervailing tendency to the attractive or centripetal function, which gives rise to contraction. Together the two tendencies allow for pulsation.

(3) *The medium constitutes a certain amount of "stuff."*
This is inherent in Reich's use of the term "orgone energy concentration." It is also evident from various observations, such as electroscope charging; the "stuff" of matter, which derives from the orgone; and from the finite velocity of light. The orgone energy continuum is not infinitely thin, but has a certain finite "density" property.

(4) *The medium is the source of spontaneous motion.*
This motion consists of discrete impulses of orgone, spinning waves, streams of energy and pulsation: both structured and random motions that derive from, and exist in, the cosmic orgone energy ocean.

(5) *The medium supports and creates structure.*
This function is as important as spontaneous motion; many forms of OR movement are highly structured and cohesive. This motion may carry matter along with it, in which the material structure represents "frozen" motion. The structure and development of living organisms (such as the orgonome form) are perhaps the best example.

(6) *The medium is "elastic."*
This quality is inherent in the ability of the ether to support transverse wave motion, electromagnetic radiation, electric oscillations, and storage of energy in "fields." It is a central feature in the theory of "ether strains."

(7) *The medium can sustain tremendous "strains."*

Sanford's work measuring atmospheric electrical effects led him (like others before him) to conclude that the Earth was highly charged electrostatically, on the order of 10^{16} volts (5:79). This enormous potential is not normally perceived or measured directly, since only differences in potential manifest themselves.

(8) *The medium has an enormous information-carrying capacity.*
Some idea of this potential can be appreciated by considering that literally millions of radio signals can pass through the same space at the same time (or be manifested in the same antenna) without interfering with each other.

(9) *Space and the medium are different.*
This difference is perhaps one of the most tangled conceptual problems in modern cosmology. A hundred years ago, the thinking was clearer; many physicists thought of a space-filling ether medium for electro-magnetic phenomena. With the acceptance of special relativity, the ether was regarded as "superfluous," and space itself began to be given characteristics, including curvature. In fact, many felt that space was the ether.

At best, this confusion between space and the ether medium is sloppy thinking; at worst, a subtle attempt to resurrect the ether without directly acknowledging it. It is essential to maintain clearly the space/ether distinction, because otherwise the physical reality of forces and energy is lost in an intangible abstraction.

Space is an abstraction, an attempt to define the three-dimensional extension in which things exist and events take place. It is, further, a reference frame for observing physical events such as forces and fields. For example, the bending action of a gravitational field on light is noticeable because light normally travels in a "straight" line, i.e., the normal "flat" space is the reference. However, the relativistic point of view claims that the curved light ray is still following the normal reference of space; only now, space itself is curved. This approach mis-identifies an effect (bending) with the metric (space) used to measure the bending. The normal "straight" aspect of space is an abstract ruler with which we can determine the fact that the curved light path exists in the first place. To identify the gravitational force as having curved space essentially renders the idea of forces meaningless except in the abstract sense.

In the normal course of events, we measure changes in trajectory (geometry), and from this deduce the action of a force; the changes in length are evidence by which we become aware of the force. In the relativistic viewpoint, we no longer have physical forces at all; we only have trajectories with no intervening principle that might "cause" the effect. In effect, the relativistic "bending of space" is actually only a more sophisticated form of "action at a distance," i.e., mass here, and effect there, with no intervening connection.

Furthermore, no degree of bending of space can give it the attribute of time, the latter being essential to any observation of motion. Thus, clever manipulations of space to escape the reality of medium-transmitted forces still do not remove the problem of the existence of effects in time. Time, of course, is of central importance in the definition of energy.

Finally, from practical and theoretical points of view, space itself cannot be either measured or appreciated except through the projection of energy through it. It is, in fact, the time of energy transit through space which allows us to confirm that a certain extent must exist (i.e., a "space" traversed at a finite velocity). Space has no

meaning at all for an energy pulse that can travel at infinite velocity. Thus, as we will see, limits on motion form an essential feature of the definition and appreciation of both space and energy.

(10) *The medium is a reference for motion.* If the kinetic energy of a moving body is real, and not just a mathematical construct, then its true calculation cannot be based on an arbitrary reference point. Motion relative to space is not meaningful, but motion relative to the medium is not only meaningful but energetically significant.

IV. Energy and Matter: Energy as a Limitation of Motion.

The recognition of light as a disturbance in a medium and the existence of a finite velocity (c) for that disturbance, imply a limit on motion, deriving from the medium itself. In fact, forces and fields that could project at infinite velocity would lose meaning as forces in the usual sense, since cause and effect would be lost. (There would be no cause followed by an effect, but only simultaneous events.)

It is, in fact, via restrictions on motion that we are normally aware of the existence of orgone energy at all. The action of the energy is observed secondarily via its effect on matter (such as galactic structure, biological form, To-T, etc.). This is true also for the visualization of orgone energy, which requires interaction with light (secondary energy) or photographic emulsion to become manifest. Those orgone energy impulses that do not interact with our instruments are never observed or recorded, and therefore do not register as energy.

Our measurement and appreciation of "energy," therefore, is a measure of the residue of spontaneous motion that has become transferred to matter or secondary energy in some form. Measurable energy can therefore be thought of as spontaneous motion that has been transformed by a limitation in its movement. In fact, the centripetal, or central-moving tendency is itself naturally limiting, in the sense that motion towards a point, or around a point (circular motion), necessarily involves a limitation of movement (since fewer kinds of movement are now possible).

We infer the existence of unmeasured energy from discrepancies in our observations. For example, the minute bioelectrical potentials that accompany great emotional changes in an individual suggest that our apparatus is registering only a fraction of the actual energy at work.

What we measure as energy, therefore, is the result of the "capture" of some medium motion by matter. This is clearly the case for To-T, where freely moving orgone transmits some of its "impulse" to air molecules. However, the question remains: Where is this "captured" impulse, registering as energy, stored? It is true that the heating effect (To-T) represents faster-moving molecules, but velocity itself is not energy (kinetic energy is given as $1/2\ m \cdot v^2$). It is, in fact, the combination of mass and velocity that stores the kinetic energy; from the foregoing considerations, this energy can only be stored in the mass-medium interaction.

A second example is helpful here. Consider the process of raising a mass to a height: this is considered to increase the "potential energy" of the mass by $m \cdot g \cdot h$. Now it is true that this amount of energy can be withdrawn from the mass by letting it fall, converting its "potential" energy into either useful kinetic energy (water turning a wheel) or heat (random kinetic energy). It is not true, however, that we have "increased its potential energy" by raising it to a height, as physics texts assert.

In fact, the potential energy was there all the time, located in the medium, in the form of the gravitational interaction between the mass and the earth. All we have done in raising the mass is to give the existing possibility for motion a longer distance over which it can exert its influence. Of course, we have to do work to raise the mass; we are erroneously led to believe that we store this energy as potential energy and then get it back when the mass falls. However, the mass does not store the energy we expended to raise it, since it is at rest at its height, any more than we "store" energy in a canoe by paddling it upstream against a current. The energy is present in the medium: this energy expresses itself when the object (mass, canoe) is free to move with the "current," which is the source of the motion.

In the case of electromagnetic and gravitational effects, we considered that the "forces" were expressions of imbalance of pressure or strain in the medium. This implies, of course, an ongoing, continuous interaction between mass and the medium. While this concept might be obvious in the case of electric and magnetic effects ("ether strain"), it might not be as obvious that inertia, the property of matter that resists motion, is also the active product of such an interaction. We are so used to the immobility of mass as a natural attribute that normally we do not consider the possibility that its resistance to motion is, in fact, the main manifestation of matter's continuous medium interaction. If this concept of inertia is valid, it suggests that "kinetic energy" is stored in the medium, as a strain or resistance that increases when matter is accelerated and forced to move through the medium. A moving bit of matter might then carry with it a surrounding strain analogous to the electric strain around a charge; it is this strain that stores the kinetic energy, which can then be recovered when the mass decelerates.

The foregoing analysis should not be taken to mean that the energy stored in "straining" the medium is a static quantity. In fact, it is quite likely that the straining process is one of active or even increased movement; the terminology "strain" is used simply to convey the idea of a sustained disturbance of some kind in the medium.

We are now in a position to address the question of infinite "free energy" from the medium. From the simple concept of energy "capture" or storage by matter, it might suggest that the free motion of the orgone is only temporarily altered or constrained in this process, and that in addition, a certain amount of medium-motion does get withdrawn from the medium in the process of energy withdrawal. Most likely all of this energy can be returned to the medium at some later date by a variety of processes. Thus, the amount of energy available only appears to be infinite, because of the enormous reservoir of motion present in the medium.

V. Summary

An attempt has been made to demonstrate that, contrary to modern physical concepts, the source of energy in nature lies not in mass but in the surrounding orgone energy continuum. This is as true for "secondary energies," such as kinetic or potential energy and electromagnetic effects, as it is for the orgone itself. Mass functions largely as the passive recipient of impulses from the medium, rather than the primary initiator of motion. The location of energy "storage" in kinetic and potential energy is posited to occur in the mass-medium interactions. Thus, energy of any kind has a real physical "location" and

mechanism, and is not simply a "book-keeping" device.

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An Air Germ Experiment

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Abstract

An experimental protocol to determine the presence of airborne protozoal cysts is presented. The premise of the study is that, if the protozoa found in grass infusions are due to these cysts, then culture media proven to support the growth and reproduction of the same organisms should yield these forms simply on exposure to the air, without the addition of grass clippings. Two years of accumulated data and observation show that the protozoa of the grass infusions do not appear in the artificial media, thus contradicting the assertion of the air germ theory. Furthermore, the study confirms Reich's work on the organization of protozoa from bion vesicles. A new finding—the formation of various amoebae from heaps of bacterial cells—is described, and its pertinence to other experiments by Reich is discussed.

Introduction

The traditional biological concept of biogenesis is that all present life derives from preexisting life, which came into existence by unknown means billions of years ago. The protozoa which develop in a grass infusion are, therefore, considered to be the result of the germination of spores or encysted forms of these micro-organisms. That is, these cysts are borne on the air and settle on the grass; placing the grass in water presumably reactivates them through a process of hydration. In this instance, the role of the grass is merely incidental: It carries the germs on its surface and, as it decays in the infusion, supports the growth of bacteria and other saprophytes on which the germinating protozoa thrive.

Reich, on the other hand, believed that biogenesis is an ongoing process, that new life is continuously generated when and where conditions are favorable, and that the life process itself is a spontaneous function of the orgone energy. In the case of the grass infusions, he observed that certain forms of ciliata and amoebae appear to form in heaps of bion vesicles that derive from the death and disintegration of the grass tissue. Protozoal development in these infusions is thus an example of biogenesis in decaying organic matter by a process of reorganization.

Reich began his observations of grass infusions in 1936 to ascertain the generality of the orgasm formula in biological functioning and to observe its manifestations in the life activity of protozoa. His interest in observing the protoplasmic (plasmatic) streamings of the protozoa as reported by Hartmann and Rhumbler was prompted by his clinical experiences with the preorgastic streaming sensations elicited in his patients. After initial random and uncontrolled examinations of the protozoa in the infusions, he verified the findings of Hartmann and Rhumbler and was satisfied that the tension-charge process and streamings were vividly represented in the activities of the organisms. The leap which he made at this point was to shift his attention from the organisms, and to study instead what was happening to the plant material itself. He shared Kraus's view that the living functions of biological colloids stemmed

from their reversible absorption of fluid, i.e., hydration with subsequent increased turgor or mechanical tension, with associated bioelectric charging. He sought, therefore, to observe the changes taking place at the margins of the grass fibers where, he reasoned, the effects of the swelling with fluid could most readily be seen. As a consequence, he was able to follow the vesicular breakdown of the plant tissue and the subsequent organization of heaps of vesicles into protozoa, i.e., biogenesis. Thus, in a very direct way, the stages by which the tension-charge process generated the life function from dead and dying organic material was revealed. To document this process from start to finish, Reich prepared a special setup which incorporated time-lapse photomicrography.

The Experimental Premise

It was our original intention to repeat Reich's work documenting the organization of the protozoa; however, in April of 1985, with a photomicroscope not yet available, it was decided instead to set up a simple experiment to test for the presence of airborne protozoal cysts. Reich describes a number of ways of doing this, including the examination of grass washings for cysts and active protozoa (1:44; 66-67). He also alludes to efforts to culture amoebae from the air "on various media," with negative results (1:205). Following Reich's lead, our plan was to expose suitable media to the air. Since he did not specify exactly what the "various" media were, we wondered if Reich had used the usual broths and agars employed in culturing bacteria. This is an important question, because protozoa will neither grow nor survive in these kinds of preparations. With Kudo's textbook on the protozoa as a guide (2:882-884), we selected two culture media to ensure success with a wide range of species. As a safeguard—to prove the suitability of the media—one group of culture jars was to be purposely seeded with protozoa from grass infusions and other naturally occurring habitats. A second group was simply to be exposed to the open air in a grassy field. The experimental premise was that if the air germ theory is correct, culture media proven to support the growth and reproduction of protozoa from grass infusions and other sources should yield these same forms merely by exposing the media to the air, i.e., without the addition of grass clippings. As Reich puts it:

> *...If the advocates of the air germ theory wish to continue to adhere to it, they will have to take the pains of demonstrating experimentally that the germs from which the protozoa allegedly grow can be isolated from the matter to which they adhere and can be made to develop into protozoa. (1:67)*

The Grass Infusion

It is essential to review the course of events in the grass infusion if we are to comprehend the results of our experiment with the artificial media; it is additionally valuable to study Reich's findings and conclusions, in contrast to those of conventional biology.

We begin by obtaining grass cuttings from the same lawn where we intend to expose our artificial media to the air. A few dozen half-inch pieces are washed thoroughly in a tea strainer to remove any traces of earth. They are further rinsed with distilled water and submerged in a finger bowl containing 200 cc of distilled water. We realize that this preparation is not sterile, nor is it necessarily free of protozoal cysts. A small fragment of the fresh grass

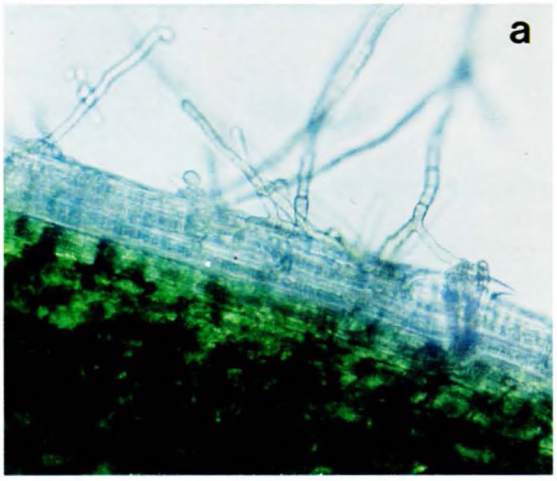
Fig. 1. (next page) Some representative organisms from the grass infusion and fishpond.

a) A section of a grass fragment from an infusion three days old. Mold mycelia have begun to grow from its surface. 640x.
b) A primal vesicle (arrow 1) rising out of a mass of disintegrating grass; the internal bions are vibrating so rapidly that they are blurred in the photograph. Arrow 2 shows a "finished" amoeba at the edge of the mass. 1600x. Nomarski Differential Interference Contrast.
c) A flagellate organism most closely resembling Chlamydomonas globosa. *Grass infusion at five days. 640 x.*
d) A ciliate, Spathidiodes sulcata, *is seen at the upper left. In the mass of bionous material at the lower right is a dividing colpoda. Grass infusion at 8 days. 640x.*
e) A ciliate, most likely Colpoda maupasi, *from the same sample as (d). 640 x.*
f) A ciliate, possibly Cohnilembus fusiformis, *from the same sample as (e). 640x.*
g) Amoeba striatum *from the same infusion at 15 days. 640x. Nomarkski DIC.*
h) Euglypha acanthophora, *a testacean amoeba, from the same infusion as (g). Note the long, slender filopodia and rigid shell which characterize this type. 640x.*
i) A large amoeba, most likely A. gorgonia, *encountered in the fishpond water. Amoeba of this type have survived for over two years after transplantation to an artificial culture medium. 640x.*

is immediately examined under the microscope to familiarize ourselves with its color and structure. At the same time, we observe its surface and the surrounding fluid for the presence of cysts or active protozoa. Except for an occasional floating vesicle (1-2μ), torn grass cell, or bacterium, nothing is seen. The finger bowl is covered with a pane of glass and allowed to stand for a few days. During this period, the fluid becomes slightly cloudy, and there is gross evidence of mold on some of the grass blades. Microscopically, we now find the preparation teeming with bacteria. The grass, still mostly green and essentially intact, has mold mycelia growing off its surface (Fig. 1). As yet, no protozoa or cysts are seen.

In the usual situation, after about five days, while they are not quite fully decolorized, the cuttings in the finger bowl have acquired a thin, wispy, mucus-like covering. Under the microscope, this is most clearly visible at the blade margins as a buildup of brilliantly refractile, blue-white vesicular material; a loose network of mold mycelia grows outward from the grass surface through this layer. A few small protozoa are often already present, as are minute, highly mobile algal cells, and, of course, bacteria, yeasts, etc. As the bionous accumulation increases over the next few days, fragments or islands of it break away. These are grossly visible in the culture dish as a flocculant sediment, although finer particles will remain suspended. Whether apart from or attached to the grass blade, it is in these vesicular masses that the protozoa are seen to form—exactly as Reich describes (1:44-48). Certain aspects of the process described below are illustrated in the drawings found on page 19.

At first, there is a discrete coalescence of bion vesicles within the mass (this is more evident at lower power, e.g., 400-600x). As the formation becomes more compact, it stands out more and more from the background. In some, an enclosing membrane has already formed; in others, it is seen as an indistinct, incomplete sagging web between the outermost bions of the cluster. After a membrane forms around the bion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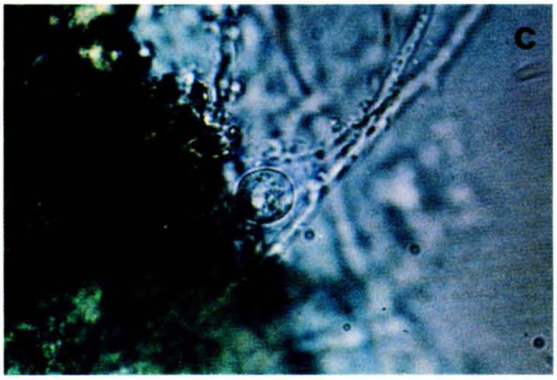
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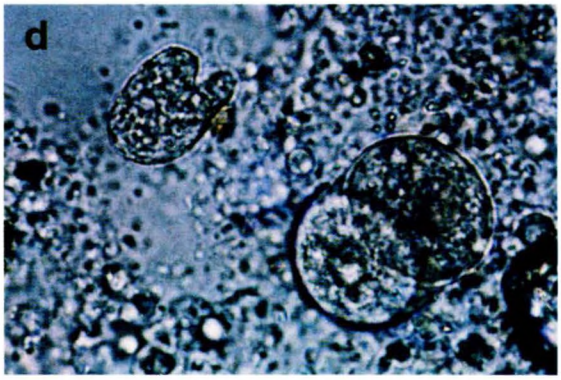
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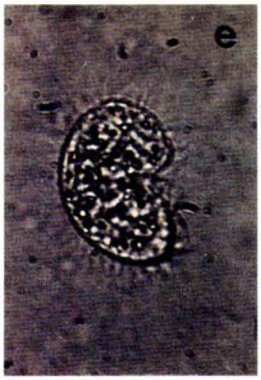
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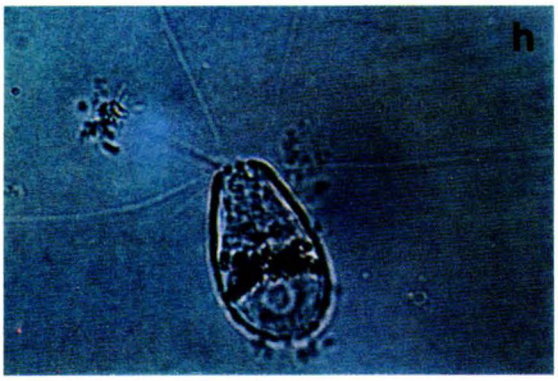
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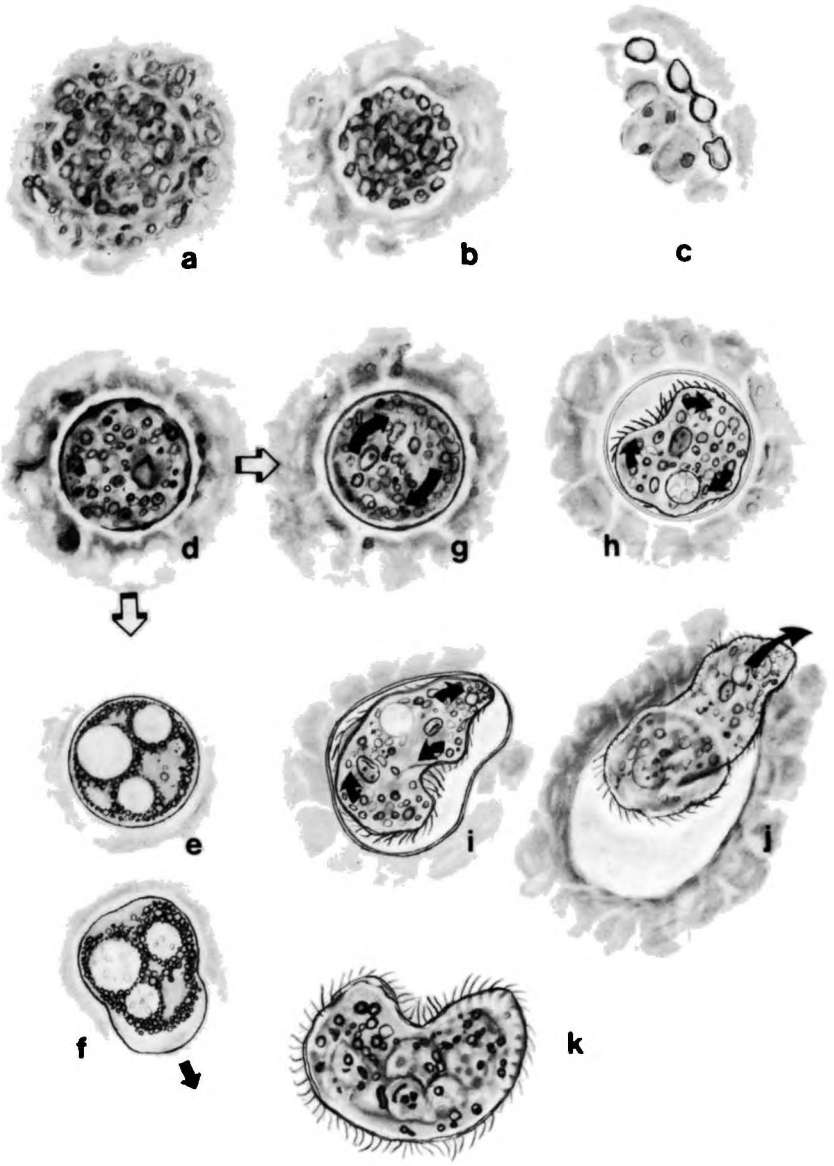


Sketch page

*The drawings show the development of the primal vesicles from the bion heap (a-d). Drawing c is a very much enlarged detail of membrane formation between the peripheral bions of the heap. Figures e and f show the formation of an amoeba, while g through k depict how a typical ciliate (*Colpoda*) develops. These sketches emphasize the common origins of distinct classes of protozoa from apparently identical primal vesicles. It should be noted that the sequence of events illustrated here is in every way the same in bion heaps obtained from rice and starch granules.*

cluster, the formation swells with fluid; the interior bions separate and begin to vibrate. Eventually, the interior bion content starts to rotate as a whole, first in one direction, then the other. In some cases, two separate streams of bions rotating in opposite directions develop within the same formation, and two organisms are produced. As the excitation of the bions increases, the membrane becomes included in the rotation, and the entire structure rises out of the surrounding mass (Fig. 1b). In the formation of ciliates, cilia are often visible at this point. In developing amoebae, the rotation phenomenon is much less prominent or absent altogether. What is significant is that whatever the formation ultimately becomes, *the structure of origin is a taut sphere filled with fluid and excited bions.* Reich, in fact, refers to these spheres as *primal vesicles* (1:44) for precisely this reason, i.e., that both ontologically and phylogenetically speaking, they are the common source of the different classes of protozoa found in the infusion. Just what forces govern the differentiation into one type or another are unknown. Suffice it to say that we observe amoebae, flagellates, and ciliates developing from these kinds of spheres. We might mention here that not all of these formations or primal vesicles inevitably develop into organisms. The process apparently may be suspended indefinitely at this stage, or the structure may lose its tautness, shrink, and disintegrate. This occurs quite frequently in the artificial media, where, for example, one often finds many of the bionous spheres but no active protozoa.

As the infusion "ripens" further, it evidently reaches an optimum condition for the organization of the bion vesicles. In five days, the few protozoa visible are usually small, round, or pear-shaped flagellates; by 10 days, the larger ciliates have appeared; and in 18 days, all the major classes are represented. Viewed at lower power, scores of organisms of all sizes at different stages of formation are seen everywhere in the bionous masses; the organization phenomenon is not difficult to find, i.e., it is not a singular event in the infusion. This could not be some mass "excystment," although here and there one sees organisms in the process of encystment. While some types of cysts can be quite small and could conceivably have been missed in earlier examinations, those of the large ciliates seen here are large structures (30-50μ) and could not have been overlooked in the days before when the active protozoa had not yet appeared.

We are also able to confirm another of Reich's observations. As long as the blades of grass collected include *withered* specimens, the infusions yield plenty of protozoa in five to 10 days. Infusions made exclusively from fresh green grass have, on occasion, required twice as long to disintegrate and yield organisms. In one particular experiment, a blade of grass had retained its green color for two months; there was little evidence of breakdown, and no protozoa, *even though bacteria, yeasts, and molds were plentiful.* This not only confirms Reich's assertion that young, highly charged tissues are more resistant to vesicular disintegration, but, more importantly, in the present context, it raises doubts about the presumed pervasiveness of protozoal cysts in the air. Most significant of all is that *the appearance of the protozoa in the infusions is inevitably tied to the bionous disintegration of the plant tissue;* in all the many infusions we have prepared thus far, we have encountered no exceptions.

Long Term Changes in the Grass Infusion

The rich and varied fauna that develops

in the grass infusion remains fairly stable for months; then shifts in the population become apparent. For a time, certain varieties of protozoa seem to predominate and then decline, while others become preeminent. One, therefore, sees different forms of amoebae, ciliates, etc., come and go. Ultimately, all the organisms except for an occasional minute flagellate die off completely. One's first thoughts are that the infusion's capacity as a food supply has been exhausted, and that because of an accumulation of waste products and dead organisms, the environment has become too toxic. Microscopically, the once dense bionous masses within the cellulose structure of the grass now appear depleted and "lacy." Whatever the cause, once the protozoa are gone, bacteria, algae, and fungi proliferate to a point of stagnation, and no other forms are encountered. This stands in distinct contrast to the fate of the artificial media in our experiment, which will be discussed later on.

The Question of Cysts

Before proceeding to the substance of our report, some background into the subject of protozoal germs or cysts may be in order. They are, in one form or another, at the heart of almost every objection to Reich's work in biogenesis.

Reich is scathing in his attack on the air germ theory. In *The Cancer Biopathy*, he most forcefully points out several of its illogical aspects, citing his own experiments and one of Plouchet's, which cast considerable doubt on the proposition that these cysts pervade the atmosphere. But he also says: "Not one advocate of this theory has been able to demonstrate the existence of these germs" (1:66). This is not exactly the case. The phenomenon of encystment and its reverse, excystment, has been documented in many if not all species of protozoa. Several examples are illustrated in Kudo's book (2:175-179; 745), and he regards the dissemination of cysts to remote locations by wind, water, insects, birds, and animals to be a plausible explanation for the world-wide distribution of protozoa. However, as one goes through Kudo's textbook species by species, cyst production is specifically mentioned in certain organisms but not in others. Reich is doubtless correct in his criticism that the universality of the encystment phenomenon is an *assumption*, and that no one has proved that every free-living protozoan can be cultured from the air. As Kudo himself states:

> *Although encystment seems to be an essential phase in the life cycle of Protozoa in general, there are certain Protozoa including such common and widely distributed forms as the species of* Paramecium *in which this phenomenon has not been definitely observed. (2:179)*

The cyst is a form that the fully active mature protozoan (trophozoite) may assume when, for a number of reasons, the environment becomes inclement. These include a lack of nutrition, overpopulation, dehydration, changes in pH, oxygen tension, temperature, and the accumulation of waste products in the medium. We would add to this from our own observations that organisms will sometimes undergo encystment after prolonged periods of activity, e.g., feeding, as if they were "taking a rest," or as a temporary phase prior to division. In the course of the change, the cell stops moving, rounds up, and undergoes "dedifferentiation." External appendages such as cilia or flagellae are absorbed; internal organelles are either absorbed or extruded; and undigested debris is expelled. The nucleus breaks up and becomes disseminated as chromatin particles in the cyto-

plasm. Finally, a tough enveloping pellicle is produced. In some species, such cysts have been shown to remain viable for up to 10 years. When favorable conditions are restored, e.g., rehydration, etc., the organism undergoes "redifferentiation" and bursts free of the cystic sac (excystment).

Needless to say, the process by which these organisms change to the encysted state and back again is quite remarkable, and worthy of discussion here not only because of its critical relevance to the question of air "contamination" of infusions, but also because some of its features resemble what is seen in the organization of protozoa from the bion vesicles. In fact, encystment may be observed simultaneously next to the same particle of grass in which we follow the organization process. An inexperienced observer or one who makes a brief, casual examination might easily confuse the two. In reality, the resemblance *in appearance* between cysts and the vesicular formations that Reich describes are superficial. Following the *process* of encystment to its final result—the cyst—is invaluable in this regard, since there is no possible argument as to what one is seeing. Conversely, as Reich repeatedly emphasizes, it is essential to watch a particular formation for hours at a time—sometimes over a period of one or two days—to fully appreciate the *organization* of a protozoan.* We might infer that biologists may have actually witnessed various *portions* of the organization process, but, given their bias, have always assumed it was *excystment*. One may wonder if Reich could not have been similarly misled, instead mistaking excystment for organization; however, this question becomes academic in view of the fact that he took considerable pains to film the process from start to finish. It appears to us that the larger significance of any similarities between these *processes* is that they reflect functional relationships, i.e., that biogenesis and metamorphosis in the protozoan are connected in some fundamental way that is as yet not understood.

We would conclude with the observation that the function of encystment, which evidently plays a role in the survival of certain protozoa, need not be "a bone of contention" in the controversy over Reich's work. What is objectionable and destructive is the literally blind insistence—partially based on the phenomenon of encystment itself—that one need look no further to account for the protozoa in the grass infusion.

The Air Germ Experiment: Materials and Methods

We are now prepared to describe in detail how the air germ experiment was conducted. Over a two-year period, the protocol was repeated three times. For reasons that will be apparent in the results, no inoculated media were required in the last two trials. In the latest run, begun in March, 1987, and still under observation, only one type of medium (Medium 1) was employed. In all three trials, grass infusions were set up concurrently.

A. Preparation and Disposition of Culture Media

1. **Medium 1,** considered suitable for amoebae and small flagellated paramecia (chilomonas), consists of a base of the following weak salt solution:

* We have observed the complete encystment of colpoda, for example, to require as little as 90 minutes.

NaCl - 0.1 gm
KCl - 0.004 gm
$CaCl_2$ - 0.006 gm
Distilled water - 1000 cc

150 cc of this solution (non-sterile) was apportioned to each of 7 nine-ounce, shallow, wide-mouthed glass jars; three grains of uncooked white rice were added to each.

2. **Medium 2,** for fresh water ciliates, consists simply of a tiny pinch of pulverized, unsalted soda cracker—dried lettuce or bread may also be used—in 150 cc of distilled water. Again, 7 jars were prepared.

The 14 jars* were banded on the outside with an inkmark at the original water line, so that losses due to evaporation could be accurately replaced with distilled water. The openings were covered with lids fitted with plastic window screening. All were allowed to stand four days in the laboratory to permit an abundant growth of bacteria, i.e., "ripening." They were then placed outside in an open field away from trees and buildings in receptacles atop three-foot high stakes. After 20 hours of exposure (1PM to 9AM), they were retrieved and placed together on a table in the laboratory. The Medium 1 cultures were each covered with a small pane of glass; Medium 2 cultures retained their screened lids.

Three jars of each medium were set aside for observation without inoculation. The remaining four pairs were inoculated as follows, using separate Pasteur pipettes:

I. Two drops each day for two days (total four drops) from a grass infusion prepared 10 days earlier.

II. Two drops daily x two days from stagnant ground water.

III. Two drops daily x two days from a fishpond that had been treated with an algacide.

IV. Two drops daily x two days from an autoclaved grass infusion, including a particle of the cooked grass.

The sources for inoculation were first checked microscopically for evidence of protozoal activity, and except for the autoclaved grass, were found to have an extensive and vigorously active fauna, including mastigophorae (flagellates), sarcodinae (amoebae), and ciliata (e.g., paramecia, colpoda, chilodonellae, stentor, and vorticellae). The stagnant ground and fishpond waters also contained cyanobacteria, green algae, diatoms, and various small motile plant cells. These sources of inoculae were rich with masses of brilliantly radiating, blue-white bion vesicles among which the protista appeared to browse. Organisms in every stage of development and activity, e.g., contraction or expansion, division, etc., were evident everywhere. Only the autoclaved grass infusion was devoid of activity, showing fragments of decolorized plant material, grass cell inclusions, and bion vesicles, singly or in small clusters.

* The second series of these cultures was begun 19 days later.

B. Maintenance of the Cultures

In normal practice, the stability of the population in protozoal aquaria is maintained by periodically pouring off some of the fluid from the culture vessel and replacing it with fresh medium. This prevents the accumulation of metabolic waste products and dead organisms, whose biochemical effects might favor or prejudice the survival and growth of particular species. We elected to see what would happen without any artificial intervention. Apart from once or twice weekly additions of room temperature distilled water to restore losses due to evaporation, the cultures were left undisturbed in the laboratory, subject to ambient light and temperature changes.

C. Obtaining Specimens for Examination

No sterile precautions were taken with individual jars; however, a fresh, separate Pasteur pipette was used for each sampling so as to avoid contamination between jars. Initially, specimens were centrifuged to concentrate the formed elements in the samples. This was necessary only for the first week to adequately assess the as yet thin growth of bacteria, algae, etc. Later, only a few drops of fluid and a few particles of sediment from the bottom of the jar were obtained.

D. Microscopic Examination

In most cases, specimens were examined in a well slide, using a 20x objective and 15x eyepieces fitted with a calibrated reticule for determining the dimensions of the organisms. With the 1.5x magnification factor in the Reichert microscope body, an overall magnification of 450x was obtained. Certain processes, e.g., fine bion vibrations and membrane formation, required higher powers, i.e., 800x, 1000x, 2000x, or more. In these situations, the high-dry or oil immersion lenses were used with a flat slide and coverslip. For prolonged observations, the well slide and coverslip combination described by Reich (1:46) was employed. With the acquisition of a Zeiss photomicroscope ("Axioplan"), we were able to repeat and simultaneously photograph some of our observations at film magnifications up to 1600x. This instrument, however, did not arrive in time to document all the findings described in this paper.

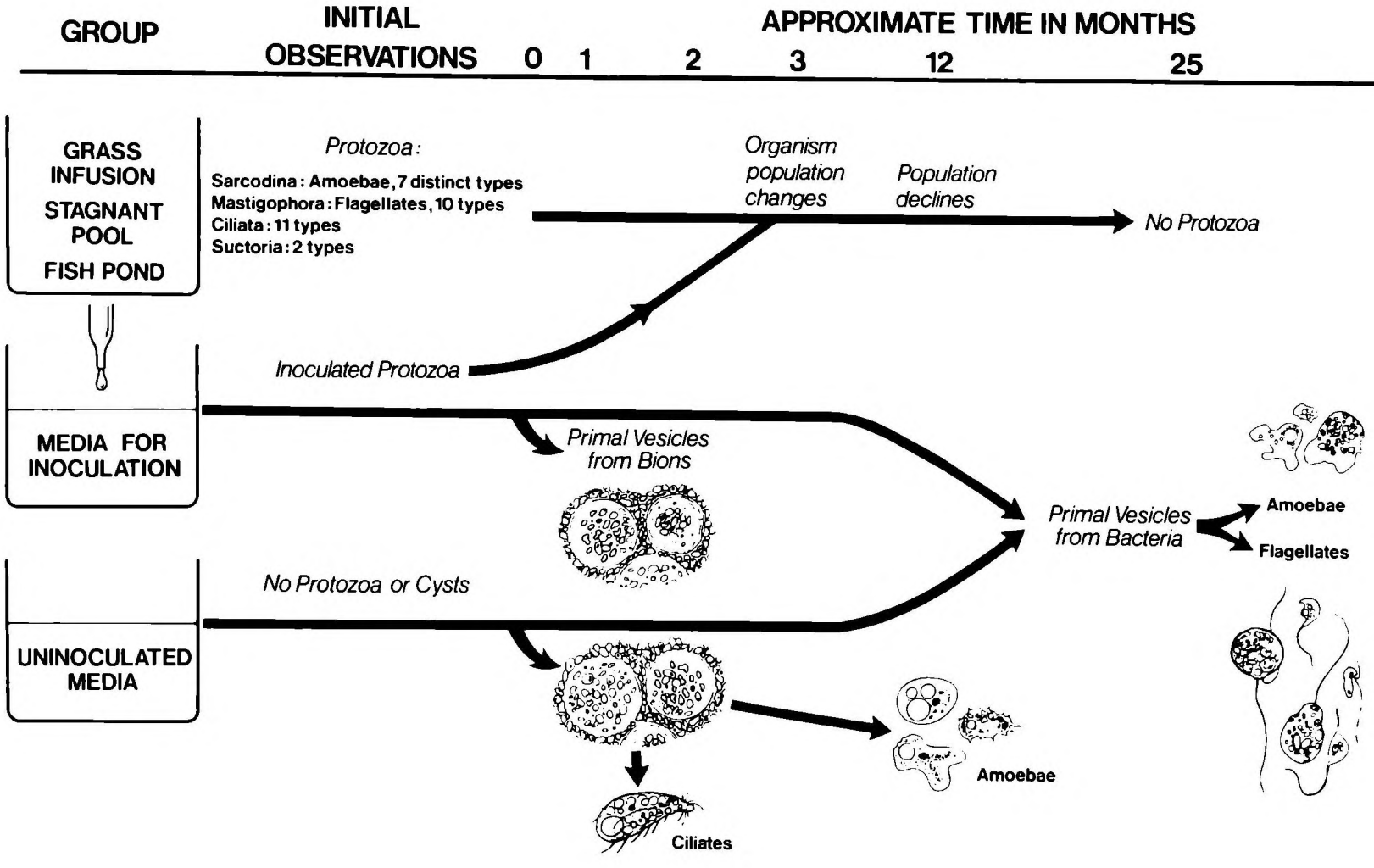
The Air Germ Experiment: Results

A summary of the more critical findings is presented in the flow-chart on page 25. Certain details of the individual preparations that are pertinent to our discussion and conclusions are presented below.

A. The Inoculated Media

The principle purpose of this group of eight cultures was to ascertain the suitability of the two media for the germination of airborne protozoal cysts. The presumption was that if the seeded active protozoa (trophozoites) thrive, then any of their cysts that might fall into these media from the air should excyst and thrive as well. Where possible, the results are treated as a whole, the distinctions between the individual cultures being of less consequence than comparisons to the sources of inoculation and to the uninoculated media.

1. The essential and critical finding in the inoculated cultures is that the various organisms transplanted from the three separate sources,



RESULTS: Major Developments

i.e., grass infusion, fishpond, and stagnant pool waters, lived and reproduced successfully in the artificial media for at least three months with no other care than the replacement of water losses due to evaporation. *All* the seeded cultures grew out the same protozoa present in the particular source from which they were inoculated.

2. Interestingly, the "amoeba" medium (Medium 1) supported the growth of ciliates and flagellates of all kinds, as well as it did amoebae, and, conversely, the "ciliate" medium (Medium 2) also maintained amoebae and flagellates.
3. As in the grass infusion, pond water, etc., the populations in the individual jars of inoculated media began to show a shifting in the relative numbers of particular protozoal varieties.
4. Like the grass infusion, etc., certain tendencies emerged as these cultures aged. After about a year, the preparations looked like "graveyards." The dead remains of various ciliates were commonly found. However, *plentiful* bion heaps remained, which were infiltrated by bright green algae of every description; in addition, there were scores of primal vesicles of different sizes, with membranes and internal vesicular structure. Often they were found in tight clusters like bunches of grapes. Most were shrunken and motionless, but a few appeared taut, exhibiting alternating rotational movements of the vesicles within. Only in one rice culture were active protozoa found: an exclusive and uniform population of large (80-100 μ), flowing amoebae with highly colored inclusions (Fig. 1). The other cultures at this time showed a few kinds of minute flagellates with green chromatophores, which were most likely motile algal cells.
5. The Media Inoculated from the Autoclaved Grass Infusion:

   For a period of two years, no protozoal forms were found in these preparations, although bacteria, molds, mold sporangia, and algae were consistently present. This condition prevailed even after the rice and cracker particles had disintegrated beyond recognition. Both jars showed masses of vesicular material but few signs of organization.

B. The Uninoculated Media

This group, inasmuch as it was believed that it would reflect only what had fallen out of the air, was naturally the focus of some concern and excitement. However, the expectation was that other than bacteria, molds, and possibly algae, nothing would appear in them. Thus they would serve as an unequivocal demonstration that protozoal cysts do *not* pervade the atmosphere, and that what one sees in the grass infusion is exclusively the result of the spontaneous organization of the grass vesicles. This hope for a clean resolution did not last long.

In three series of uninoculated media (15 cultures), the same protozoan was found on two separate occasions in the rice medium. It was detected on the 19th day in the first run (Culture 1JIII) and on the 60th day of the third (1JII). None of the other unseeded cultures

showed protozoa during these periods. In each case, the organisms were few in number and the population exculsive and homogeneous. They were rapidly motile, elongated, teardrop-shaped, 12 x 25 μ ciliates with somewhat plastic bodies, which on side view were flattened and slightly concave on the ventral surface (see flowchart on page 25). They resembled a species of small colpoda. In a week, their numbers had increased, and they had evidently also grown in size; some individuals of 32 μ were seen. Yet in a month's time, they began to decline and eventually disappeared.*

This finding haunted the proceedings for the next two years; one was forced to concede that circumstantial evidence for at least one airborne protozoal cyst had been found. The thought occurred that these organisms might have organized in bions from the disintegrating rice; yet in the first case, in which surface and bottom fluid had been sampled and centrifuged, no bion heaps or spherical formations were seen. The organisms were just "there"—swimming around in a microscopic field dotted with bean-shaped blue vesicles.

Convincing evidence of their real origin came two years later, when, after finding the organisms in a jar from the third series, a section of the rice kernel itself was examined under the microscope. In the surface layer, where bionous disintegration was most advanced, several spherical formations in various stages of development were readily seen. In one (Fig. 2c), two nearly complete organisms were observed rotating vigorously around one another. (For comparison, earlier stages are shown in Figs. 2a, 2b.) In these, the vesicular movements that Reich describes were quite brisk, causing the bions to be blurred in the photographs.

Resuming the account of the first series (in its second month), various structures had appeared in most of the jars. The rice and cracker particles had disintegrated almost completely. The resultant bionous masses were shot full with 17-18 μ spheres having sharply defined membranes and a few internal vesicular elements which were motionless. During the next 11 months, green algae became grossly evident in the cultures. No active protozoa were found. It was as if the organization process had reached a certain point and then ground to a halt. At the same time, it was most gratifying to realize that *none of the same protozoa found in the grass infusion, fishpond, stagnant pool, or seeded media had yet appeared in these uninoculated media.*

At 372 days, it appeared that the experiment had amply confirmed Reich's assertions about the air germ theory. The cultures were once again examined in anticipation of discarding some of them. In some, grape-like clusters of vesicle-filled spheres (18-30μ) still crammed the bionous masses that had accumulated. A few motile algae were found in Medium 2, but as before, everything else looked "dead." The sole exception was 1JIII, which had previously, for a time, contained the small ciliates; here the picture was quite different. Grossly, there was far less algal overgrowth. Microscopically,

* They are still present in the one culture (1JII) from Series 3 at the time of this writing.

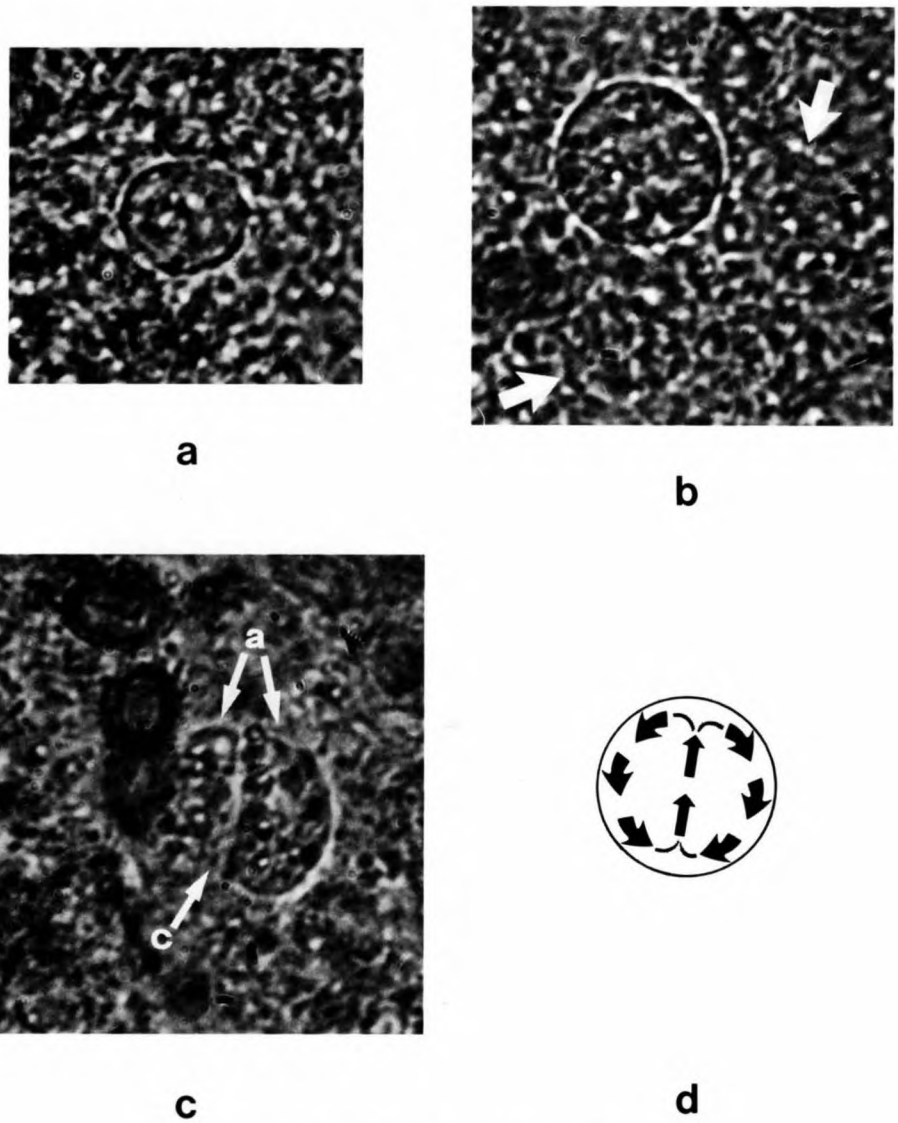


Fig. 2. The formation of protozoa in rice.

a) A primal vesicle in its earliest stages. Its membrane, while well defined, is not yet taut; the bions within were vibrating so rapidly that they are blurred in the photograph. 1600x.
b) A primal vesicle at a later stage of evolution. The membrane is now taut and smooth and the entire structure appears expanded. In this case, rotation of the contents had already begun. The arrows indicate adjacent formations at earlier stages of development. 1600x.
c) Two nearly complete ciliates (arrows a) arising in the same primal vesicle. Although barely evident in the photograph, cilia (arrow c) were plainly visible at this stage. The dark bean-shaped objects (left, upper) are algal cells. 1600 x.
d) A diagrammatic representation of the currents which appeared within the primal vesicle (b) prior to the development of the two ciliates. As the protozoa themselves develop, the entire structure begins to rotate.

some of the bionous spheres were found to have very slow and discrete amoeboid motion. Once the movement was recognized, several of these organisms were readily seen. Moreover, in thin floating sheets of bions, one could see very clearly all the stages by which these amoebae organized. Focusing up and down at high power brought out previously unnoticed details of membrane formation. In the radiating bridges between the peripheral bions of the formations, a slender filamentous connection becomes visible. At first broken and incomplete, it eventually bridges the gap between all the outermost vesicles so that the entire formation is encircled. It is as if the membrane had condensed or precipitated out of the bridging fields (sketch page, drawings b and c); at first net-like, it holds the vesicles together, and then, as the interstices are "filled in," it transforms into an incompletely expanded sack. Obviously, as the membrane evolves, it must also acquire semipermeable characteristics, since it eventually "inflates" with fluid and becomes taut (drawing d). We must also infer that the fluid within these spherical formations undergoes an evolution of its own; the amoeboid movements of the cell plasm which follow imply physical properties not possessed by simple aqueous solutions. The answer to this riddle may lie in a phenomenon we have witnessed repeatedly in this and other cultures; as the amoebae become more "complete," there is often a confluence or fusion of the internal vesicles, which produces a clear cytoplasm that begins to flow in typical amoeboid fashion. Reich reports this in his observations on the organization of both protozoa and cancer cells, making the additional point that: *"The more bions flow together, that is, the more fluid the plasma, the greater is the motility of the total organism" (1:46).*

The same kind of amoeba was encountered in a variety of vegetative states (some of these are illustrated in the flow chart). What was remarkable and unexpected was that the entire fauna should consist exclusively of just one species of protozoa.* Because of the wealth of activity in 1JIII, most of the remaining jars of media were kept. One could not predict whether or not their "dormancy" would end, and what protozoa, if any, might appear. Over the next year, however, all the cultures appeared to deteriorate. The once-numerous bionous spheres in most jars shrivelled or disintegrated. The amoebae in 1JIII had disappeared and green algae seemed to have taken over everywhere. Even the hardy fungal mycelia had died off, leaving dense clusters of brown-black sporangia. The only live protozoa in evidence were minute fusiform flagellates in three of the Medium 2 cultures.

Long Term Results in the Artificial Media: 25 Months

We have described the ultimate state of stagnation reached in the grass infusions. Toward the end of two years, conditions in the artificial media seemed to be heading in the same direction. We were at the point of terminating our observations and discarding everything. The six remaining Medium 2 cultures, being constantly open to the

* Photographs of this amoeba, discovered in a rice culture from the third series of experiments, may be found in Figure 5d and e.

air,* suffered heavy water losses due to evaporation, their replenishment having been neglected. Examination showed no active protozoa; we could not find the fusiform flagellates noted above. Out of curiosity, we decided to allow the jars to dry out completely and see what would result upon rehydration. After a few weeks in a dessicated state, distilled water was added up to the original levels, covering the encrusted remains. Much to our surprise, in the 13-17 days afterwards, we found the identical amoebae active in four of the six rehydrated cultures. *In every case, they could be seen developing in heaps of bacteria.* Furthermore, in three of the four, there were varieties of flagellate organisms that had not been present previously.

Over the next two months, these and the 10 surviving rice cultures were examined repeatedly. The results are tabulated in the chart below, with references to the pertinent photomicrographs. In essence, each type of medium had yielded its own specific amoebae. The relevance of the dehydration-rehydration procedure is unclear; it may have been only fortuitous in that it led to a review of all the cultures; new organisms also appeared in cultures which had never dried out. The distribution of the assortment of flagellates follows no definite pattern; however, their greater frequency and variety in Medium 2 (3/5 versus 3/10) may be meaningful. It is significant that in one instance, round monoflagellar organisms were seen to organize in bacterial heaps; Medium 2 may be more "prone" to flagellate production for some reason.

Of particular interest is the fact that the media seeded with autoclaved grass, which had shown nothing for nearly two years, now contained spherical bion formations, amoebae forming in bacteria, and flagellates. It is our impression—supported by the findings in the other jars—that these organisms were more likely the result of breakdown of the rice and soda cracker, rather than of the autoclaved grass which had been included. Reich says he obtained protozoa from grass heated at temperatures between 50°and 80°C (1:43). Evidently, the autoclavation process (120° at 15 lbs. pressure x 15 minutes), rather than just killing any of the postulated air germs of protozoa, alters the grass in some crucial respect so that the resulting vesicles do not organize. This, of course, suggests that there may be complexities to "sterilization" that have been overlooked.

One can only speculate on the oddities found in some of these cultures, e.g., the "dendritic" amoebae in 1JIVA which resembles a parasite of algae, the large, colorful amoebae in 1JIIIA, which have been the sole survivors there for nearly two years, and the single "rice" amoebae in the rehydrated 2JII. The relatively sudden appearance of new organisms in the face of apparent stagnation is also somewhat puzzling. It may be significant that this "rejuvenation" coincided with the coming of spring. Yet, at the same time, despite a diligent search, we were unable to find any of these same amoebae in the grass infusions, etc., which remained "dead."

What seems important about these long-term results is that they demonstrate :

1. Despite their long exposure to the air, the cultures do not develop the same (specific) protozoa as do the grass infusions, etc.
2. The media have a capacity to generate and support a succession of organisms for over two years.
3. The organisms which they do produce

* These were covered only with lids of plastic window screening.

Organisms	Photograph or Drawing (Typical)	Cultures	Series
Amoeba, minute; most 5μ or less, one example 6-7μ ; very slowly amoeboid	Fig. 6a	1JI, 1JII, 1JIII 1JI, 1JII, 1JIII 1JIIIA 2JII rehydrated	1 2 1 1
Amoeba, small; most just over 10μ ; cytoplasm pale green clear, 1-3 contractile vacuoles; slowly amoeboid	Fig. 3d Fig. 6b	2JII, rehydrated 2JII, 2JIII rehydrated 2JIA rehydrated	1 2 1
Amoeba, small; just over 10μ ; cytoplasm pale green with coarse granules; 1-3 contractile vacuoles; slowly amoeboid	Fig. 3f	2JII rehydrated	2
Amoeba, minute; 5-8μ ; bean-shaped body with dentritic filopodia; very slowly moving	Fig. 6c	1JIVA	1
Amoeba, large, 80-100μ ; coarse colorful granules and inclusions; briskly amoeboid	Fig. li	1JIIIA - present since inoculation	1
Flagellate, round; 10μ ; 1 flagellum	Not Illustrated	2JIII rehydrated	1
Flagellate, round; 10μ body; 2 flagella	Fig. 6d	2JIII rehydrated	1
Flagellate, pear-shaped; 10μ body; 1 flagellum	Fig. 6e	2JII rehydrated	2
Flagellate, fusiform; 6μ body; 1 flagellum	Fig. 6f	1JI 1JII 2JIVA rehydrated	1 2 1
Flagellate, fusiform 6μ body; 1 flagellum; amoeboid	Fig. 6g	2JII rehydrated	1
Flagellate, L-shaped body; 5-7μ ; 2 flagellae	Fig. 6h	1JIIA	1

over time become smaller, less varied, and more exclusively amoebae.

4. The existence of a previously unknown phenomenon: the organization of amoebae from bacterial cells.

A New Finding: The Organization of Amoebae from Bacteria

In studying the grass infusion and artificial media, a phenomenon was encountered which, to our knowledge, was not reported by Reich. Thin preparations of bottom sediments (using a flat slide and coverslip) revealed the organization of minute (4-15μ) amoebae from bacteria. At first glance, it appeared that amoebae were moving through and engulfing sheets and piles of bacteria. As we watched, fascinated, it became obvious that we were witnessing something more than mere predation. The process was particularly vivid and easy to follow because of the relative lack of distracting and confusing background clutter; one had only to add water to the edge of the coverslip periodically to permit extended viewing. Our attention was drawn to irregularities in the disposition of the bacteria. Here and there, in a field where they lay more or less evenly distributed, one found small clusters of a dozen or more. Where they touched, they had fused to form large blue bions (Fig. 3a). In some cases, the bacillae involved had first developed nodular swellings (Fig. 3b). As membrane formation began, the form of the amoeba became apparent in the aggregate (Fig. 3c). If the internal vesicles fused, the protozoan matured with clear cytoplasm (Figs. 3c and d); otherwise, an amoeba with granules developed (Figs. 3e and f).

The process could appear quite different in another culture, as we see in Figures 4a, b and c. From these pictures, one can see how the size of the "finished" amoeba is related to the size of the clump of bacteria from which it derives. The last photograph in this series shows several amoebae in the final stages (Fig. 4d). They remained in a taut, spherical state for some time before the characteristic pseudopodial formation began and they moved away. During this stationary period, the pulsation of the contractile vacuoles and the excitation of the internal granules were quite prominent.

Discussion

The results clearly show that the culture media used do support the growth of organisms transplanted from grass infusions and other naturally occurring habitats. The fact that a variety of *classes* of protozoa could survive and reproduce in *either* medium for a period in excess of one year indicates that the media satisfy a critical requirement in our experimental design.

If the assertion that the protozoa in the grass infusions and other sources develop from airborne cysts were entirely correct, then the liberal exposure of our media indoors and out, and the avoidance of all sterile technique, should have resulted in the appearance of the same organisms that occur naturally. These media did indeed produce bacteria, fungi, algae, and eventually protozoa. However, these protozoa were exclusively a few varieties of minute amoebae and flagellates,* and one type of ciliate; none of the multitude of species encountered in the grass infusions, etc.,

* These amoebae and flagellates may actually be different stages in the life cycle of the same organism. There are known varieties of small amoebae that have a flagellate phase, as well as flagellates that have an amoebic ("palmella") phase. We have not yet identified the organisms in our cultures in our textbook of protozoology.

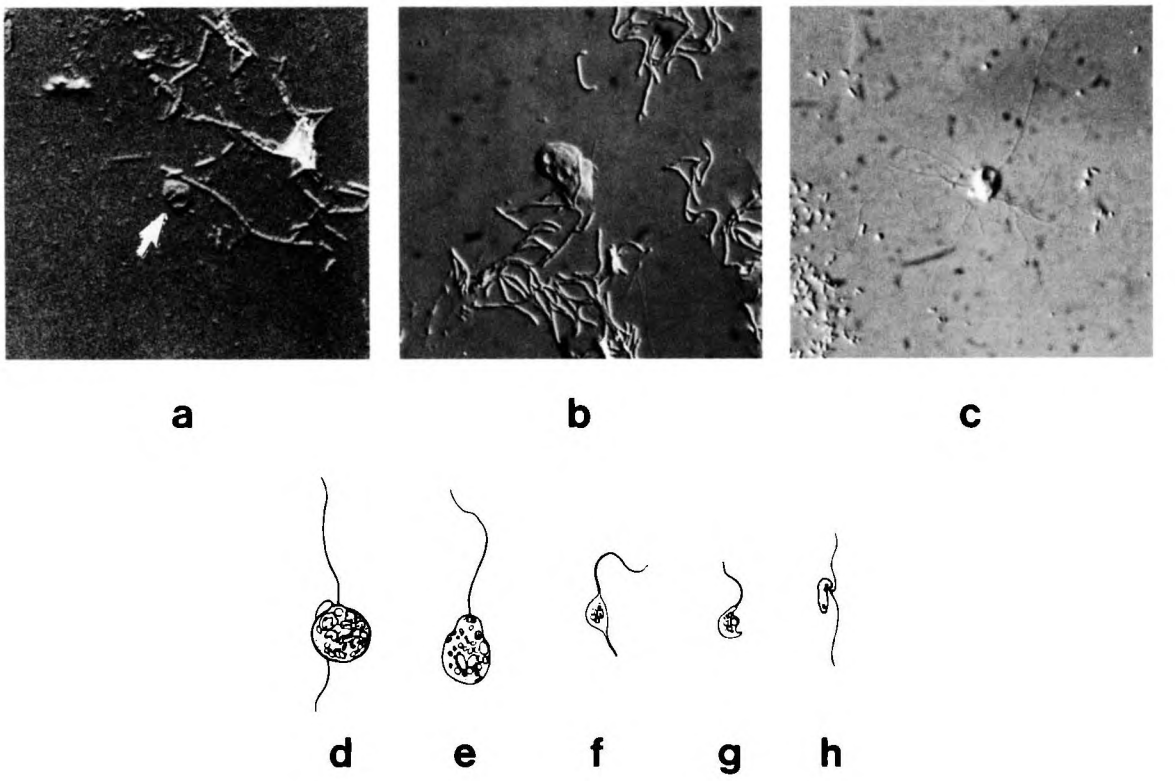


Fig. 6. Organisms found in the artificial media at 25 months. (a - c) 640x, Nomarski DIC; (d - h) drawn from life.

In (a) is shown the species of amoeba found almost exclusively in Medium 1. The example here, indicated by the arrow, exhibits a prominent contractile vacuole. Photograph (b) is a view of the amoeba typically found in Medium 2. It is seen in association with the variety of bacteria from which this type has been observed to organize. The unusual amoeba in (c) was encountered in only one culture. Instead of pseudopodia, it has produced long, slender, branching filopodia. Because of their similarity to the dendritic processes seen on nerve cells, we have termed these amoebae "dendritic"; their exact identity has not yet been determined. (d) through (h) are drawings of the flagellates discovered in these media. Except for (d), which resembles chlamydomonas, none of the protozoa illustrated on this page have been found in the grass infusions or other natural habitats. A comparison with the size and complexity of the organisms seen in Figure 1 (magnified to the same degree) is striking.

were present. Proponents of the air germ theory must explain why, in over two years, out of scores of possible organisms, not one of their cysts appears to have fallen into any of our cultures, while simultaneously they developed profusely in infusions of washed grass. This discrepancy, even without the other findings mentioned in this report, casts serious doubt on the validity of a supposition that has long been promulgated and accepted as fact.

Initially, the discovery of protozoa in the uninoculated media appeared to mar the clarity of our results. But this finding was later to assume an altogether different significance when it was learned that these organisms develop in the bionous breakdown products of the medium itself. *The rotting surface of the rice kernel had to be examined to ascertain their origins*; the delay in their appearance is due simply to the slowness with which the rice disintegrates. Unlike the grass, which generally breaks down within five days, the rice remains firm in its center for well over a month. If one crushes a fresh kernel and examines it in water at high power, one sees that the fragments consist of many smaller interlocking, sharply faceted, crystal-like particles (Fig. 5a). As the kernel swells and softens in the water, mold mycelia penetrate, and facilitate the mechanical breakup of the rice structure; a heavy growth of bacteria seems to accelerate the process. The particles themselves soften, lose their angularity, and yield vesicles by budding in exactly the same fashion as do particles of iron or charcoal when they are heated and made to swell. It takes months for the fluid and mycelia to infiltrate the rice thoroughly and reduce it to a gelatinous mass. Ultimately, all one sees under the microscope are masses of round and bean-shaped blue vesicles which are completely indistinguishable from what is seen in the grass infusions (Figs. 5c). The same thing happens to the starch granules in the soda cracker medium. Amoebae were found to organize from these bions regardless of which medium produced them. It is pertinent to mention here that, according to Kudo (2:882), *amoebae will become grossly visible as rings around the rice grains within two weeks of intentional seeding*. The fact that it took *one to two years* before the amoebae developed in our *unseeded* cultures seems more consistent with the length of time it takes for these media to disintegrate, than with a chance "seeding" from the air.* Even if the observed process by which they arise were totally ignored, it would be difficult to explain their singular *absence* from the grass infusions, etc., if they were simply a result of air contamination.

In summary, the *inoculated* media exhibit two properties:

1. They act as simple growth media for transplanted organisms.
2. Like the grass, they give rise to other protozoa by means of bionous disintegration and organization.** The *unseeded* media serve as a confirmation of the second function, but one which is free of the ambiguities raised by the intentional introduction of an "impure" inoculum of cells. In other words, with them, we obtain a clear picture of what organisms arise in the rice, etc.,

* This is also the source of their long productive "life" mentioned earlier.

** The phenomenon of spontaneous breakdown in culture media was also encountered by Reich in his efforts to cultivate bions. He had considerable difficulty with the appearance of bion growths on media which he had *not* inoculated (3:65-66). One wonders whether or not all culture media merely function passively, providing only a suitable environment and nutrition.

from the organization process per se. In the present case, they are of more than incidental interest, and one which extends beyond their obvious impact on the air germ theory.

As will be recalled, the microscopic picture in all the artificial media at the end of two years was one of increasing *stagnation*, with few signs of protozoal life. It was the chance finding of the amoebae in the rehydrated cultures that led to their discovery in 14 of 16 jars over the next two months.

Even more remarkable was the nearly perfect segregation of mainly two types of amoeba—one kind in Medium 1 and the other in Medium 2. Except for the presence of an assortment of small flagellates in six of the cultures, no other living protozoa were found. One was struck by the extremely small size of these amoebae—particularly in the rice—and how very slowly they moved. Moreover, one could observe their organization from bacteria very clearly. The nearly complete predominance of amoebae affirms in a graphic way the connection which Reich has drawn between them and cancer cells, i.e., that they both develop in an environment of *stagnation*. It now seems less puzzling that the larger, more complex, and highly differentiated protozoa eventually die off in the infusions and cultures; their complexity and vigorous activity are created in and sustained by the relatively high level of energy available early in the life of the grass infusion. Later, as the numbers of cells of all kinds increase and the energy released by disintegration declines, the structures and functions of these organisms can no longer be maintained and they die off. This energy shift has as its chemical counterparts a depletion of nutrients and an accumulation of metabolic (catabolic) products. It seems logical that, at this point, whatever develops and continues to thrive in the infusion must again be a reflection of the changing energetic and chemical status of the entire medium. Such cycles may underlie the shifts in population which we observe. Evidently, the amoebae, by virtue of their simplicity, are capable of organizing and functioning in the wide range of conditions to which they are exposed. Yet, even they are obviously affected by the deterioration of the medium. The trend turns from the many, larger, more complex, free-flowing forms that we see early on, to the few, minute, starkly primitive and lethargic types seen at two years. The whole progression reminds us that charge, structure, and function are inextricably related.

The organization of amoebae from bacteria by a process so similar to that observed in the bion vesicles raises a number of questions. We do not know, for example, to what extent or in what manner the grass, rice, etc., are directly involved. Bacteria form in the infusions within 48 hours, quite some time before bionous disintegration has had time to develop. Bacteria *are* culturable from the air, and will form colonies on solid media and cloudiness in liquid media in as little as one or two days. Yet, in neither of these situations do the bacteria give rise to amoebae. One must wonder why they do so in the infusions; obviously, the disintegrating grass, etc., must exert some critical influence. Reich has described the disintegration of bion vesicles into "rot" bacteria under a number of circumstances; as bion vesicles come from the vegetable material we have used, it is plausible that the bacterial populations of the infusions should reflect both what alights from the air and what develops spontaneously in the culture. Reich, in addition, saw functional identities between bions, red blood cells, algae, bacteria, and

T-bacilli. He either called them bions,* or noted structural or functional similarities to bions:

> *These "algae" are nothing but our bion vesicles into which any organic tissue disintegrates when it swells. (1:43)*
> *...the strongly orgone-charged erythrocytes act upon bacteria and small protozoa just like bions, e.g., of earth, iron or coal. (1:34)*

Bacteria, under the right conditions, must share the bions' potential for undergoing organization into more complex structures.**

The organization of bacteria occurs early in the life of the grass infusion—simultaneously with the development of other organisms in the masses of blue bions; old, stagnated grass infusions contained no amoebae, even though bacteria were still plentiful. Yet, at 25 months, the artificial media contained *specific* amoebae organizing in bacteria. Clearly, some quality of the parent material is being transmitted through the process of disintegration and organization. Whether or not this is due to a strictly genetic mechanism we cannot say; if so, it could be an extremely complicated and technically difficult one to work out. Since the amoebae derive from bacteria, it may be the bacterial *species* which is the determining factor; there is some suggestion of this in the photographs. The bacterial type, in turn, may simply be the one most readily generated in, and/or supported by, the particular medium. This question, it appears to us, is more accessible through experimentation. One could, for example, plate out each medium for a bacteriological qualitative analysis to see if a correlation with an amoebic variety exists. At this point, however, all we can say is that different amoebae are apparently generated from different sources in the medium by nearly identical processes. Some clue to a more general role of the medium in the organization of the bacteria *is* suggested by some other work of Reich.

The observation of the formation of amoebae from bacteria brought home with exciting clarity the accuracy of Reich's description of the organization of protozoa. Certain details are also significant here because of their bearing on two other findings of Reich's. In this process, the bacterial cells aggregate, swell, and fuse with one another to form clumps of larger vesicles in which the amoebae take form. Reich found that T-bacilli, when added to fresh, particle-free blood plasma, behave similarly; that is, they agglutinate, swell, and give rise to PA bions (1:30). Also, in Experiment XX, the addition of T-bacilli to the flakes in thawed earth bion water seems to promote the formation of the minute flagellated protozoa Reich termed *orgonomia* (1:61). It appears to us that, in the present case, the energy liberated into the water from the disintegration of the grass, rice, etc., had the same effect on the bacteria as did that from the highly charged plasma and earth in Reich's experiments, i.e., *it is yet another manifestation of the orgonotic potential.* If this interpretation is correct, then our findings constitute additional evidence in support of one of Reich's major concepts: The orgonotic potential is the essential physical property of the orgone and the driving force underlying the organization process in biogenesis.

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* T-bacilli are actually referred to as "T-bions" (1:29).

** This is not at all far-fetched, given the context of recent ideas on how life was "assembled" eons ago—not to mention our own findings.

Summary and Conclusions

1. An experimental protocol testing the premises of the air germ theory is presented.
2. The results show that, while protozoa from grass infusions and other natural sources grow in artificial media after intentional seeding, these same species do not appear in the media after simple exposure to the air.
3. The unseeded media, after some delay, do give rise to protozoal forms over a period of 20 days to 25 months. These organisms consisted of a small ciliate in two of 16 cultures, an assortment of small flagellates in six of 16, and amoebae in 14 of 16. None of these same species are found simultaneously in the grass infusions, etc.
4. In every case, the protozoa found in the unseeded cultures are seen to organize in bion vesicles which derive from the disintegration of the media. This occurs in the same fashion as described by Reich for the grass infusion.
5. We have independently confirmed the accuracy of Reich's observations on the organization of protozoa and have made what is believed to be a new finding: the organization of amoebae and flagellates from heaps of bacteria. These processes are described and partially documented with photomicrographs.
6. The findings are in support of Reich's assertions that the conventional explanations for the origin of the protozoa in the grass infusions are erroneous.
7. Certain observations in the present study are related to other experiments of Reich's; their bearing on the orgonotic potential as the driving force in biogenesis is discussed.

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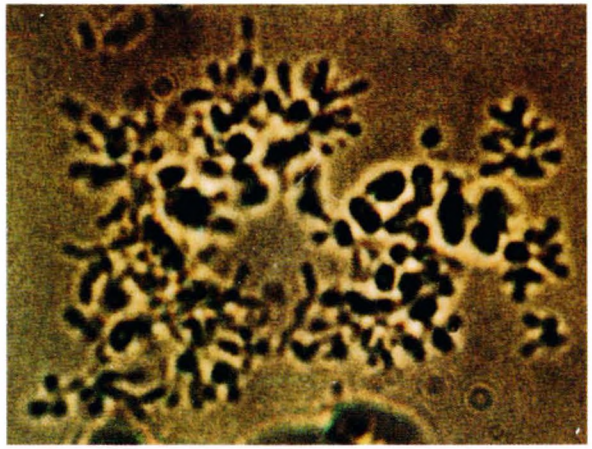

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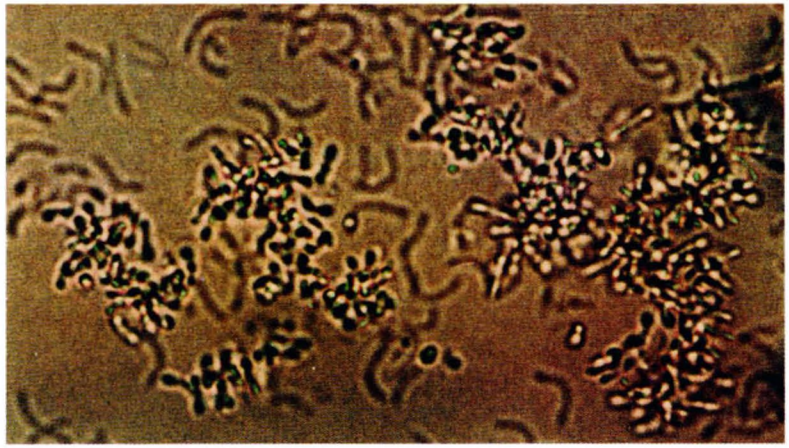

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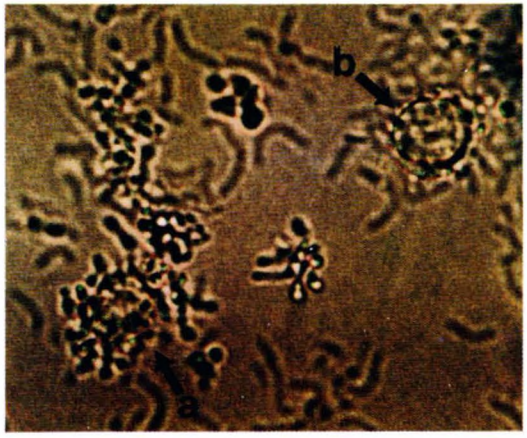

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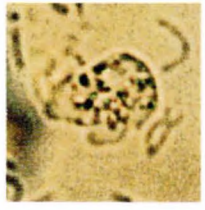

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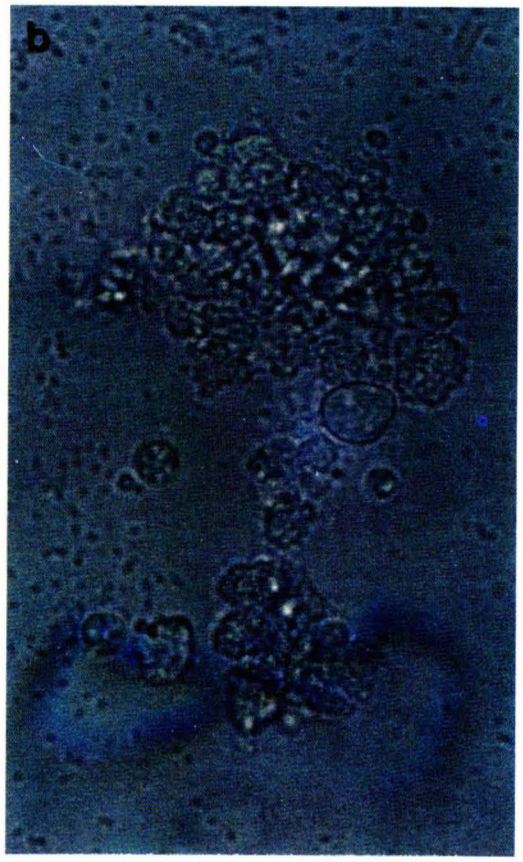
Fig. 3. (opposite page) The formation of amoebae from bacteria in Medium 2.

a) In this photograph, one can see the formation of large blue bions in clusters of bacilli. Whether the cluster itself forms from the divisions of a single individual or from a congregation of cells is unknown. 2000x.
b) The same process as seen in (a); nodular swellings are seen in the bacteria. The swelling appears to occur mostly at the ends of the cells; however, close inspection shows some which also have central nodules. In the background are the type of curved bacilli from which the aggregations develop. Note also that the swelling process causes the cells to become straight; this suggests an increase in turgor. 1000x.
c) At the lower left is seen the beginning of membrane formation (arrow a). Note that most, but not all, of the peripheral bions are connected, i.e., the membrane is incomplete. Fusion or coalescence of the interior bions is also evident. At the upper right (arrow b) is a formation in a more advanced state; here the membrane is complete and taut. There is now little evidence of the individual bions from which this primal vesicle derived. 1000x.
d) The upper picture shows the appearance of the formation prior to its development into an amoeba with clear cytoplasm. The lower picture shows the mature protozoan in a vegetatively active state. Note the contractile vacuole and pseudopodia. 1000x.
e) and f) These photographs show formations which were found to give rise to amoebae with granules. A mature, active example of this amoeba is seen in the lower photograph in (f). In only one culture did both types of amoebae develop simultaneously—all the remaining Medium 2 cultures produced amoebae with clear cytoplasm. 1000x.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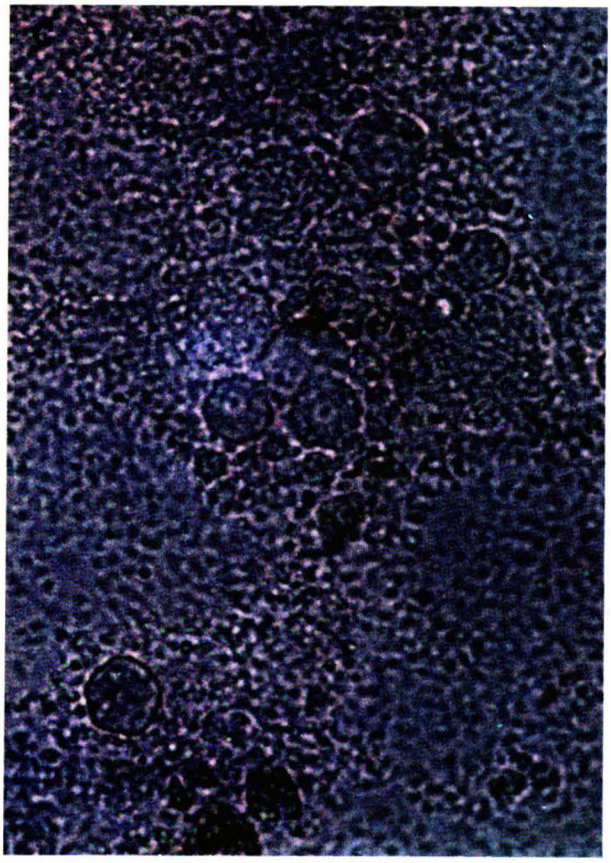

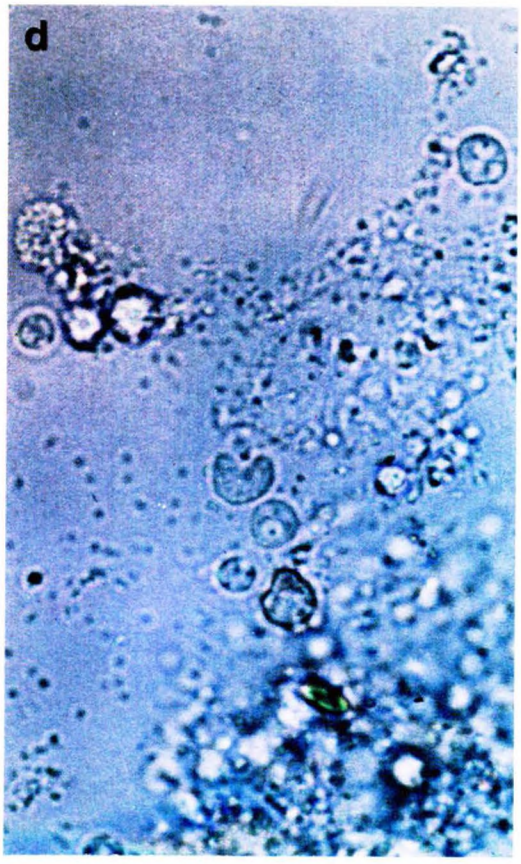
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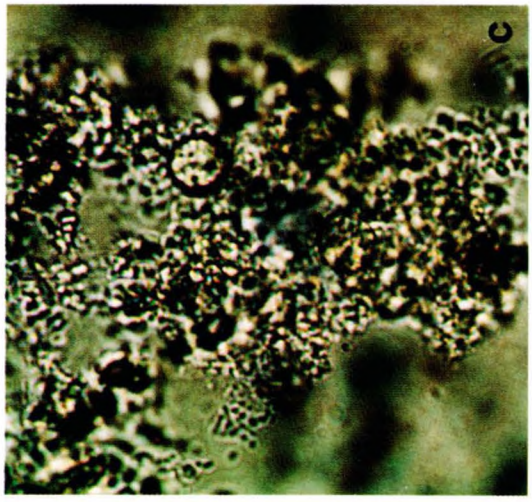
Fig. 4. (opposite page) The formation of amoebae from bacteria in a grass infusion.

a) Note the clusters of bacterial cells which appear to have formed colonies. At the extreme upper right (large arrow), one of these "colonies" has become enveloped in a membrane. In its center a nucleus or vacuole appears to be forming. The smaller arrows indicate "finished" amoebae. 640x. Normarksi DIC.

b) - c) Two views showing primal vesicles and amoebae in various stages of organization. Of particular interest are the different degrees of progress in membrane formation. Close inspection of (c) reveals vacuoles or nuclei (?) developing in the centers of several of the structures. The photographs suggest that the size of the evolving amoebae is related to the size of the cluster from which it derives. 1000x.

d) This photograph shows the remains of a bionous mass after the organisms that have formed in it have begun to move away. Four amoebae are seen just below center; a fifth is visible at the upper right. Near the left margin of the picture three immature formations remain. 1000x.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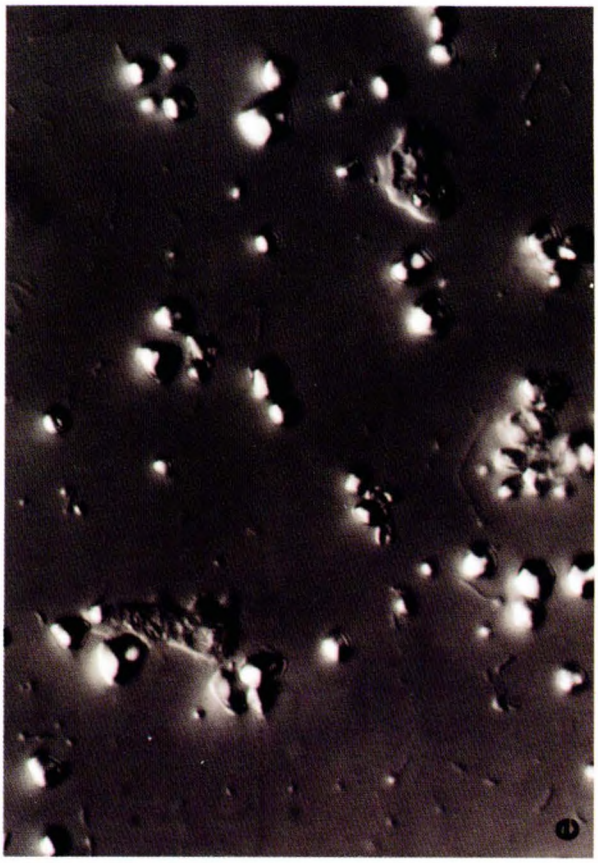
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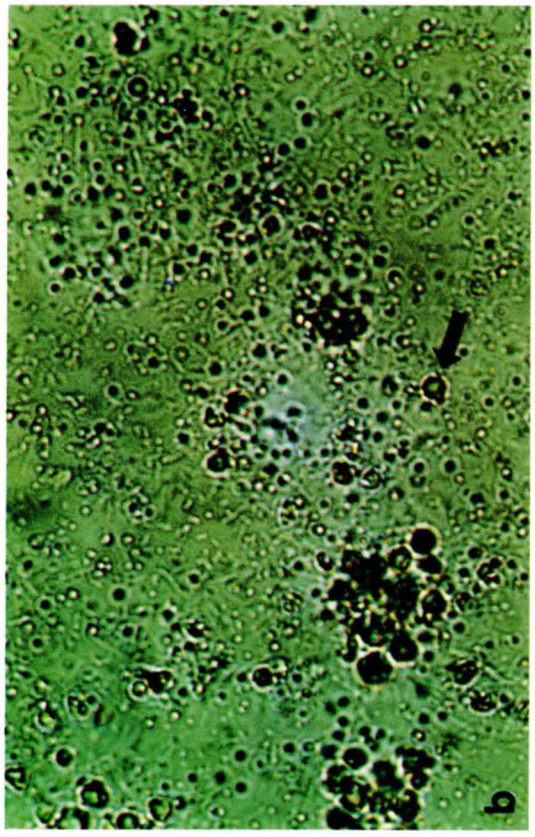
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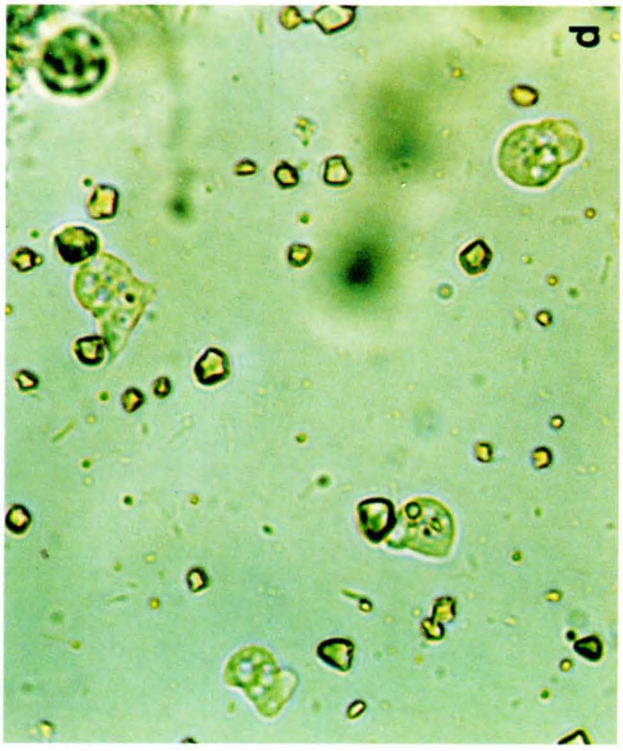
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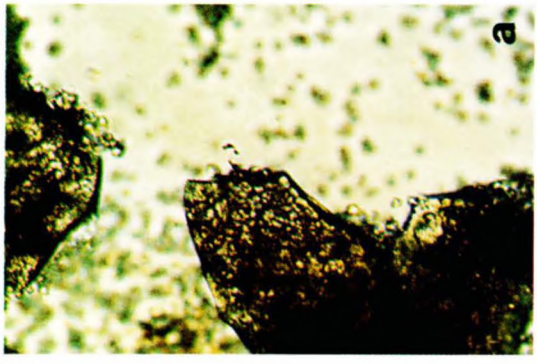
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Fig. 5 (opposite page) The bionous breakdown of the rice and the development of amoeba.

a) Fragments of rice showing their internal structure of many interlocking particles or granules. In the background are individual particles which were broken free in the crushing process. In the infusion they result from the slow mechanical breakup of the rice through the action of water, mold mycelia, and bacteria. 200x.

b) Rice particles breaking down into bions in a culture three months old. Most of the particles have lost their angularity. As the granules swell the bions are produced either from subdivision or budding (arrow). 640x.

c) A bionous mass showing amoebic formations. These masses are indistinguishable from those seen in the grass and other infusions. 640x.

d) Several amoeba from a three month old rice culture from series three. This same species was discovered in a single inoculated rice infusion from the first series of experiments after one year. 640x.

e) Similar organisms seen with the Nomarski DIC technique which reveals additional structural detail. Rice particles are seen throughout the field; a small particle is visible in the food vacuole of one of the amoebae. 640x.

Effect of the Orgone Accumulator on Potato and Onion Plants

H. J. CLAYMOND, M.S.*

Abstract

This paper reports on five years of experiments using potato tubers and two years using onion sets to determine the effects of ORAC charging on plant growth and yield. Although a response to ORAC charging was not found in every growing season, the results of the experiments provide evidence that the ORAC may affect plant growth and yield. The effects due to ORAC charging were generally beneficial; however, a negative effect on onion growth and yield was observed in one growing season.

Introduction

Plants provide an excellent biological model for experimenting with the orgone accumulator (ORAC), and their seeds have been used in several investigations (1,2,3). In studies of my own, I have found by working with various plant species that the potato and onion provide several advantages as experimental materials for use in the ORAC. From a practical standpoint, potato tubers and onion sets are large when compared to most seeds. Their large size readily fills the space inside the ORAC, and at harvest time, they provide a yield that is easily measured. Another advantage is that they mature in a single final harvest rather than through a succession of many harvests requiring multiple determinations. The major reason, however, that I decided to experiment with potatoes and onions is that, in comparison with most other agricultural propagates, they have a large supply of reserve materials and water. Because of this, they are especially able to start their vital activity and to react to environmental influences, such as ORAC charging, before planting.

The purpose of this investigation was to examine the effect on growth and yield following ORAC charging of potato tubers and onion sets. The results of experiments carried out over a period of six years are presented.

Materials and Methods

The ORACs were constructed of alternating layers of organic and metal materials. The type and shape of ORAC used in the experiments varied from blankets to cylinders or cubes. The volume of the ORAC was chosen such that the plant material to be charged would fully occupy the space inside. Whenever possible, the ORACs were constructed on sunny, sparkling days having cumulus clouds with distinct form and structure. Cardboard containers were used in the control treatments.

Since potato tuber or onion set size may be related to individual plant yield, the plant material for use in these experiments was selected to be as uniform as possible. The potato tubers or onion sets were then randomly assigned to the various treatments. The plant material was placed inside the ORAC for charging about one week prior to planting. The daily period of exposure varied from continuous exposure to one-hour exposures. For the part of the day when the plant materials were not exposed to the ORAC, they were placed in paper bags away from the ORAC. The

*M.S. in Agronomy (pseudonym).

control plant material was handled as similarly as possible, being placed in the control containers at the same time as the treated materials.

Unshaded uniform-looking plots of ground were selected to conduct the field experiments. The onion sets were planted 15 cm apart in the row, with 30 cm of space between rows. In the potato experiments, the tubers were planted 46 cm apart in the row, so that when they were dug for harvest, the yield from each plant could be separated from adjacent plants. A 75 cm spacing between rows was used for potatoes. The potato tubers were planted uncut. Border plants, which were not a part of the experiment itself, were set out around the perimeter of the plots to insure equal competition among all plants.

Plant parameters that were determined in the potato experiments included single tuber weight, number of tubers, total tuber yield per plant, number of vines that developed from each tuber planted, and vine length (measured about 2 weeks after flowering, from ground level to the tip of the tallest leaf). For onions, only individual bulb weight (top removed about 3 cm above the bulb) was determined.

Results from Potato Experiments

The results of experiments conducted in 1981 through 1985 on ORAC charging of potato tubers prior to planting are shown in Table 1.

Table 1: Mean tuber yield and number of tubers per potato plant for 1981 through 1985. Means were calculated from replications of five plants in 1981 and from 15 plants in 1982 through 1985.

Year	Groups	Tuber Yield (g)	Number of Tubers
1981	Control	1320	11.4
	ORAC	1260	7.6
	LSD 0.05	445	3.8
1982	Control	998	9.2
	ORAC	976	8.6
	LSD 0.05	213	1.9
1983	Control	498	6.4
	ORAC (1 hr)	754	10.3
	ORAC (10 hr)	615	8.3
	LSD 0.05	94	0.9
1984	Control	633	7.2
	ORAC	571	7.1
	LSD 0.05	101	1.3
1985	Control	651	10.2
	ORAC	601	9.4
	LSD 0.05	139	2.1

In 1981, five potato tubers were charged continuously for seven days using a 3-fold ORAC blanket constructed of steel wool and plastic. While total tuber yield from the ORAC-treated and control groups was not different, tuber production from the ORAC treatment resulted in a smaller number of tubers but of a larger size. By weighing the largest tuber obtained from each plant, it was found that the mean

weights of the largest tubers were 409 and 288 g (LSD 0.05 = 120)* for the ORAC and control treatments, respectively. A much longer maintenance of green living plant tissue was also observed in the vines of the ORAC-treated potatoes.

The experiment was repeated in 1982 using a 4-fold ORAC blanket constructed of steel wool and plastic. The ORAC charging of 15 potato tubers was continuous for seven days. The treatment did not appear to influence tuber number, tuber yield, or potato vine growth in 1982.

In 1983, a 5-fold ORAC was constructed using a one gallon metal can as the inner layer. The outer layers consisted of 100% wool fabric and steel wool. Soon after the construction of this ORAC, I was impressed by the strength of its energy field when placing my hand inside. Two groups of 15 tubers each were treated for a one- or 10-hour charging period each day for a period of 10 days. The results showed a 50% and 23% tuber yield increase over the untreated control group for the one- and 10-hour ORAC treatments, respectively. Tuber number was also increased by the one- and 10-hour ORAC treatments. Thus, the higher yield resulted primarily from a greater number of tubers produced per plant. Since the highest tuber weights were also found in the ORAC-treated groups, increased tuber size also may have contributed somewhat to the yield increase. There were also visible differences between the groups in the fullness of the plant canopy. Potato vine lengths measured from ground level to the tallest leaf were 76, 83, and 80 cm (LSD 0.05 = 5), and the number of vines that emerged from each tuber planted was 2.5, 3.5, and 3.3 (LSD 0.05 = 0.8) for the control, one-, and 10-hour ORAC treatments, respectively. In spite of drought stress, a much longer maintenance of green living plant tissue was again observed in 1983 for the ORAC-treated potatoes. These observations seem to suggest that the increased tuber yields due to treatment may be related to greater expansion and improved maintenance of the plants' photosynthetic capacity. The greater responsiveness shown for the one- over the 10-hour ORAC treatment groups for all of the parameters examined indicates that a short period of exposure was more beneficial than a long period of exposure.

In 1984, a more elaborate experiment was conducted using 2-, 4-, and 6-fold ORACs constructed like the one used in 1983. The experiment also included one- and 10-hour ORAC exposure periods. No differences were found that correlated with ORAC exposure time or to ORAC fold number; therefore, only the overall means for the control and ORAC treatment are presented in Table 1.

In 1985, a 12-fold ORAC was constructed using galvanized steel buckets and plastic. Potato tubers were exposed to the ORAC for an average of 3.5 hours per day for six days. No response to treatment was observed.

Results from Onion Experiments

Experiments were conducted in 1985 and 1986 on the ORAC charging of onion sets prior to planting.

In the 1985 experiment, 60 onion sets were exposed continuously for four days inside a small 2-fold ORAC constructed of galvanized metal and plastic. This smaller ORAC containing the onions was then placed inside a larger 4-fold ORAC of the same construction materials. Before planting, the treated and control onions were each split into two groups of 30 onion sets each. The treatment design consisted of factorial combinations with and without

* LSD 0.05 = least significant difference, at the 0.05 level of confidence.

fertilizer* or ORAC exposure. The results are shown in Table 2. The ORAC treatment resulted in numerically greater yields for both fertilized and unfertilized onions; however, the results were not statistically significant. The interaction between fertilizer and ORAC treatment was also not significant; however, yield was increased by the fertilizer. As was observed previously with potatoes in 1981 and 1983, (and also recently reported by Jutta Espanca (1) for tomato plants), there was a longer maintenance of green living plant tissue in the ORAC-treated onion plants. At maturity, 86% of the ORAC-treated plants were still alive, while only 68% of the control plants were alive (LSD 0.05 = 12%). It was also observed that rotten onion bulbs at harvest time were more common among control plants.

In the 1986 experiment, 14 onion sets were charged for one hour daily for 11 days in a 4-fold ORAC constructed of galvanized sheet metal and plastic. Mean bulb weights were 23 and 31 g (LSD 0.05 = 6) for the ORAC and control groups, respectively. At maturity, the treated plants were almost completely dead, while over 50% of the control plants were still alive. These results seem to indicate that the ORAC treatment adversely affected both onion yield and survival of the onion plants to maturity.

Table 2: Mean onion bulb weights from a factorial combination of fertilizer and ORAC charging.

Group	Mean Wt. (g)
ORAC + fertilizer	65
Control + fertilizer	58
ORAC + no fertilizer	52
Control + no fertilizer	48
LSD 0.05	10

* A complete garden fertilizer.

One possible explanation for these negative results may be that the ORAC chargings were carried out under Oranur or DOR conditions. The chargings began May 11, 1986, just a few weeks after the start of the Chernobyl nuclear power plant disaster.

Summary

From several years of experiments on the use of the ORAC for charging potato tubers and onion sets prior to planting, it appears that under certain conditions the ORAC may significantly influence crop yield. Although yield was affected by the ORAC in only one year out of five for potatoes, and in one year out of two for onions, it appears that other plant parameters, such as the death rate of the maturing annual plant, were more frequently influenced. However, before generalizing about the effects of the ORAC treatment of plants, one must exercise caution in recognition of the fact that, in these experiments, procedures varied between years, as did experimental conditions, such as locations and weather events. In addition, it seems appropriate to interject here that the response of crops to many established cultural practices, such as tillage or the addition of plant nutrients, also varies considerably over the years. Through many years of study, agronomists have gained a fairly good understanding of the reasons for a particular crop year response to a given cultural practice. Thus, it would seem likely that further experimentation with the use of the ORAC on crops over many years will provide insight into the variable nature of crop responses to it. It seems worth noting that the most positive results on plant growth were obtained in 1983 from an ORAC with a very strongly felt orgone energy field. In other years, the energy fields of the ORACs used were less strongly felt. This may indicate that the functioning of the ORAC at the time of the charging of the plant material is very

important to the results obtained. In future experiments, greater attention should be given to factors that are likely to influence the ORAC's effectiveness, such as weather conditions. Information is also needed on the influence of different time durations of ORAC exposure, construction materials, fold number, and the growing conditions of the plants following treatment.

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Erythrocyte Sedimentation: A New Parameter for the Measurement of Energetic Vitality

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Abstract

The following study introduces a new parameter, the Sedimentation Index, for the measurement of energetic vitality. The procedure that measures it was patterned after the conventional laboratory test known as the Erythrocyte Sedimentation Rate and has an advantage of being easily quantifiable. Over a four-year period, 1,100 patients with a wide range of pathology were studied by correlating their sedimentation indices with their energetic appearance and clinical diagnoses. The results of the research proved to be statistically significant.

Introduction

Over the years, the microscopic version of the Reich Blood Test (RBT) has proven to be an excellent indicator of the biological vigor of the organism (1). In addition, recent developments in the quantification of the test have provided us with helpful information regarding the nature and function of disease (2). There is, however, a technical drawback in that the performance of the test requires considerable training and experience.

In an attempt to address this problem, a study was undertaken to explore the possibility of developing a simple, quantitative, macroscopic blood test that could measure one's energetic vitality. The yardstick used to gauge the accuracy of the study was the same as that set forth by Drs. Baker, Dew, Ganz, and Lance in their article on the RBT (1:214-215), i.e., that all patients with active, serious, documented pathology, and who looked seriously ill, had poor test results.

Data from over 1,100 patients reveals a very high correlation between the above-mentioned clinical yardstick and the conventional laboratory test known as the Erythrocyte Sedimentation Rate (ESR).

What is the ESR?

The ESR is a measurement of the suspension-stability of the blood, i.e., the capacity of the Red Blood Cells (RBCs) to remain equally distributed in their own plasma, once the blood has been removed from the body. Basically, the ESR is measured by placing a given quantity of anticoagulated blood into a long glass tube and recording the distance the RBCs fall at the end of an hour. The test is categorized as a nonspecific one because of its inability to diagnose specific diseases, but it does have the capability of detecting the general presence of pathology. More often, medical practitioners use it as a prognostic tool in monitoring the activity of various inflammatory and degenerative conditions. In general, a slower ESR (i.e., shorter distance of fall) is associated with health; a faster test correlates with pathology.

History

The origin of the ESR dates back nearly 2,500 years to the age of humoral medicine, when blood-letting was the most common form of medical treatment. It was well

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known that "shed" blood from severely ill persons differed dramatically from that of normal people. Normal blood that was collected in vessels developed a uniform clot, whereas pathological blood seemed to "secrete" a solid, whitish substance which collected at the top of the "blood cake." This curious material was termed the "buffy-coat," and the blood containing it was referred to as "sizy" blood.

During that era, the belief was that all matter (both living and dead) was composed of four basic elements: air, water, fire, and earth. It was also felt that these elements mirrored themselves in the body in the form of four basic fluids, or humors; these included the blood (air), the phlegm (water), the yellow bile (fire), and the black bile (earth). The reasoning at that time was that the "buffy-coat" indicated the presence of an excess of the humor known as the "phlegm" and that this lay at the basis of most disease. In the belief that bloodletting rid the body of the "phlegm," its practice continued for centuries as the major remedy.

It was not until 1772 that the first breakthrough was made regarding the nature of the "buffy-coat." Hewson identified it as "coaguable lymph," or fibrin (2). Fibrin is the coaguable form of the molecule fibrinogen and is responsible for the clotting of the blood. Hewson attributed the nonuniformity of the blood clot not to an *excess* of the fibrinous material, but rather to its maldistribution, which he felt was caused by an increase in the sinking velocity of the RBCs.

Nasse broadened our understanding of this phenomenon in 1836 when he observed that the RBCs had a tendency to form clusters which, being greater in size and weight than individual cells, fell rapidly through the plasma (3). This tendency to aggregate is known as *rouleaux-formation* and is distinct from coagulation. In coagulation, the RBCs stick together by random contact, and the process is considered chemical in nature; in rouleaux-formation, however, the cells are attracted to each other as if by some "mysterious" force, and line up in an orderly fashion along their broader sides; the formation resembles a stack of coins, hence the French term *rouleaux*.

In 1921, a major milestone was reached concerning the nature of rouleaux-formation when Robin Fahraeus wrote the definitive monograph on the ESR (4). In addition to providing an objective means of quantifying erythrocyte sedimentation, Fahraeus isolated the rouleaux-forming factor in the plasma by substituting healthy RBCs in pathological plasma, and vice versa. It was found that the healthy RBCs formed large rouleaux and sedimented quickly in pathological plasma, whereas pathological RBCs sedimented slowly in healthy plasma and formed only small rouleaux. This led him to the understanding that the RBCs played only a passive role in the process of sedimentation.

The Conventional Theory

Although thousands of papers have been written on the ESR, our understanding of the phenomenon has remained essentially unchanged since Fahraeus's time. He discovered that, in certain disease conditions, there is an increased concentration of various positively charged, asymmetric macromolecules in the plasma, chief among which are fibrinogen and gamma globulin. The fact that these molecules carry a positive electrical charge is crucial to the comprehension of the rouleaux-formation.

In healthy blood, the RBCs normally circulate individually and have a natural tendency to repel each other. The repulsion

is attributed to a strong negative electrical charge on the surface of the RBC (approximately -20 millivolts) which is referred to as the *Zeta Potential* (ZP). If the ZP is attenuated in such a way that the charge becomes less negative and the cells' surface tension is reduced, the repulsive forces are weakened and facilitate the aggregation of the RBCs. The lower the ZP, the larger and more cohesive the aggregates become, and thus the faster the ESR.

As one can see, the presence of positively charged macromolecules could easily account for the formation of rouleaux in that their charge would tend to lower the ZP. The explanation, however, is not so simple. Some experiments have shown that it is very possible to have an elevated ESR without an increase in any of the macromolecules, while other cases have demonstrated that even a reduction in albumin, for instance, may lead to an increased ESR. These findings suggest that different molecules have different effects on the ESR, rather than there being a single, causal relationship. To date, an exact, linear relationship between these macromolecules and the ESR has not been established, so the test still remains something of a hematological enigma.

Because of the relationship that exists between the RBCs' surface charge and the ESR, it was felt that the Zeta Potential might be representative of an orgonotic potential. As a result, a decision was made to explore the possibility of the ESR being an indicator of the biological vitality of the organism. As we shall see, the results proved to be significant.

Conventional ESR Method

There are two basic techniques used to measure the ESR: the Wintrobe Method and the Westergren Method. The techniques are essentially the same, but in the Westergren Method, a 200 mm-long tube is used with a liquid anticoagulant, and in the Wintrobe Method, a 100 mm-long tube is used with a dry anticoagulant. Since the Westergren Method is sanctioned by the International Board for the Standardization of Sedimentation Rates, this method has been used as the reference throughout the present study.

In the Westergren Method, 4 cc of venous blood are drawn and mixed with 1 cc of a liquid anticoagulant, usually a sodium citrate solution or EDTA. The blood is then placed into a 200 mm-long glass tube (with 1 mm divisions), and put into a sedimentation rack which keeps it at an exact 90° angle.* The inner diameter of the tube is 2.5 mm. ** At the end of an hour, a measurement is taken, and the distance to which the RBCs have fallen is considered to be the ESR. The test is performed at room temperature within a period of no more than two hours after obtaining the blood, and no "correction" is made for the patient's hematocrit (HCT).

Modifications of the Westergren Technique Used in the Present Study

The Westergren method was found to be lacking in its ability to characterize fully the entire sedimentation process and, as a result, a number of modifications were made.

The angle of measurement and the inner diameter of the tube were the same as those used in the Westergren Method. Arterial blood was used, rather than venous, only because it was more readily available in the

* The reason that the tube must be kept at an exact 90° angle is that a deviation of as little as 3°, for example, can alter the ESR by as much as 30%.

** The reason to have the inner diameter no less than 2.5 mm is because anything smaller may cause friction at the blood-glass interface, thereby retarding the ESR.

clinical setting.* Instead of the Westergren tube, a Wintrobe tube was utilized, the advantage being that the shorter tube not only speeds up the sedimentation process, but also requires less blood. As long as the entire sedimentation process is recorded, there is no disadvantage in using a shorter tube; the dynamics of this will be explained later. The ESR was measured immediately, rather than allowing for a period of up to two hours; it was felt that this would reduce any extraneous factors that might alter the ESR.

The first significant modification was to measure the ESR at 37°C using a circulating water bath. The reason for this was threefold: one was to keep conditions as close to physiologic as possible; the second was to maintain a constant temperature for all samples; and the third was a practical advantage, in that the ESR proceeded more quickly, due to the higher temperature.**

A second major modification was the use of dry, crystalline heparin as the anticoagulant (rather than a liquid) to maintain the viscosity of the plasma. Although the use of a liquid anticoagulant (in the conventional method) is a constant for all samples, the fact remains that it *does* dilute the blood, which leaves open the possibility of disturbing the natural mechanisms of rouleaux-formation.

The most important modification that was made concerns the way in which the ESR is recorded. In the conventional test, because only one measurement is made at the end of an hour, one could easily assume that the RBCs fall at a constant rate for the entire period of sedimentation, but such is not the case. Figure 1 shows that the sedimentation process actually consists of three phases.

The first phase we call the "Period of Aggregation." During this phase, the freshly removed RBCs begin to form rouleaux that eventually grow to a peak size and cohesiveness.*** In our second phase, which we term the "Period of Most Rapid Fall," gravity overtakes the aggregates and they begin to fall rapidly through the plasma. In our third and final phase, the "Packing Phase," the aggregates begin to lose their velocity and pile up at the bottom of the tube.

Figure 2 shows that it is possible for two different blood samples to fall to the same point at the end of an hour, but how they get there, qualitatively speaking, may be very different. In the case of blood A, the Period of Aggregation is short, the rouleaux fall very rapidly through the plasma, and the Packing Phase is lengthy; whereas, in blood B, the Period of Aggregation is lengthy, the RBCs fall at a slower, steadier rate, and the Packing Phase is short. As one can see, the very essence of the sedimentation process may be overlooked if one includes all three phases in one measurement at the end of an hour.

Inasmuch as the Period of Aggregation is mostly a formative stage and that the Packing Phase takes place when the sedimentation process is essentially over, the parameter that best represents the ESR is the Period of Most Rapid Fall. This is the "heart" of the test. To quantify the Period of Most Rapid Fall, the sedimentation tube is filled to a height of 100 mm, measurements are taken every five minutes, and the consecutive ten-minute period during

* The performance of nearly 100 side-by-side tests using arterial and venous blood demonstrated no significant difference between them.

** It is well known that any increase in temperature will cause an elevation of the ESR, while cooler temperatures retard it.

*** If rouleaux have already formed while in the body (5:431-440), they will grow to an even larger size (due to a further lowering of the ZP) once removed from the body.

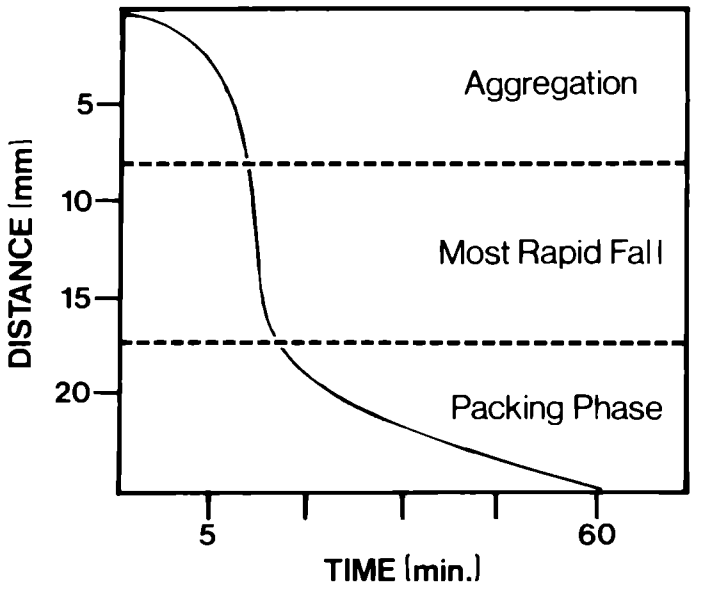


Fig. 1. Representative sedimentation curve, showing the three phases of the process.

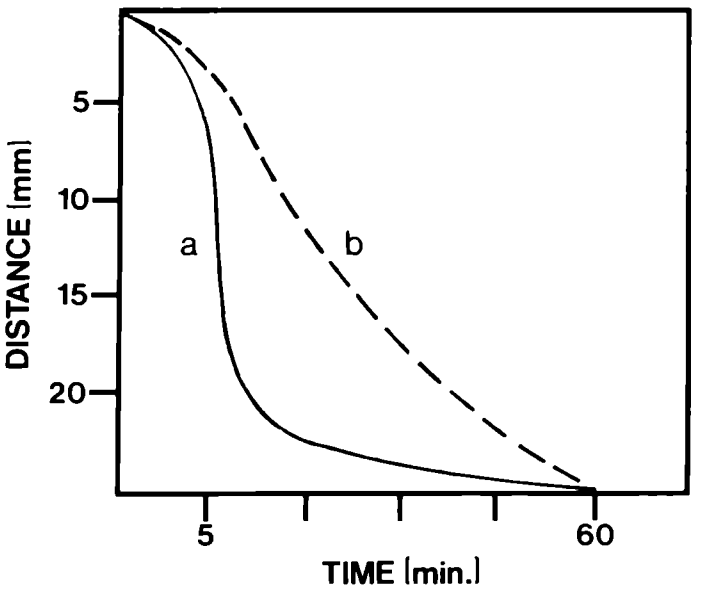


Fig. 2. Two sedimentation curves with the same end points but representing qualitatively different processes.

which the fall is the greatest is selected. This measurement represents the steepest slope of the ESR curve and was termed the *Maximum Distance of Fall* (MDF). Although the increments on the sedimentation tube are 1 mm apart, the measurements are extrapolated to the nearest half millimeter.

The final consideration was whether or not correction for the hematocrit (HCT) is necessary. The HCT is the percentage of RBCs in the whole blood, and while it is not directly connected to the formation of rouleaux, its mechanical presence has a definite effect on the outcome of the ESR. In general, the higher the HCT, the lower the ESR, and vice versa; a higher percentage of RBCs provides a greater resistance to the upward flow of plasma, which in turn retards the process of sedimentation. This explains why the normal values for men and women differ; the ESR in males is lower because the HCT is higher. In judging this mechanism, it became apparent that it *is* necessary to take the HCT into consideration because of its potential to produce anomalous results. For example, if a patient with an anemia (low HCT) has small rouleaux, whereas another patient with a normal HCT, and more serious pathology, has larger rouleaux, then it is entirely possible for their ESRs to be identical. One must have some way of differentiating them.

Scholars of the ESR have tried repeatedly to devise some way of correcting for the HCT; charts have been constructed, formulas have been created, and proposals have even been put forth to remix all blood samples to a constant HCT, but so far, none of the attempts has been satisfactory.

The reason for the failure is that Erythrocyte Sedimentation is not just a strict rate of fall, but instead is the rate of fall in relation to the patient's HCT, and should be expressed as a *proportion* between the two—not as a *corrected* rate. To accomplish this, we divide the Maximum Distance of Fall (MDF) by what we term the Potential Distance of Fall (PDF) of the RBCs, and express the ESR as a percent. To quantify the PDF, we simply subtract the %HCT (in mm) from the height of the sedimentation tube. (For example, if a patient has a HCT of 30%, the RBCs have the potential of falling a distance of 70 mm in a 100 mm tube.) By so doing, we have created a formula that not only makes an allowance for the HCT, but accurately describes the sedimentation process as well. We call this new parameter the *Sedimentation Index (SI).*

Materials

1. Circulating water bath. Braun Thermomix Model 1420, or equivalent. The bath basin should be made of clear plastic.
2. Custom-made platform to support water bath, with adjustable screws capable of keeping water bath level.
3. T-bracket of rust-resistant material capable of supporting sedimentation tube below water level.
4. Centrifuge with adaptor for spinning down the blood to measure the HCT.
5. Two-way carpenter's level or circular level.
6. 3 cc plastic syringes coated with dry crystalline heparin.
7. Needles (minimum 22-gauge) to draw blood.
8. 4"-long, stainless steel hypodermic needles for filling sedimentation tubes.
9. Dade Wintrobe Sedimentation Tubes, 100 mm long with 1 mm increments.
10. Small rubber bands to secure sedimentation tube to T-bracket.

Methods

The circulating water bath is placed on the platform and set at 37°C. (See photo of

water bath). A 22-gauge needle is attached to a 3 cc syringe coated with dry crystalline heparin, and approximately 2 cc of either venous or arterial blood is drawn.*

Once the blood is drawn, a 4" stainless steel hypodermic needle is attached to the syringe and a Wintrobe sedimentation tube is filled to the 100 mm mark. Great care should be taken that there are no air bubbles anywhere in the blood column.** If more than a few minutes pass before the blood is placed into the tube, the sample should first be shaken vigorously for at least 30 seconds.

After the sedimentation tube is filled with blood, it is secured to the T-bracket. (See photo of T-bracket.) The top part of the bracket can be made of any material, as long as it is heavy enough to resist the circulatory movement in the water bath. The bottom part of the T is made from the ruler of a metal T-square; the ruler already has a groove cut into it, which is the exact width needed to hold the sedimentation tube. If the ruler is painted white, it provides a better background for observing the plasma-RBC interface. It should be cut down to a size about 2" from the bottom of the water bath, and then secured to the top part of the T-bracket at an exact 90° angle. To attach the sedimentation tube to the T-bracket, one simply puts the tube into the groove and secures it with a small rubber band.

The entire assembly is then placed across the top of the water bath, with the tube low enough in the water bath to have the blood column completely submerged, but not so low as to allow the bath water into the tube. At this point, the water bath is leveled with the adjustable screws.

Obtaining the Reading

To obtain the HCT necessary for the calculation of the SI, one must have a centrifuge with an adaptor to spin down the blood in the Wintrobe tube, or have an equivalent adaptor for a capillary tube. If a centrifuge is not available, but it is possible to obtain a very accurate hemoglobin value, this value may be multiplied by three and substituted for the HCT; this method also gives acceptable results.

The lowest part of the plasma-RBC interface is the point where the measurement is taken for ESR readings. In cases of very rapidly sedimenting bloods, where the interface is blurred, one takes the reading closest to the darkest portion of that interface. In general, the test is over within 30 to 40 minutes.

To obtain the SI, the following formula is used:

$$\frac{\text{Maximum Distance of Fall (MDF)}}{\text{Potential Distance of Fall (PDF)}} = \text{Sedimentation Index (SI\%)}$$

Where: MDF = Greatest distance of fall within any given consecutive 10-minute period, with measurements made every five minutes. MDF is expressed in mm.

PDF = Height of the sedimentation tube (100 mm) less the %HCT, expressed in mm.

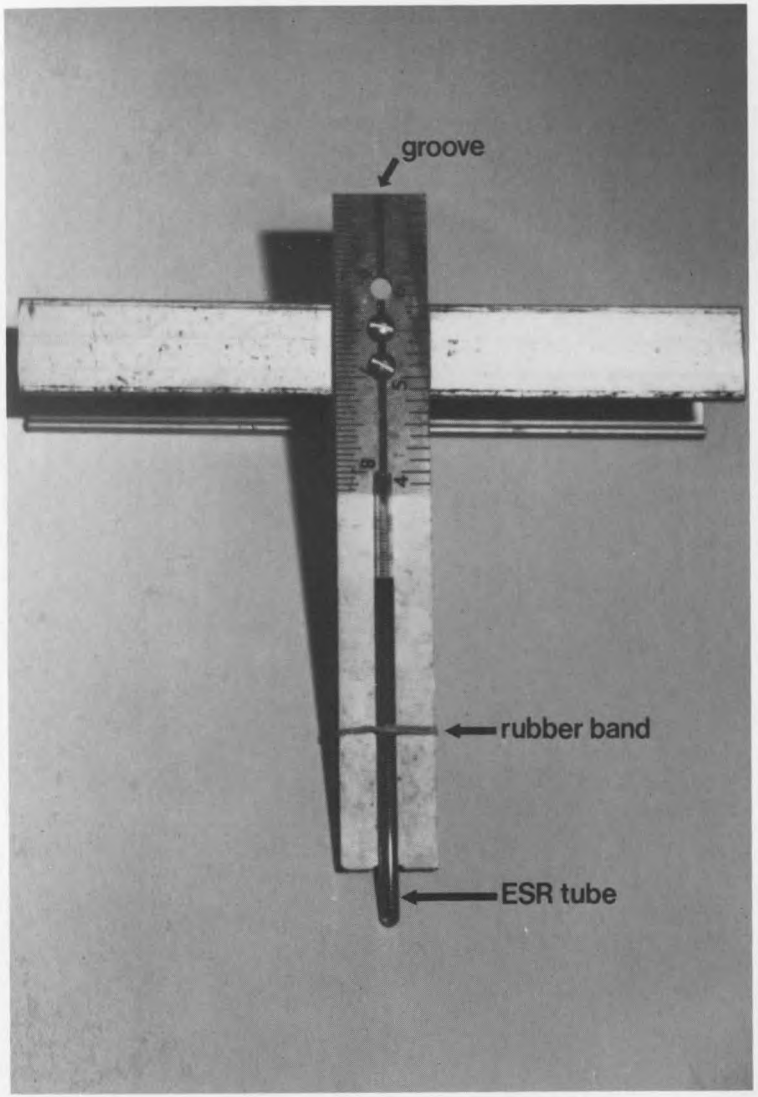
Example: If MDF is 14.0 mm and HCT is 30%, then:

$$SI = \frac{14.0 \text{ mm}}{100 \text{ mm} - 30 \text{ mm}} = \frac{14.0 \text{ mm (MDF)}}{70 \text{ mm (PDF)}}$$

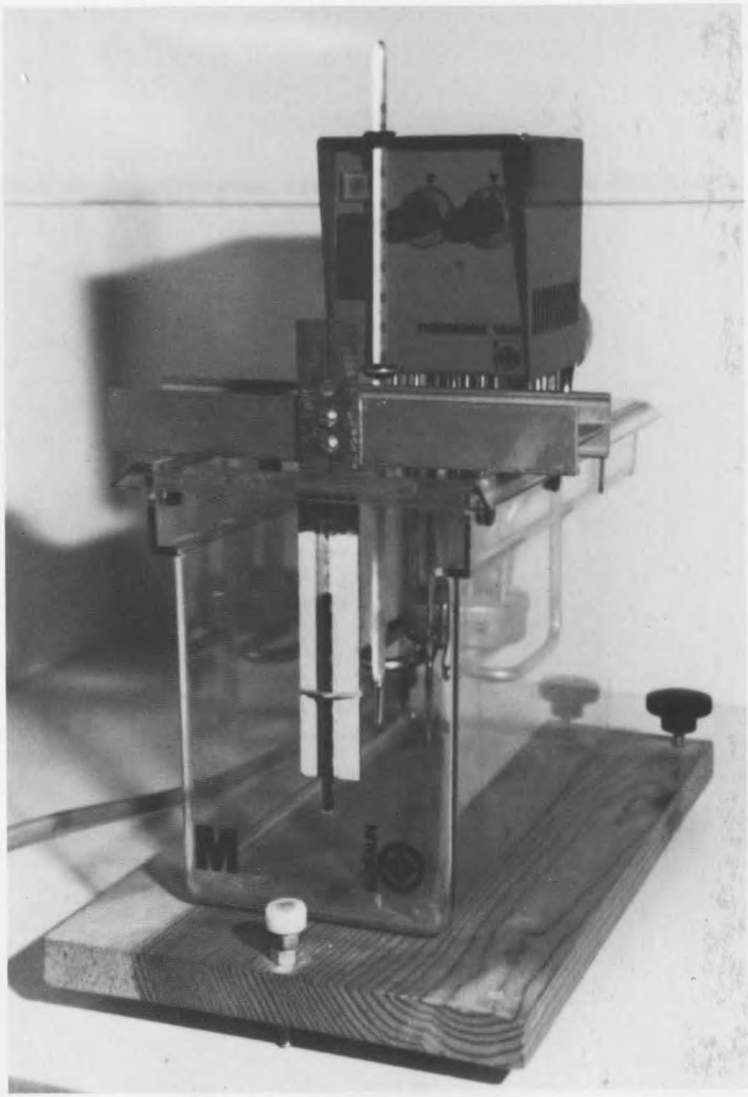
$$= .20 \times 100 = 20\%$$

* If arterial blood is to be used, precoated arterial blood gas syringes are available that allow the blood to fill passively.

** This is accomplished by inserting the needle to the bottom of the tube before ejecting blood from the syringe.



T- Bracket



Water bath with bracket in place

Patient Categories

Eleven hundred patients were studied from the general population of a large metropolitan hospital. Of the 1,100 patients tested, only 960 are discussed, since a different technique was utilized early in the study. The newer method, which we have adopted as standard, was chosen because of its increased sensitivity to SIs over 25.*

It should also be noted that of the 960 patients studied, 142 of them had diagnoses that were in question or not fully documented. As a result, none of them has been used in the statistical studies involving the pathological categories, but they were included in those studies involving energetic appearance. Of these 142 cases, 93 had suspected cancerous lesions.

Patients were divided into four energetic and four pathological categories, and the results were correlated with their SIs.

In addition to putting the disease conditions into general categories, when there were more than six examples of any type of pathology, a separate category was created, and the patient's energetic appearance was correlated with the SI. If there were less than six examples, or if the patients had a combination of pathologies in which none was dominant, they were put into a miscellaneous category. These categories are shown in Tables 1 and 2.

A. The Energetic Categories

The four energetic categories were:

E = Energetic: Patients in the E category were people who appeared radiantly healthy; in general, they had clear, sparkling eyes, their skin was warm and moist to the touch, they had excellent color, and moved in a lively manner.**

B = Borderline: Patients in the B category were those who did not appear frankly ill, but neither did they have the appearance of those in the E category. The eyes appeared less clear and sparkling; the skin was drier and cooler to the touch; occasionally, there was a slight greyish pallor; and in general, they moved in a less lively manner.

C = Contracted: Patients in the C category generally had dull eyes; the skin was usually cool and dry to the touch; they had a definite greyish pallor; and they moved in a sluggish manner.

C+= Very Contracted: Patients in the C+ category had eyes that were very dull and often glassed-over; their skin was usually cold and very dry; they had an ashen appearance; and any type of movement seemed to be an effort. In additionl, many of the patients appeared cadaverous.

B. The Pathological Categories

The original intent was to divide the pathologies into distinct, biopathic classifications. Because of the complexity of that task, however, it was decided that four general categories would be created. Cancer was placed in a category by itself, being the only clearly recognizable shrinking biopathy.

The four pathological categories were:

N = Normal: Patients in the N category

* The newer technique demonstrated that in SIs over 25, the values tended to be higher than previously. All other comparable values below 25 showed an exact, linear relationship.

* In those cases of black or Hispanic patients, where the ability to discern skin color was impaired, a greater emphasis was placed on the quality of the eyes and the skin, and the liveliness of their manner.

Table 1: General categories of diseases used in the study

Disease	No. of Cases
Cardiovascular disease	185
Miscellaneous	143
Chronic obstructive pulmonary disease	126
Cancer	121
Possible cancer	93
Normal	47
Asthma	33
Bronchitis	32
Shortness of breath-unknown origin	27
Sarcoidosis	26
Renal disease	26
Morbid obesity	15
Acquired Immune Deficiency Syndrome	13
Pulmonary fibrosis	11
Diabetes	10
Pneumonia	8
Hypertension	7
Scleroderma	6

Table 2: Miscellaneous categories of diseases studied

Amyotrophic lateral sclerosis	Hiatus hernia
Anemia	Hyperthyroidism
Ankylosing spondylitis	Hypogammaglobulinemia
Asbestosis	Laryngeal papilloma
Ascites	Mongoloidism
Brain tumor (benign)	Multiple sclerosis
Cerebrovascular accident	Myasthenia gravis
Cerebral palsy	Narcolepsy
Crohn's disease	Pancreatitis
Cirrhosis of liver	Polycythemia
Common cold	Pulmonary embolli
Cystic fibrosis	Mental retardation
Erythrocytosis	Systemic lupus
Influenza	Toxic fume exposure
Goiter	Tuberculosis
Gout	Ulcer
Heroin addiction	

were symptom-free and had no known pathology in the present, or in the immediate past.

M = Mild: Patients in the M category were those with mild pathology, such as a cold, fever, asthma, headache, etc.

S = Serious: Patients in the S category were those with serious, documented, organic diseases, such as coronary artery disease, emphysema, pnuemonitis, renal disease, liver disease, etc.

CA = Cancer: Patients in the CA category had an established diagnosis of some form of cancer.

Microscopic Examination

Once the patients were categorized, microscopic examinations were made of their whole blood. This was done in order to study the nature of the rouleaux-formation and the energy fields to determine the correlation, if any, with the SI. The information gained from the observations proved to be extremely valuable in lending support for the energetic basis of the ESR.

To perform the microscopic examination, a drop of whole blood is placed between a glass slide and cover slip, with care being taken to obtain a layer of blood only one cell thick. For optimum results, the drop of blood is the average size of that obtained with a 25-gauge needle. A few minutes are allowed for the blood to settle down, and a homogeneous area of the preparation is selected and examined at magnifications of 675x and 2700x. The size, spacing, and cohesiveness of the rouleaux are recorded, as well as the size and luminescence of the energy fields. To test the cohesiveness of the aggregates, pressure is put on the cover slip to determine how easily the rouleaux are dispersed.

Results and Discussion

The statistical results are shown in Table 3. In Figure 3, which plots the SI against the patient's pathology, * a clear pattern emerges, i.e., on the average, the more serious a patient's pathology, the greater the SI. From a statistical point of view, these results are extremely significant; an analysis of variance (ANOVA) was performed, with the resulting p-value being less than 0.0001, i.e., showing that there is very little chance that these two parameters are *not* related. (A p-value of less than 0.05 is normally considered statistically significant.) Figure 4, which plots the patient's energetic appearance versus the SI, shows that the worse a patient looks energetically, the higher the SI. The statistical results were the same, with the p-value being less than 0.0001.

To explore further the relationship between energetic appearance and pathology, the energetic categories were plotted against the pathological categories and both, in turn, were plotted against the SI (Figure 5). As one can see, the results are striking. A set of ANOVA calculations for the Figure 5 data is highly significant (p-value less than 0.0001).

From Figure 5, it is obvious that the worse a patient appeared energetically, and the more serious his pathology, the higher was the SI. Not only did this apply for each general pathological category, but it also applied for all the categories in relation to each other. Looking at the E categories, for example, one can see that even when a patient appeared energetic, if the pathology was more serious, the SI was higher. This follows in a logical sequence in the B, C, and C+ categories as well.

A look at the extremes (i.e., patients in

* Numbers within the bars refer to the number of cases.

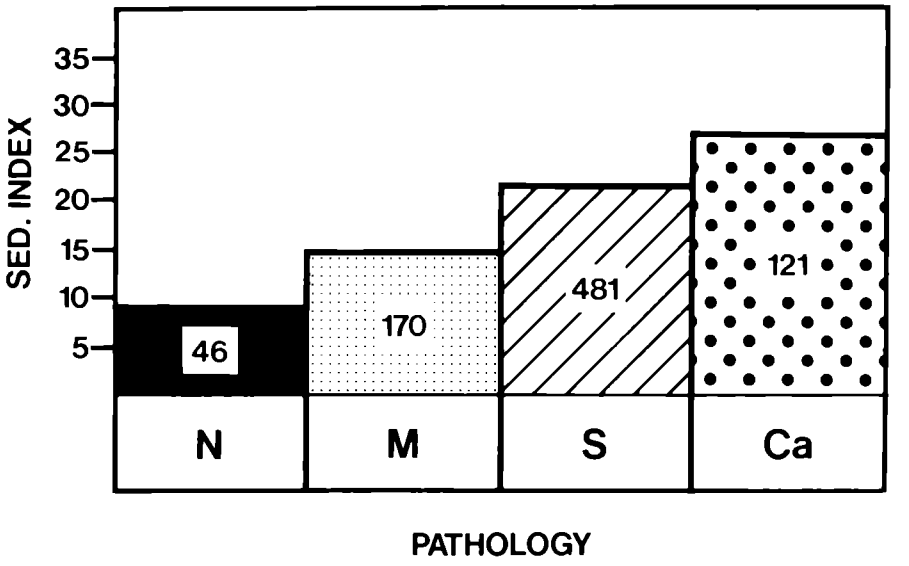


Fig. 3. Histogram of the Sedimentation Index for the four pathologic categories. Numbers in blocks are the number of patients in each group.

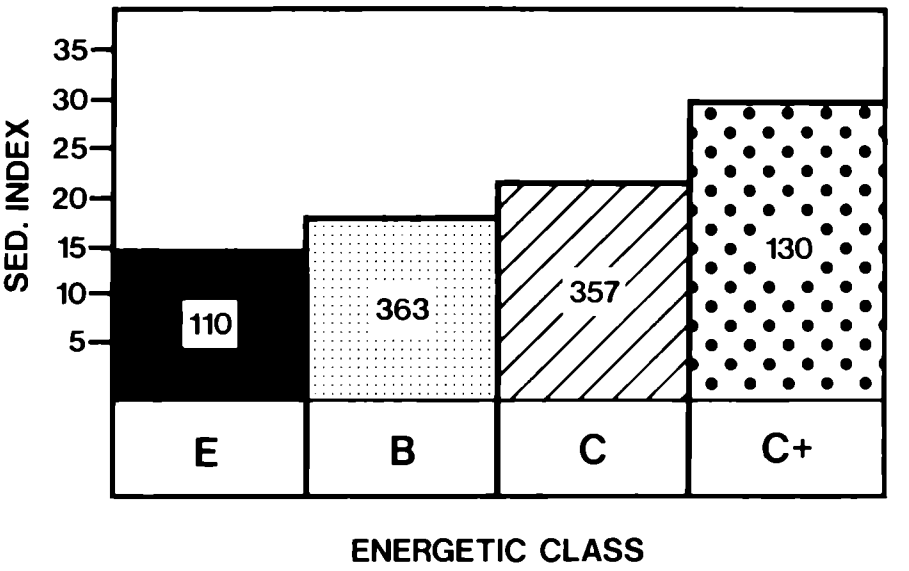


Fig. 4. Histogram of the Sedimentation Index for the four energetic categories. Numbers in blocks are the number of patients in each group.

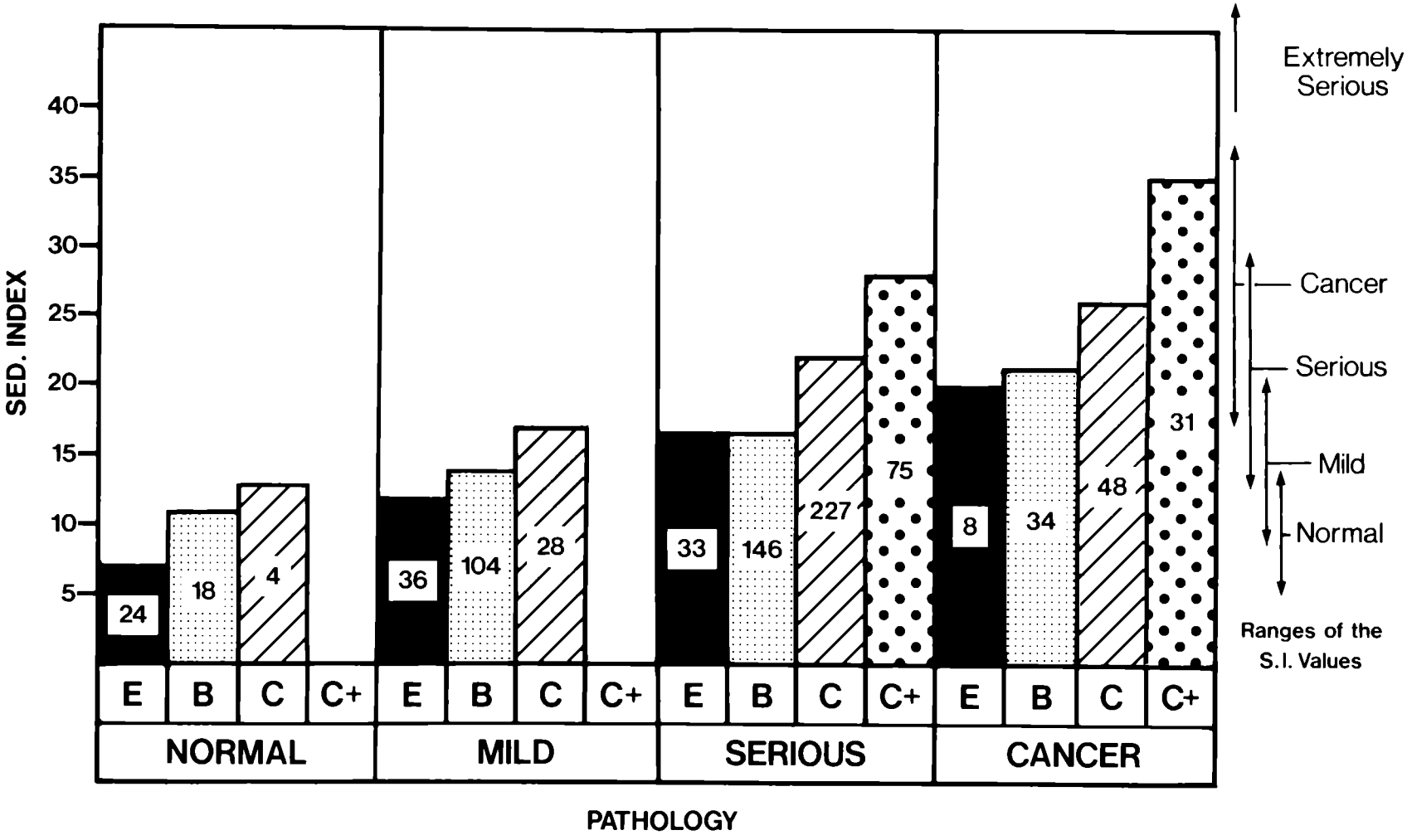


Fig. 5. Histogram of the Sedimentation Index for the four pathologic categories, each with four energetic sub-categories. Numbers in blocks are the number of patients in each group.

the Normal category who looked Energetic versus patients with Cancer who looked Very Contracted) shows a very high correlation in that the former had the lowest SIs and the latter had the highest. An interesting point is that of all the patients in the Normal category, none of them ever appeared Very Contracted. In the Mild category, only two patients appeared to be Very Contracted. These results were not graphically displayed, however, because there were too few cases for a statistical analysis.

As mentioned before, besides putting patients into general pathological categories, individual groups of diseases were studied as well; this was done by plotting the energetic appearance against an individual disease and, in turn, against the SI. The same pattern emerged in all of the groups, i.e., the worse a patient appeared energetically, the worse the SI.

Another significant observation was that in the Normal category the majority of patients appeared Energetic; in the Mild category, the majority appeared Borderline; and in the Serious category, the majority appeared Contracted. The only exception to the sequence was in the Cancer category, where the largest group of patients appeared Contracted, rather than Very Contracted, as one might expect. A possible explanation for this occurence might be that in the present study, no distinction was made as to the extent of the cancer.

In addition to the patterns mentioned above, statistical studies were performed to see if there was any correlation between the SI and a person's age. The results were inconclusive only because of the fact that, the older one gets, the more likely one is to develop more serious pathology; it was found that older patients with no known pathology who looked energetic could have normal SIs, just as younger people who had serious pathology and looked contracted could have high SIs. What this suggests is that when blood is normal, it is normal regardless of age.

And finally, it must be mentioned that there is one physiological condition that is the exception to the rule, and that is pregnancy. It has been well known since the advent of the ESR that, as pregnancy advances, the ESR increases. In this report, only two cases were studied; both women were in their eighth month, and both had SIs over 30. Obviously, a different set of standards needs to be developed for this condition. One should keep in mind, however, that just because pregnancy is the exception to the rule, this does not imply that our assumptions regarding the energetic basis of the test are incorrect; further studies are required to determine how this exception fits into our understanding of the SI.

Table 3: Average SI values for the major pathologic categories.

Category	SI
Normal *	9.6% ± 4.3
Mild	14.4% ± 6.0
Serious	21.2% ± 8.6
Cancer	27.3% ± 10.3

* An unusual group of patients was seen whose SIs were well *above* normal (e.g., SI = 2); all had accompanying secondary polycythemia. Taking into account that the SI makes an allowance for the patients' HCT, it is unlikely that we can attribute this phenomenon to a mechanical factor. One possible explanation for this extreme may be that what we are observing here is some type of overcharge condition, similar to what has been reported in the Reich Blood Test; further study of its mechanism is required, however. In any case, one should not consider SIs well above normal in association with secondary polycythemia to be a sign of excellent health. In this circumstance, the abnormally high SI is indicative of pathology.

Microscopic Findings (Figure 6)

Photo 1 shows that, in healthy blood with a normal SI, the rouleaux appear to be in small chains that are homogeneously distributed in the plasma. Photo 2, which is the same blood at a greater magnification, reveals the energy fields to be bright, broad, and luminescent. When the cohesiveness of the aggregates was tested, it was found that the RBCs in the rouleaux dispersed quite easily and took a long time to regroup.

Photos 4 and 5 show quite a different picture, however. This is a case of a patient with metastatic cancer of the lung with a very high SI. Photo 4 illustrates the clumping of the RBCs into very large aggregates, which results in disproportionately large lakes of plasma. At the higher magnification (Photo 5), the energy fields appear to be thin. With pressure on the cover slip, the aggregates were impossible to break apart.

In every case where the SI was normal, the rouleaux were small and lacked cohesiveness, and their accompanying energy fields were broad and luminescent. In all cases where the SIs were over 40, the rouleaux were large and could not be broken apart, and the energy fields were narrow and lacked luminescence. As for all the "in-between" cases, there was a logical progression, in that the worse the SI became, the larger and more cohesive were the rouleaux, with the accompanying energy fields becoming thinner and less luminescent.

An additional piece of evidence that may lend support to the energetic basis of the SI is shown in Photo 3. A drop of blood from a patient with a normal SI was placed under the microscope, and the rouleaux were broken up in the usual manner. As the RBCs dispersed and began to regroup into rouleaux, six photographs were taken in rapid succession. What was seen (arrow in Photo 3) was that, as the RBCs came into proximity with each other, finger-like extensions reached out to form a bridge between the cells. Once the cells were close enough, they simply slid over each other and lined up along their broader sides to form rouleaux. To rule out the possibility that these bridges might have been a material joining of the cells, the rouleaux were repeatedly broken apart and allowed to regroup, with the end result being exactly the same. This appears to be a *direct visual confirmation of an energetic process associated with the aggregation of the RBCs.**

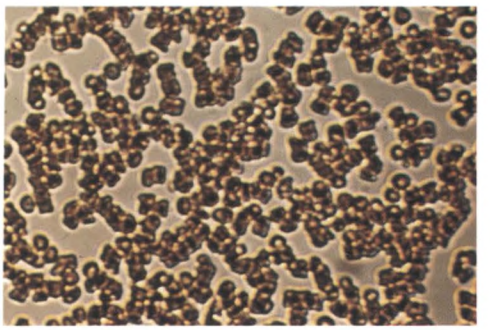
A final correlation of the RBT with the ESR showed that all patients who had active, serious, documented pathology, and looked seriously ill, had poor test results (1:214-215).

Conclusion

The findings of the present study support the hypothesis that the Erythrocyte Sedimentation Rate is a measure of energetic vitality. In general, the worse the patient appears energetically and the more serious his pathology, the more likely the SI will be abnormal. In addition, as a result of modifying the conventional ESR technique, a simple, quantitative, macroscopic blood test has been developed that provides a new parameter for the evaluation of energetic vigor.

In the Reich Blood Test, the focus is on the bionous disintegration of RBCs in a physiological saline solution, whereas the Sedimentation Index focuses on a particular energetic dynamic in the plasma. Therefore, what we are observing may be

* Similar energetic bridges have been described in *The Cancer Biopathy* by Reich in his observation of earth bions and RBCs lying in close proximity (7:35-36). In addition, looking back at the photographs in the original article on the RBT, one can also see these bridges between RBCs (1:204-205).



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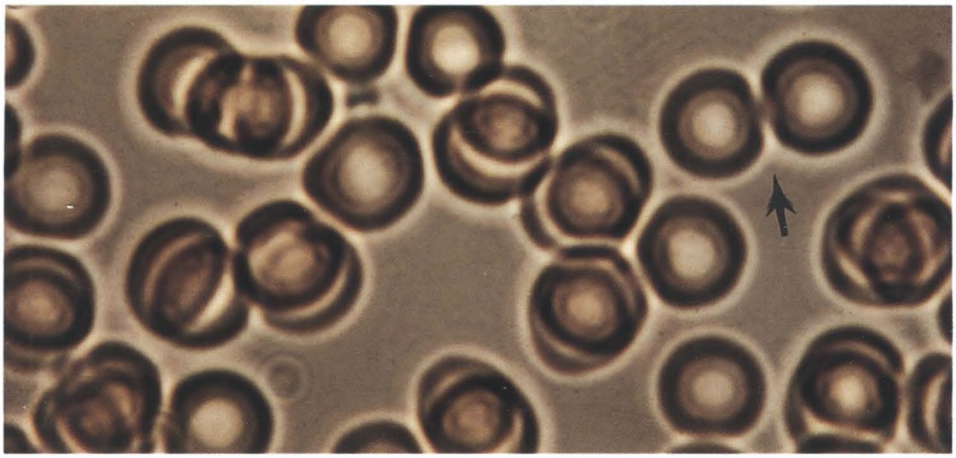

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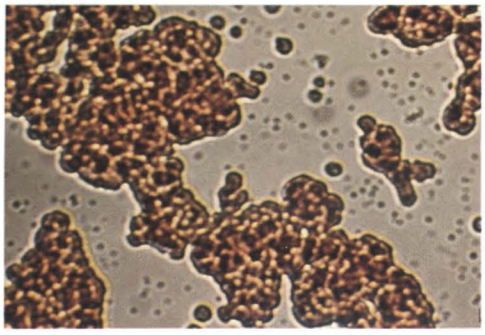

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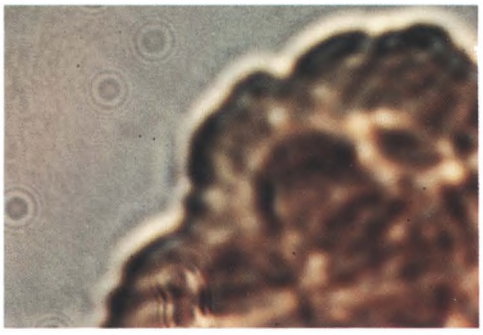

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Fig. 6. The microscopic findings in the red blood cell aggregates.

two different aspects of a common function. In the same way that we usually need a number of tests to make a comprehensive medical diagnosis, it is quite likely that a variety of blood tests will be needed to provide a more complete picture.

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Acknowledgement

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Human Armoring
An Introduction to Psychiatric Orgone Therapy*

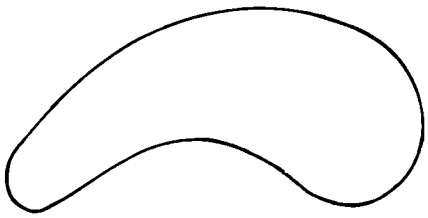
MORTON HERSKOWITZ, D.O.

Chapter 4
The Segmental Armoring

Note: In this and the next chapter, anatomic names have been provided for the medically schooled reader. The lay reader can skim over these names with no loss of comprehension of the material.

Ordinarily in psychiatry, we observe one bit of aberrant behavior in the patient, add it to other bits of aberrant behavior, add those bits of history that give evidence of emotional malfunction; and, comparing our information to the disease entities that have been described, we arrive at a diagnosis. We say cognitive function is disturbed to this extent, affect is inappropriate to this extent, and ideation is altered to this extent; therefore, the patient is suffering from such and such.

Reich's procedure was different. He asked first—not, what is unhealthy, but, what is health? To ascertain the answer to this question, which is such a complex one, we must think back to our lowliest animal relatives and determine whether we can make any generalizations about health and disease in their case. If we experiment with noxious stimuli and hostile environments, we observe that, as the environment begins to affect them, there is a disturbance in their motility that occurs within the confines of the organismic membrane. We have not investigated the chemical or physical changes that may be occurring within the organism; we have only observed grossly. On this basis alone, we can generalize that healthy organisms are more pulsatile than unhealthy ones. In some cases, we may observe that the unhealthy organisms cover a greater distance in a specific time, but there is a frantic quality to this motion and it occurs despite the fact that the organism's own pulsation is decreased. For the purposes of these basic animal observations, Reich reduced all animals, including man, to a protoplasmic, bean-shaped mass confined in a membrane. The cephalic (head) end is depicted as larger, to indicate the increased energies at that end.



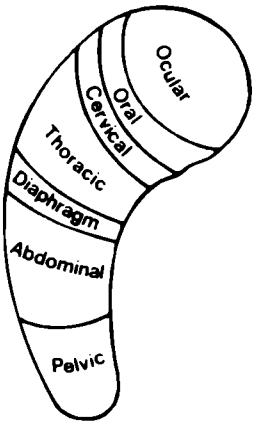
In the case of a one-celled organism, we can observe the organismic pulsation by direct observation. Multicellular organisms are composed of systems of separately pulsating components within the larger unitary pulsation. In the human organism, for example, there is the cardiac pulsation, the pulse of respiration—inspiration and expiration—the peristaltic pulse of the gastrointestinal system, the pulse of the brain,

* The first three chapters appeared in the *Annals of the Institute for Orgonomic Science,* Vol. 3, No. 1, Sept. 1986.

the extensions and retractions of peripheral nerves, etc. Moreover, each individual cell has its own pulsation. And all of this occurs within a large, total organismic pulse. A deficiency of any of the smaller pulses from the cellular to the systemic level decreases the larger pulse. Thus a constipated gastrointestinal pulse puts a damper on the pulse of the total organism. The pulse of a heart with a defective valve clearly affects the energy economy of the organism. On the other hand, if the basic pulse of the total organism is a shallow one, it must reflect on the systemic and cellular pulses within it.

The quality of pulsation, then, is the basic criterion of health or disease. A correlate of the organism's pulsation is the energy field which, in some cases, can be visualized as an aura surrounding the organism. With the development of Kirlian photography (a photographic method in which electrical impulses transmitted through the subject affect the photographic plate without benefit of light, and apparently make the energy field visible), it may someday be possible to ascertain the state of an individual's health by photographic inspection. Until that time, we rely on observing the quality and quantity of energy with which an individual functions, the emotional freedom with which he lives his life.

Having established the significance of free pulsation (the free flow of energy) within the body, Reich discovered that there were seven segments wherein the energy could be blocked by armoring. As regards the potential for armoring, the protoplasmic beanbag can now be shown to be a seven-segmented worm.



Reich defined armor segments as "those organs and muscle groups which are in functional contact with each other which can induce each other to participate in expressive movement." An armor segment is a *functional* rather than an anatomic unit. It corresponds to how emotions are expressed, rather than where nerves, blood vessels, muscles, organs, etc., lie anatomically. Blushing, for example, may be confined to areas of face and neck, not clearly delineated by anatomic structures.

A segment is the smallest unit capable of emotional expression. However, many segments may participate in a larger expression of emotion. For example, on one occasion, one may express one's anger by firing a withering look at the antagonist. In another instance, one may express anger more appropriate to *that* occasion with angry eyes, a roar through a snarling mouth, and pounding fists and kicking feet.

With the exception of the arms and legs, which are appendages of the thoracic and pelvic segments, respectively, armoring always occurs at right angles to the longitudinal body axis. It is at once a hardening

and a tightening which limits the mobility of the affected parts and the free flow of energy along the head-to-toe axis.

The Eye Segment

The eye segment comprises all the structures extending from the scalp to the base of the nose, upper cheeks, and superior edge of the occiput (the occiput roughly comprises the very back of the skull). It contains the preponderance of the body's exteroceptors (the organs that sense the environment): the organs of vision, hearing, and smell; it includes the cerebral hemispheres, the pituitary body with its important hormonal regulatory functions, the pineal gland, the thalamus and reticular formation, which are key emotional regulators. It is because of the tremendous energetic exchange in this segment that we graphically represent the protoplasmic bean as expanded in the cephalic end. From the list of structures included within this segment we can see that the functions served include intelligent action, awareness, concentration, extending outside oneself to experience the world by seeing, hearing, and smelling it, and, on the basis of these perceptions, to regulate the organism's endocrine responses, autonomic functions, body growth, etc. Because the brain and its associated structures are included in this segment, and because there is probably more to be learned about brain functions than is already known, it is something of a black box phenomenon. Unwittingly, when we work on this segment of armoring, we may produce some of the amazing physical changes which we observe in therapy.

For example, a patient in her thirties, who had always had a straight torso and had been nicknamed "slip-hips" by her high school friends when they discovered that she stuffed her skirts with slips to compensate for the lack of the natural feminine pelvic flare, noticed, in the course of her therapy, that her pelvic and hip contours were changing. Amazingly, at this relatively late time of life, she developed secondary sexual contours that she had always lacked. It was impossible for the therapist to pinpoint what therapeutic maneuvers were exactly responsible for this change. But, in the light of recent studies that indicate that variations in environmental light intensity affect the time of pubescence of human females, an effect of a retinal-pineal pathway, it is conceivable that work on the patient's eye armoring had a pineal-stimulating effect that, in turn, resulted in this remarkable physiological change.

Except for the skin sensations and an as yet unexplored awareness of the proximity of objects, which is most acutely developed in blind persons and the psychically gifted (but which is surely natural and not supernatural), the eye segment is the chief locus of all external perception. In dealing with emotional disorders, then, this segment is crucial in phenomena dealing with relationships to other people and to the world. In the extreme examples—hysterical blindness and schizophrenia—the organs may totally fail to perceive. The patient with hysterical blindness, having faced a scene that is too traumatic to be borne by the psyche, becomes functionally blind. The schizophrenic in infancy sent his lively visual energy motherward and, failing to receive her warm visual response in return, learned to avoid the frustration of reaching out and feeling nothing by shutting off in his eyes. His eyes function sufficiently not to bump into objects, but all the lively, emotional uses of seeing are deadened. When he paints, his color intensifies and forms are often exaggerated in an attempt to restore the life that has gone out of his

eyes. When you look at his eyes and attempt to see him deeply, your eyes become unfocused as when looking at rippled water. When you try to make emotional contact, your eyes to his, you look and seek; he is not there. There is only space, and the configuration of an eye. It is interesting to note that a large proportion of the photographers and painters whom I have treated have had significant eye armoring. It would seem that these individuals had developed a work skill involving seeing to compensate for the defective emotional uses of their eyes.

The schizophrenic makes minimal use of his eyes.* He sees only what is necessary for his physical safety and for going through the motions of living, so that he can withdraw his vision to within his skull where living is safer and more pleasant than in the real world.

My treatment room had been windowless, and after several years of working exclusively in artificial lighting, I had the exterior wall replaced with glass brick so that the room was lit by sun on clear days. A schizoid patient who had come regularly since the pre-renovation period walked into the treatment room one day, half a year after the glass bricks had been installed, and said, "Hey, what did you do to this room, it's different." I couldn't imagine how the room was changed since the previous week, and I answered that nothing was different. After an interval, he said, "It's the wall; that used to be a solid wall." For six months, he had worked in a room with natural instead of electrical light, and hadn't seen the difference.

The schizophrenic is an extreme example, but most of us have lost some of the functioning potential of our eyes. As an exercise, patients are sometimes directed to look carefully at the individuals they pass in the street, or at fellow passengers in the bus, and to read the emotions on the faces. Typically, the patient is impatient for his next visit so that he can report his discovery. "They all look mad, or sad, or bored, every one. I never saw that before. It's amazing; I never saw it."

Few of us look at one another, and of those, fewer still look openly and allow our eyes and faces to express what we feel. Mostly we use our eyes as one uses power telescopes to scan our environs. We stand behind the telescope. They can't see *us.*

The extent of the damage that is done to the individual through eye armoring is inestimable. The world experienced by brightly lit, lively eyes is a totally different place from the world viewed by those fortified behind their eyes. We are at the beginning of discovering the price we pay in body functioning for armored eyes. A study** shows that unmothered lambs have a significant deficit in depth perception as compared with their mothered control peers. It is reasonable to expect that in time we shall discover the loss of other physical graces and synchronies, the clumsiness of thinking, acting, and moving that is related to armoring in this segment.

The relationship of the eyes and intelligence has been noted by most of us subconsciously. We look at an individual for the first time and, without benefit of hearing him speak, we note that he looks "bright" or "dull." His conversation may

* A study by Leonard R. Proctor and Dominic W. Hughes in *Science,* Vol. 181, July 13, 1973, indicates that, in a significant number of schizophrenic patients, smooth pursuit eye-tracking patterns "differ strikingly" from that of normals and non-schizophrenics. The probability of a perceptual dysfunction in schizophrenia is thus established outside of the treatment room.

**Lennon, Wm., and George H. Patterson: "Depth Perception in Sheep: Effects of Interrupting the Mother-Neonate Bond," *Science,* Vol. 145, Aug. 21, 1964.

enhance or detract from the initial suggestion, but rarely is the basic impression incorrect. Anatomically, the relationship between eye function and intelligence is clear, since the optic nerve is a prolongation of actual brain substance. It is more than coincidence that when we understand, we say, "I see."

Problems of concentration, dissociation, depersonalization, and consciousness are related to eye functions. Every patient with idiopathic epilepsy (epilepsy of unknown origin, which includes the larger number of epileptics) whom I have ever examined has had severe problems of eye armoring. If we are aware, we can notice that, as we drift toward sleep, there is a physical movement upward and inward of the eyes into the skull. Any individual with problems of concentration has difficulty with the therapeutic exercises of following a darting object quickly. A tennis partner with heavy eye armoring constantly makes last minute dashes at the ball because his eyes constantly go off until roused at the last moment by his brain.

A detailed investigation of the varieties of optical perception make semantic problems ("What did he mean by *that*?") seem simple in comparison. We never know what part of any situation others are "seeing." A schizophrenic patient reports that, when he looks at his mirror image, the picture of himself evaporates and he sees only the outline of his body against the reflected walls. Another patient comes to recognize, as we work persistently on her eyes, that in emotional situations, she picks out one detail in the scene and doggedly focuses on it to the exclusion of the gestalt. A third patient, when her eye functioning improves, recognizes that she had lived in a relatively monochromatic world until that time. A fourth patient always places his head askew when he looks at me. When I attempt to position my head parallel to his, he moves to maintain the skewed angle. From childhood, he has had difficulties with numbers in series. He often mismeasures, and because he works in carpentry, his labor is unnecessarily burdened. He lacks visual memory to the extent that, if he closes his eyes, he can barely remember what he has just seen.

None of these patients came to therapy because of visual problems. Each had symptoms which, so far as he/she knew, had no connection with armoring of the eye segment. Not invariably, but often, disorders of visual acuity, e.g., myopias, improve with work on this segment.

The eye is unique among the sensory organs in that it not only has receptive and coordinating functions, but it is also an organ of expression. A devastating look can sometimes be more punitive than a physical blow. Eyes warm with understanding can do more to quiet pain than a chapterful of uttered ratiocinations. The energy discharged by vital eyes is powerfully effective and communicative. Just as so many eyes are crippled in their sensory functions, they are impaired expressively.

All emotions should be able to be stated fully through the eyes. Withering rage, deep sadness, acute fear, lively joy, deep longing—the major emotions, and the corollary expressions of affect—excitement, disdain, suspicion, questioning, flirtation, disappointment, etc., have their distinctive ocular expressions. The degree to which the eyes are incapable of expressing these emotions is an index of the extent of eye armoring.

Some individuals are specialists in a particular expression, hauteur for example, behind which they hide all other emotions, which they fear to express. Others walk about with blank eyes that communicate their own message: "I do not wish to be

involved; please keep your distance." Social worker eyes (a generalization, to be sure) say, "I care, I care," to cover "Please, somebody love me," at a deeper level. Whenever a mask is worn as habitual demeanor, there is an accompanying set of eyes.

In the repression of some emotions, not only the visual expression but the physiological concomitants of those expressions are rendered nonfunctional. Thus, some patients begin to cry vocally and their eyes look sad, but there are no tears, or perhaps a slight moistening in the corners of their eyes. "I haven't cried since I was a child," they say. Not only has the desire to cry been banished, but the ability of the tear glands to produce the fluid of lachrymation has been destroyed. In the same way, along with the decreased capacity to express lively emotions, the power of the ocular muscles to move the eye with alacrity is often diminished.

The most common subjective symptom of armoring in the eye segment is headache. This may be due to muscular tension in the frontal or, less frequently, in the parietal or temporal areas, or to suboccipital tension that radiates forward. An occasional headache does not indicate that there is serious armoring in this segment, but recurrent headaches increase the possibility of the presence of chronic armoring. Various emotions may underlie the contraction in this area. The brows may be chronically knit in worry, or the forehead may be habitually raised as the eyes are widened in fear, or tensed as the brow is contracted in pain.

In some anxious individuals, the scalp is taut and tightly drawn; others, often with dead eyes, have a scalp that sits slack on their skull like loose skin.

Healthy eyes have a light that moves people and lifts spirits. Dull eyes have a draining quality.

The intimate relationship between the parts of an armored segment is illustrated by how the ears are sometimes deeply affected when the eyes go off. Several of the schizophrenic patients (whose eyes are badly armored) have recurrent complaints of ear disorder. One often pokes at an ear during the session, complaining that "something's wrong there." Another complained for weeks of severe ear pain. Examination by otoscope revealed no organic lesion. Auditory hallucinations are another indication of disordered ear function. They often occur concurrently with visual hallucinations. The clearest indicator of the eye-ear relationship occurs when the patient has been alert during the session, and suddenly the eyes go out of contact completely. The therapist addresses a remark to the patient at this time. When the eyes come back into contact, the therapist questions the patient on what he (the therapist) has just said. The patient looks surprised; he hasn't heard a thing. When the eyes went off, the ears did too.

The disordered function of the sense of smell is more difficult to evaluate. Whether, in the process of evolution, the sense of smell has been so devalued, or whether the sense has suffered because of acculturation ("dirty" anal smells and "evil" genital odors), alterations of this sense do not appear with any great frequency in the examination of patients. To be sure, one sees patients with olfactory hallucinations, but more discrete, subtler alterations of function are only rarely observed.

Finally, some general comments about this segment: Long ago the eyes were described as "mirrors of the soul." The language may be antiquated but the observation is true. There is no single segment of the body that reveals as much of character as the eyes. The sneaky, tricky, guilty, self-effacing, officious, mean, sad, bitter, cyni-

cal, scared, lively, ardent, hopeful, trusting, joyful qualities that combine to define the character structure can be read in the eyes. It is because eyes are so powerful that they are so widely avoided. To read eyes deeply is to be exposed to the pain, anger, and dismay of our fellows, which is a heavy burden. On the other hand, the deadened eyes can't look for long at bright eyes. They react as if the light were too bright. Sexuality is revealed in eyes as surely as in the pelvis; not merely flirtatiousness or the momentary bright that the phallic character (the womanizer) flashes, but the revelation of how much energy one permits to flow in one's body, how deeply one lets oneself feel.

Armoring in the eye segment is revealed first by simple inspection. The therapist, when he first greets the patient, when he elicits the complaint and the history, gets the feeling of the quality of the patient's eye contact, and he arrives at a general evaluation of the relative dullness or liveliness of the patient's eyes. When the patient is on the couch, the therapist tests the ability of the eyes to express anger, sadness, fear, joy, suspicion, tenderness, etc. The habitual over-employment of any of these uses of the eyes, e.g., the constant side-glancing of the eyes in a suspecting manner, will help the therapist to arrive at a diagnosis, or begin to unravel the character structure. There are various maneuvers to test the patient's coordinative abilities. He may be asked to open his eyes wide, then squeeze them shut, and to coordinate this with inspiration and expiration. Individuals who have difficulty with concentration are unable to do this consistently over a long period. In testing this faculty, it may be revealed that the patient has difficulty opening his eyes widely or shutting them tightly. He may be asked to revolve his eyes around the walls as quickly as possible (the patient is supine) while seeing. Careful observation reveals whether the patient is moving his eyes in a purely motoric exercise, not visually sensing, or whether his eyes stick in a particular position, revealing distraction by a thought or simply turning off. He may be asked to follow a finger darting within his visual field, or better, a flashlight. The inability of the eye muscles to perform reveals that the segment is armored.

The forehead and cheeks should be mobile. The patient should easily be able to make silly, frightened, angry, and sad faces, and to be serious in serious situations. Facial affect should be appropriate and proportioned.

The Oral Segment

The oral segment extends posteriorly from the chin to encompass the mouth, the jaw, the cheeks, and the occipital muscles. It includes the upper reaches of the throat interiorly. Functionally, these structures subserve all the uses of the vocal apparatus—talking, crying, screaming, laughing, etc. They include the functions of sucking, biting, and grimacing. The character attitudes of the chin, jutting in pugnacity or slack in renunciation, are part of this segment.

Emotionally, the deepest expression of the oral segment centers on the ability to suck and the manner of sucking. Many of the other oral functions evolved in response to how the sucking needs were met in infancy. Constant, babbling loquaciousness, tight grinding jaws, a sullen facial expression, thin, taut lips, and a tight voice might never exist if the infant's oral needs had been completely gratified.

Although there is an obvious functional unity to this segment, as illustrated by the fact that therapeutic work on the jaws often results in liberating energy in the mouth

and lips, the oral segment well exemplifies the principle of the interrelatedness of armor segments. For example, some throat functions are clearly within the anatomical limits of this segment, and others within the next lower, cervical segment. Though a forward-jutting chin is produced by the musculature of the oral segment, the retraction of the jaw is at least in part produced by the platysma of the cervical segment. Some facial expressions, for example, anger, cannot be completed without the full participation of the ocular segment. For this reason, it may be impossible to elicit the repressed emotion in the oral segment until the armoring in the ocular segment has been worked through.

Besides pugnacity and slackness, which have been mentioned, the jaw participates in more subtle expressions. The slight raising of chin and lower lips expresses either doubt or disdain, depending on the accent. When the chin is lowered and the lower lip drawn downward and laterally, the expression is one of irony—to say the facts or events that have been witnessed do not fit any better than these parted, skewed lips.

There is a way of holding the jaw in a kind of squared configuration (I cannot describe it more graphically) that is habitual among some male homosexuals and less pronounced in some "butch" lesbians. It is so pathognomic of the homosexual condition in some persons (though it is not a universal attribute of male homosexual facies) that one can diagnose homosexuality at a distance on the basis of this jaw configuration. For years, I have tried unsuccessfully to fathom the meaning of this jaw-set. There is anger and cynicism in it, but there is a particular meaning in it that escapes me, and which I am sure is a key to homosexual character. A perceptive reader of the manuscript suggested that it represents a fierce fixation on the mother's nipple. This seems a valuable start.

Lips tell a tale both in their form and in the way in which they are held. There are the thick-lipped, agape-mouthed types that bespeak low energy and mental defect. It is as if they lacked the will or energy to *form* their mouths; their mouths represent not much more than a hole in which to introduce food. There are thin, tight, bitter lips, salacious lips that look crawly, lips that sit tightly against the teeth in a sneer ("No thanks, I want no part of you or your food."), tense, beefy lips always waiting to be fed, and soft, rounded lips that can kiss sweetly and suck tenderly.

A frequent constellation in our society is the lips pursed in a vapid smile set against expressionless cheeks. The complete emptiness and utter lack of joy in this parody of a smile is obvious; yet it is prevalent. How can it be so transparent and, at the same time, so successful? For, whatever exists and persists must, at some level, work. The answer is that there is such plenitude of pain and sorrow, and such deep fear of feeling and expressing it that, by common consent, we say, "I will pretend that you are happy, if you pretend that I am happy." Smile, you're on Candid Camera.

The voice is an instrument for conveying messages. In ordinary conversation, the ratio of truth uttered to statements broadcast is a tiny, sad fraction. The truth of a statement does not lie in the verbalization alone, but in the voice quality. The mumble-voice says, "I am talking to you from a greater distance and through a thicker wall than you know." The wobbly, thin voice says, "I am frightened." The frail voice, two registers too high, says, "Though I look like a woman, I am a little girl." The voice that drones on in a monotone says, "Everything is dull; nothing excites me." The breathy voice says, "Do you remember the sounds of love-making?" The voice

resolutely projected in barrel tones says, "I want you to think of me as a big, strong man." Etc., etc.

One of the too commonly encountered voice tones is the whine. One hears traces of it almost everywhere—in patients, in social encounters, in actors. Whining could be the symbol of the voice of our time. It expresses dissatisfaction and frustration, but mostly it expresses veiled anger. Whining is a way of annoying your mother while you give the appearance of suffering. Whiners are incapable of expressing their deep rage overtly, so they resort to this noisome vexation.

Tension in the throat makes most people speak at a higher frequency and with less modulation than is normal.

A patient is requested to sigh as she breathes. Her first attempts emerge as high and wispy sounds. She is instructed to visualize her throat as a big, wide, soft tube which carries deep sounds, and to lower her voice accordingly. The voice gets lower and lower as she sighs more freely, and finally she hits a low, resonant note full of feeling. Her mouth shapes into a smile of pleasure and she says, "There it is."

There is a "right" tonal range for each person. The armored throats always vocalize outside that range. The unarmored voice varies constantly—in pitch, volume, and intensity—so it is a thing of interest and a pleasure to hear, even disregarding the words. Again, a note on the interdependence of armor segments: Although it is clear that the throat muscles and vocal cord tension are supremely important in the emotional expression of the voice, the breath power is supplied by the chest and diaphragm, several segments lower.

The unarmored throat is sensitive to slight tactile pressures, and the gag reflex is easily elicited. The infant is the model for the readiness to gag and vomit. When, after years of training, we learn to successfully swallow our crying and screaming with our tense throats, we no longer gag as easily. We thrust a fistful of fingers into our mouths and touch and probe the back of our throat, but all that happens is that we salivate copiously. In other cases, each time we begin to gag, we hold our breath, or cough. Armoring has blocked a simple, biological reflex.

Many years ago, a patient with the proselytizing fervor of many new patients reported in his psychology class on his discovery in the course of his psychotherapy that he was unable to gag. The instructor and his classmates laughed with such hilarity that the class could not continue.

The jaws are frequently the locus of contained anger. At the time in an individual's history when the arms and legs are still too feeble to administer punishing blows, the power of the jaw musculature is sufficient to injure an offender, and the threat of that power, as in a grimace which exposes the teeth, is effective in warning the antagonist of hostile intent. Repressed anger restrained in chronically taut jaw musculature is the agent of nighttime tooth-gnashing and some dental problems. When the tension is severe, the individual may walk about with a chronic low-grade pain in the jaws. In armoring of the jaws, deep palpation in the angle of the jaw will reveal the taut musculature and elicit the hypersensitive pain reaction. However, palpation is often not necessary to ascertain that the jaw is armored. Long practice makes the masseter muscles stand out in some individuals, so the diagnosis can be made on simple inspection.

The tension in the jaw may also be determined by attempting to move the chin freely (opening and shutting the mouth) while the patient rests at ease. In some patients, brute force is necessary to open,

then to shut the mouth, despite the patient's best attempts to cooperate. From long armoring, the jaw can only be mobilized voluntarily by the patient; it will no longer move easily, passively.

Mobility of lips and mouth is demonstrated by requesting the patient to move those parts voluntarily in face-making. Where the segment is armored, there may be difficulty in moving the mouth in all positions, or in moving the lips independently. In the armored patient, movement of the lips may be a sore embarrassment, and the request to suck his thumb may be shamefully declined. Often the armored mouth reveals itself in a gradually accentuated perioral pallor as the patient breathes easily.

The varieties of sucking patterns reveal character as they illustrate specific armoring. Some suck so greedily that they would swallow their thumb if it were detachable. Others suck with the merest fingertip in their mouth. Some suck without involving their tongue, making little suction cups of their lips. Healthy, unarmored mouths make sensuous contact with the included finger and suck with efficient vacuum force, but not avariciously.

There is a special final place for holding crying that has passed the throat. This is the region of the submental triangle, behind the point of the chin. The tension of the muscles in this area, together with the tension in the deep neck muscles, is experienced as a "lump" in the throat.

When the oral segment is free of armoring, it should move smoothly in making grimacing faces, silly faces, or angry faces, and be able to participate with the eye segment in expressing wide-eyed, open-mouthed fear. It should be capable of biting with force, but not be chronically contracted in a biting pattern. The voice should reflect a throat free of tension, be capable of expressing fearful screaming, thundering rage, sobbing that reaches to the belly and withal, be always full, serious, and modulated to express the nuances of all feelings. Sucking should be easy and should provide pleasure and peace. The skin should respond to emotional states with appropriate color. The face should be flushed in the expression of anger and love, pale when the body experiences fear. The purple coloration of the face in the expression of rage indicates strong armoring in the neck segment; it is unnatural. The chronic plethoric coloration of the hypertensive and the alcoholic is also a mark of armoring. There should be no sharp lines of color or temperature demarcation. The skin (as in every segment) should have a vibrant quality.

The Cervical Segment

This segment covers the area of the neck. The platysma, trapezius, and sternomastoid are the chief superficial muscles, but the important armoring often centers in the deep neck musculature. The tongue is included in this segment because of its attachment to the hyoid bone, a part of the cervical osseous structure. The throat, larynx, trachea, esophagus, and thyroid gland are incorporated within this area and thus subject to functional disorder.* The fact that the cervical and brachial plexi, the carotid arteries, jugular veins, and vagus nerve are in relatively exposed positions creates the potential for serious disturbance with acute armoring, and calls for therapeutic caution in approaching this segment. Armoring in the cervical segment functions to hold back screaming and crying, and to convert aggressive anger into stubborn resistance. The cervical segment is one of

*Dew, R. A.: "The Biopathic Diathesis (Part VI: Hyperthyroidism)," *Journal of Orgonomy,* Vol. 7, No. 1, May 1973.

the chief body areas where the history of physical beatings in childhood is engraved.

A young adult female patient lying on the couch is asked to scream. "I can't," she answers timidly and with a trace of cuteness. "Do the best you can," the therapist requests. She tries, and emits a faint squeak. "Try again, and do it louder," he says. She tries, with the same result. He grasps her tense cervical musculature, and pressing moderately, he urges her again. This time she utters a soft yell, followed immediately by a seizure of coughing and choking till the tears run from her eyes. She stretches her palms up as if to ward off a blow, and her neck becomes doubly stiff.

The act of swallowing back the scream or the cry can easily be observed as the larynx bobs up and down. If the swallowing is forbidden, the patient reacts in one of three ways. Either he will quiet his respiration to the point where the impulse disappears, or he will begin to cough or to gag, or, if he is sufficiently courageous, he will scream or cry.

An arthritic woman in her forties, who barely speaks above a whisper and hasn't raised her voice in anger or crying for decades, lies on the couch in apparent distress. She looks brittle, as if the world is gradually impinging on her body space, imperceptibly but slowly crushing her. Her appearance is so anguished that the young therapist (this transpired decades ago) is moved to do *something* to relieve the pressure. The holding in the throat is so strong and so obvious that he assumes that if he can free a little emotion from her throat, she will be more comfortable. He applies pressure to the pipe-rigid neck, which she suffers stoically. He increases the pressure and urges her to react vocally. Finally, a few discreet tears drop from the corners of her eyes and she utters a soft, mewing cry. After a moment of this, she takes a rough, very deep breath and fails to exhale. Her eyes are staring, and she is not breathing. Pressure on the chest and exhortations are to no avail. She continues to take these long, hoarse inspiratory breaths at what seems like minute intervals. She is beginning to become cyanotic. The therapist calls the police emergency squad to administer oxygen. The application of the mask and oxygen make no difference; she still is not breathing. We decide to transport her to the nearest hospital for emergency Ear, Nose and Throat consultation. Her color is still bluish, but not deepening. The consultant can find no organic etiology for this state of affairs, and comments that he never saw a patient with so little breathing, yet in no apparent danger. Her vital signs are within normal limits. We leave her in the care of a resident who reported that, over the span of a few hours, her chest began to move more regularly, her color improved, and completely matter-of-factly she asked if she could now go home.

Often, in eliciting a history, the patient is asked, "Do you ever cry?" The patient answers, "I cry all the time." When the patient is on the couch and the crying is evidenced, it is an exaggerated whine through an armored throat. It bears little resemblance to full, deep crying. It represents the spillover of the repressed grief that never gets released, just as constant irritability and bitchiness represent the overflow of unreleased rage.

Deep crying, though it is ultimately liberated through the throat, has its origin in the diaphragmatic region, and surfaces downward to the abdomen and upward through the wide-open throat and mouth. When one cries or screams fully, one is the vessel of the emotion. The crying comes in waves that may increase in intensity at the beginning, then gradually decrease with time. To the extent that one observes

oneself crying, or alters the sound or intensity, the crying is not free. Despite the intensity of the pain which is at the source of the crying, the full surrender to the impulse is satisfying. There is exhilaration in the freedom to give in to one's energetic flow.

Because of the habit of clamping the throat against emitting the sound of intense emotions, it is frequently physically painful for patients to attempt to scream. The throat automatically constricts against the emerging sound and, after a few attempts, the patient cannot go on because of the pain. This no longer happens when the throat is unarmored; then one may scream for long periods without discomfort. The only physical consequence may be a temporary slight deepening of the voice.

Chronic constriction in the neck is related to the tendency to faint (because of pressure on the carotids), to the fear of fainting, and of being throttled (the physical sensation of constriction is converted in suitable subjects to the fantasied choking). The fear of choking, in turn, is related to some fears of being crowded ("I will not be able to catch my breath."). The hypertensive with the reddish face is holding in his neck so that the circulation from his head is blocked off. The terrible-tempered, purple-faced despot has attained his purple coloration by virtue of acute cervical armoring which tightens to contain his deepest rage. Because of this armoring he often "chokes with rage." The cervical armoring, together with oral blocking, has been implicated by Dew* in the etiology of hyperthyroidism. The reader is referred to the original article for amplification.

The compulsive individual may manifest cervical armoring which is centered not so much in the deep throat muscles as in the muscles which control turning or tilting the head. He holds his head rigidly straight, and when you attempt to turn his head to right or left, there is great resistance. This armoring has evolved in part from his need to travel the straight and narrow path. He cannot permit himself the dangerous possibility of straying, and his neck-set performs the same function as blinders on a horse.

The same armoring is present in those who are hypersensitive to sudden turns and twists, reacting with dizziness and nausea (assuming, of course, that there is no disorder of the cerebellum or inner ear).

The rigid compulsive patient sitting on the edge of the couch is asked to move his neck, shoulders, and arms as freely as he can. With his best efforts, he can only move his head to a position about 30^0 from forward, and he moves as if his head were mounted on a ratchet. The therapist works on the posterior cervical musculature, then moves the patient's head side-to-side at a larger angle. The patient is then requested to try again. Now his head revolves farther and more easily, but he soon stops. He says, "I can't do that; it makes me sick to my stomach."

The largest cause of armoring of the posterior cervical musculature, however, is stubbornness. The armoring conveys two messages. On the deepest level, it represents the inability to give in to the rage that is present, and on the more superficial level, it says, "You cannot hurt me or push me further; I will not yield." It is the only available means of opposition in some persons who are unable to actively oppose. If the reader will play at being stubborn, he will note how these neck muscles automatically stiffen. Cervical armoring is the signature of stubbornness.

*Dew, R. A.: "The Biopathic Diathesis (Part VI: Hyperthyroidism)," *Journal of Orgonomy,* Vol. 7, No. 1, May 1973.

There is another possible meaning in this armoring. Individuals who have been physically beaten in their childhood, or those to whom the environment administered a symbolic beating, learned to harden themselves against the blow and against their reactive rage by tightening their necks and attempting to reduce its surface area. In some, this became a chronic attitude of withdrawal, and their necks grew that way permanently.

And finally, there is the cervical armoring of the haughty—those who attempt to make themselves high. Here the neck musculature appears as if stretched, the superficial muscles, especially in older persons, standing out beneath the skin as taut strings of ropes. The attempt here is to create as much distance as possible between the spiritual head and the benighted body, especially its naughty nether parts. Such necks must never surrender softly, lest the body sensations pervert the lofty brain.

The unarmored cervical segment is capable of crying, screaming, and raging freely; vocal sounds are resonant and emotionally responsive. The esophagus is free to participate in the gag reflex. The neck is capable of free, coordinated, and graceful movement, and participates with shoulder movements in a harmonious manner. Palpation reveals no inordinate muscular tension.

The Thoracic Segment

The thoracic segment extends from below the neck to the diaphragm. The musculature involved includes the pectoralis major and minor, the deltoids, the serratus, the intercostals, the trapezius, the latissimus dorsi, the rhomboids, the infra-spinatus and other smaller muscles, and the deep fascia. If any segment were to be considered more important than another (though if we are examining complete emotional and physical functioning, such a consideration is merely an intellectual exercise), it would be the thoracic segment, for two reasons. First, because it contains organs absolutely vital to the life process, the heart and lungs. Second, because it is the chief motor source of the body's energy level. Thus, armoring in this segment affects the function of every other segment. In addition to the heart and lungs, the only other organ of importance in this segment is the esophagus which, in the context of therapy, is significant because it is apparently the locus (possibly with the lower end of the trachea) of the complaint of a "knot" in the chest, and also because it participates in the gag reflex.

There is no patient who comes to therapy who does not exhibit some degree of armoring of the chest segment. In some, the chest may be granitic from years of constraint; in others, the only difficulty may be in the amplitude or completeness of the respiratory excursions. The fact that every patient has an armored chest does not imply, however, that an unarmored chest is tantamount to health. Theoretically, it is possible for the chest to be unarmored and for armoring to be present in other segments, particularly lower ones; this is often the case in the process of therapy. But in the course of everyday life, it would be unlikely because of the dynamics of chest armoring, i.e., if there is armoring in another segment, it is unlikely that the chest, too, would not be armored to decrease the energetic push against the armored segment.

To live one's life with a totally free chest implies the ability to feel fully, to immerse oneself in the currents of existence with daring and energy, and generally, to be free of armoring. For, wherever there is armoring elsewhere in the body, the chest segment comes to the aid of that armoring by reducing the intensity of the energetic input, thus ameliorating the perceived pain.

If one represses a scream in the throat, the armored chest assists in that process by braking the general energy level, making it less likely that one would feel like screaming. If the healthy newborn is subjected to the insult of long separations from its mother, as in a typical American hospital, there is "increasing and persistent muscular tension, and this increasing tension is accompanied by inadequate breathing," as Margaret Ribble* noted in her study of 600 newborns. If the vicissitudes of life induce some to turn away by not seeing, chest armoring comes to the aid of the eye armoring by dampening the life fires, making their lives a walk-through part.

By reducing the energy level, chest armoring makes all pain less acute, all conflicts less tense. Unbearable situations tend to become more tolerable. Chest armoring begins in early infancy when the neonate discovers the tension-alleviating properties of the deep inspiration, followed by incomplete expiration. Later, at the age at which objects of fear can be recognized, the child reacts with the deep drawn intake of breath, which becomes part of the pathognomonic reaction to fear. In a society in which the needs of infants and children are so poorly met, in which conformity is valued, the prevalence of chest armoring is no surprise.

One of the more acute manifestations of chest armoring occurs in the anxiety syndrome. Here one not only sees the chest held in fear of exposure of the repressed emotion, but the patient perceives the armoring acutely and lists it prominently among his symptoms. "I can't catch my breath." "I get this knot in my chest." "My chest feels as if there's a weight on it."

The hypertensive patient always has an armored chest. Whether the chest held in chronic expansion is etiologic in the hypertensive disorder, or whether the same pathology constricts the blood vessels as it constricts the chest, is difficult to say. The relationship of chest armoring to organic heart disease is highly suggestive but, at this point, incompletely elucidated. Dew** has made valuable contributions to the consideration of chest armoring and its relationship to arteriosclerosis and coronary artery disease.

Disorders of the respiratory apparatus, e.g., emphysema, bronchial asthma, chronic bronchitis, chronic obstructive pulmonary disease, bronchogenic carcinoma, etc., are associated with specific configurations of chest armoring. Dew*** has described these connections, and once again the interested reader is referred to the original articles for detailed articulation of these processes.

The armoring of the chest, aside from its function as energy inhibitor, serves specifically to clamp down on the strongest expressions of love, rage, sadness, and longing, as well as fear. It is not by chance that the popular imagination has linked the heart and emotions of love. The lover in the throes of his passion recognizes that unique sensation in his chest which we name love. In fact, his ignorance of anatomy and perhaps his preoccupation with his love object have betrayed him. What he perceives as the pleasant affection of his "heart-shaped" heart is actually the suffusion of pleasurable sensation from the coeliac plexus (solar plexus), which lies beneath his diaphragm. In the experience of pleasure, the sensation spreads upwards

*Ribble, M.: *Infantile Experience in Relation to Personality Development in Personality and Behavior Disorders*, J. McV. Hunt, Rd. R. Hunt Co., New York, 1944.

**Dew, R. A.: "The Biopathic Diathesis (Part IV)," *Journal of Orgonomy, Vol.* 4, No. 2, Nov. 1970.

***Dew, R. A.: "The Biopathic Diathesis (Part V)," *Journal of Orgonomy,* Vol. 6, Nos. 1 and 2, May and Nov. 1972.

from the plexus through the chest and downward through the abdomen toward the genitals. And, in the course of experiencing these delicious sensations, the lover's chest heaves with rapture, as the old writers used to say.

The complete expression of any deep emotion is accompanied by the same wide excursions of the chest. The chest surges with deep longing. It pants with rage, and it convulses in billows with sobbing. Conversely, it is held as rigidly as possible when these emotions must be repressed. As hot rage is characterized by the heaving chest, cold rage is described by the held chest, the taut, tense exterior with the fire burning deep within.

The central role of chest armoring, both as energy inhibitor and as a clamp on deep emotions, is the reason that breathing figures so predominantly in psychiatric orgone therapy. Free and open breathing energizes the body and accentuates the areas of armoring, calling them into play by increasing the energetic pressure. New patients are often amazed at the inner turmoil a few full breaths can create.

The patient, on the couch for the first time, is asked to breathe according to the therapist's instructions. She is a shy, severely inhibited young lady, with pronounced symptomatology, seeking relief from her pain; so she follows the instructions diligently. After a dozen breaths, tremors appear, first in her jaw, then her shoulders, and soon she is all atremble. She feels strong currents going through her torso and extremities. "What are you doing to me?" she asks. "Is this bed hooked up to anything?" and she curiously looks around for wires. "No wires, no connections," the therapist answers, "that's all from your breathing." "You mean just taking those few breaths did this; would the same thing happen if I did it at home?" "It would if you did it the same way, but you had better not try it yet without supervision," he advises.

There is often interest in the relationship between unarmored breathing and the breathing prescribed in yoga exercises. They are quite different, both in the mechanics and in effect. Yoga breathing entails inspiring deeply and exhaling a long, conrolled breath, and its object is control. The breathing in therapy entails moderately deep inspiration with uncontrolled expiration; the emphasis is on the complete and uninhibited release of the inspired air. Its object is the exposure to freedom and the abandonment of control mechanisms—the opposite of the yogic object.

The breathing mechanism may be disturbed in either its inspiratory or expiratory phases. In individuals who breathe very shallowly, the inhibition to expiration may not be apparent until the inspiratory phase is increased. The reason is that with minimal breathing there is no cause for inhibition. There is so little oxygen intake, the fires burn so low, that nothing is stirred up; there is just enough energy to work to maintain existence. When the patient is asked to breathe more deeply, a marked distortion appears in the expiratory phase.

A new patient breathing superficially, his chest barely moving, is requested to breathe more deeply. After a few breaths he proceeds to clear his throat on almost every expiration. He is admonished to stop this, and he does. He proceeds then to push each breath out, as if exhaling operated on the piston principle. He is instructed to fill his chest, and merely to let it collapse, without any impetus. He proceeds to inspire deeply, raising and tightening his shoulders and constricting his neck at the top of each inspiration. The therapist proceeds to work on the exposed cervical armoring, digging his fingers into the tight musculature.

Another barely-breather is requested to breathe more deeply, and he increases his breathing in scarcely perceptible increments. The therapist encourages wider breathing by applying pressure to the sternum with each expiration, and supplementing this with work on the intercostals in the region of the axilla. Now the patient is breathing more deeply and, for a few moments, his breathing is less inhibited. "This feels good, doc," he says. He looks more alive and is clearly enjoying this new status, but he cannot maintain it for long, for now his diaphragmatic armoring comes into play and he proceeds to balloon his belly with each expiration.

From a therapeutic point of view, uninhibited breathing may be examined in two ways. The narrower aspect concerns its energizing function. The broader view incorporates the awareness that with totally free expiration, there is an energetic impulse that, if unimpeded, proceeds through the abdomen and is perceived in the genitals. This aspect of respiration has no direct connection to the air-breathing function of respiration. It is the reason that individuals armor against free breathing in segments below the chest. As the chest armoring decreases in therapy, the armoring in the lower segments increases to ward off the sensations of the anxiety-provoking energy as it courses to the genitals.

A quotation from a patient who was beginning to learn to breathe fully on expiration is indirectly pertinent to this phenomenon. She said, "Breathing all the way down makes you feel as if you have legs. When I was a child I never felt my legs; they weren't as if they were anesthetized, but as if they were just hanging there."

Another patient said, "When I breathe all the way down, and it's soft down there, I get the feeling that I'll be swept away, and I have to hold on."

Others are not able to define the difficulty so exactly. One patient working on breathing down freely says, "I don't want to do this. I don't want to feel this," and she proceeds to cry.

The inhibition of respiration to diminish discomfort is a process that starts in early infancy. The child holding its breath is attempting to establish a *modus vivendi;* some body sense is aware that, in the face of unbearable pain, inspiration, held as long as possible, will block the pain. For lesser pain, the prescription is not as dramatic; one need merely impede the completion of expiration.

In patients, one observes many varieties of the inhibition to complete expiration. There is the expiration in two parts, in jerks, the half or three-quarter expiration, the propulsive expiration, the expiration with sudden brakes, etc.

We have been speaking of the relationship of respiration to the regulation of one's own emotions. Respiration also relates the individual to his world. In deep inspiration, we take in the world, in an almost literal sense. And in full expiration, we abandon ourselves to a cosmic stream. Insofar as we are afraid of life or fearful of other people, we cannot risk free breathing.

In addition to the respiratory function, the thoracic segment includes the muscular activity of the shoulder girdle and upper extremities. The chief armoring function of the shoulder girdle is to activate the defensive armor plate of the scapula, clavicle, and shoulder musculature. With fear or anxiety, there is compression of the dorsal musculature and a tendency to raise the shoulders, as if to ward off blows from behind and protect the neck.

A patient who has problems expressing aggression is instructed to yell at me offensively, making an angry face. At first, her attempts are totally ineffectual, but

with encouragement and direction, the emotion of anger begins to come through. Simultaneous with the open expression of hostility, her shoulders proceed to rise until her skull is turtled into the shell of her shoulders.

The armoring of the musculature of the upper extremities involves either the inhibition of aggression or of reaching out with tenderness and longing.

A well-built, muscular man in his forties is directed to hit the couch angrily, with all his might. Each time he punches, the therapist observes, there is a sudden inhibition of velocity in his swing just before the point of contact, so that the resulting blow is merely a soft tap. The patient recognizes the validity of this observation and determines to try harder. The second attempt results in the same soft taps. Try as he may, he cannot punch hard.

A young man is directed to reach out with his arms, breathe fully and easily, and call "Mama" as he reaches. "Christ, doc, that's silly," he says, "Let's do something else." I insist, and he makes an embarrassed attempt, breaking into smiles, then laughter. His hands turn in on themselves, and I direct him to stretch the fingers out and reach as he continues. The voice becomes more convincing, but the hands keep turning inward, or the arms bend at the elbows. I persist in the complete expression of the reaching out and when, after a while, it is effected, the expression on the young man's face becomes serious and intense. He starts to cry, then sob.

One is reminded of group sensitivity sessions in which participants are encouraged to punch pillows, mats, etc., in an attempt to release repressed hostility. They punch and punch, and except for the value of the activity as exercise, they have achieved nothing, because each of them punches in his usual inhibited manner. The key to the therapeutic uses of aggressive activities does not lie merely in their indulgence or frequent repetition, but in discovering the emotional roots in the inhibition of their complete expression. How do they not punch with power, pinch, scratch, bite with venomous force?

The therapist engages in playful boxing with a young adult female patient. Despite his assurance that he will not hurt her, she cannot bring herself to move her arms from their protective position in front of her face. In spite of his verbal prodding, she cannot make the slightest aggressive movement. He continues to poke at her defensive position, and helpless, she begins to cry. This activity is a symbolic recreation of her lifelong reaction to others' aggression.

The inhibited aggression in the armored upper extremities is not only revealed in the larger shoulder and arm movements, but in tense finger movements, constantly drumming and twittering fingers, restless hands, etc.

I walk to the waiting room to call in the next patient. She is an early middle-aged woman with severe arthritis of the shoulders and neck. Superficially, she is always pleasant and passively cooperative. She is knitting, and so absorbed in the process that she is unaware of my presence. I watch her fingers as they work, and I gain a new appreciation of Madame Defarge knitting by the guillotine.

Just as the expression of hate and rage is inhibited in the hands and fingers, so is the manifestation of tenderness. There are persons whose touch is as gross as rough bark; their ability to perceive tenderly through their finger tips is as inept as their competence to transmit tenderness. This is also armoring.

With pronounced blocking of energy in the extremities, as in the thoracic armoring that accompanies anxiety, the hands are

cold and moist with cold sweat. This effect is so pronounced that it has become a sign for detecting the presence of anxiety.

Armoring of the paraspinal musculature (muscles along the spine) in the thoracic as well as in lower segments has the specific function of converting rage into spite. If the reader will pretend to feel spiteful, he will notice how these muscles along the spine tighten automatically. In a less intense mode, armoring of these same muscles accompanies interpersonal withdrawal.

The examination of armoring of the thoracic segment is conducted by observation of the skin tone, color changes, temperature changes, skin sensitivity, and tissue sensitivity within this area. The sensitivity of female breasts is, of course, of more far-reaching significance than the sensitivity of the male pectoral area. Armoring of respiration is recognized by visual inspection. Abnormal tension in the paraspinal and shoulder area is established by palpation and observation of abnormal carriage. Armoring affecting the aggressive uses of the upper extremities is elicited when the patient attempts to punch, pinch, throttle, scratch, etc. Ticklishness to any marked degree and an irritability to touch in the thoracic region are indices of armoring in this area.

The free chest looks soft and alive. It is free of any tension at the bottom of expiration, and the shoulders move forward gently in an expression of yielding as the neck and head flex backward softly and subtly.

The Diaphragmatic Segment

The diaphragmatic segment occupies the body region between the thoracic cavity superiorly and the abdominal cavity inferiorly. The diaphragm arises from the xiphoid process of the sternum anteriorly, the lower six ribs on either side, and the first (possibly the second) lumbar vertebrae posteriorly. It lies in close association to the pericardium, esophagus, stomach, duodenum, liver, gall bladder, kidneys, pancreas, and spleen. From the point of view of the therapy, probably its most significant anatomic relationship is that to the coeliac plexus (solar plexus).

On a purely physiological-anatomic level, the diaphragm is used in all expulsive efforts, whether sneezing, crying, coughing, laughing, vomiting, excreting feces or urine, or expelling the fetus from the uterus. The fact that so many of these acts are experienced as pleasurable (or unpleasurable) relates to the function of the diaphragmatic segment as it appears in the process of the therapy. From the naming of these expulsive acts, it is apparent that the energies of the diaphragm may be expended either upward to the cephalic end, or downward to the caudal end. In infants, one can sometimes observe the simultaneous discharges of the diaphragm in either direction as the infant vomits and defecates in one swoop. In therapy, one occasionally observes the same free play of the diaphragm when the patient vomits propulsively and passes flatus.

The close relationship of the diaphragm to the heart and to a host of abdominal viscera would indicate that armoring in this segment may be accompanied by a number of organic disorders. Clinical practice confirms this. *

We have indicated that the diaphragm pointed, as it were, toward the head is

*Nelson, Arthur: "The Diaphragmatic Block," *Journal of Orgonomy*, Vol. 6, Nov. 1972.

*Dew, R. A.: "The Biopathic Diathesis (Part VIII: Gastrointestinal Peptic Ulcer)," *Journal of Orgonomy*, Vol. 7, No. 2, Nov. 1973.

*Levy, N.: "Hepatitis as a Complication of Therapy," *Journal of Orgonomy*, Vol. 4, May 1970.

associated with vomiting; and vomiting is a physiological expression of disgust. ("I cannot stomach this.") The diaphragm poised for discharge at the caudal end, as in diarrhea, is obviously related to rage at an anal level. It is therefore not surprising that armoring of the diaphragm may contain explosive rage going back to infantile levels.

However, the chief significance of the diaphragmatic segment in therapy (and here is its uniqueness) is not what emotions are contained when the segment armors, but what eventuates when it (and the segments above it) is free of armoring. At this point, we leave the realm of words that we use to describe emotions and enter the province of biological functioning. Just as we have no word to describe the feeling of tropism or imprinting, unless we choose to be fatuous, there is no word that conveys the meaning of the phenomenon that occurs when the patient, unarmored from head through diaphragm, breathes through freely. What happens is a series of waves of pleasurable sensation that move toward the pelvis, accompanied by a folding of the upper abdomen, so that the upper torso and pelvis approximate one another, while the head and neck fall back in a yielding posture. The closest word that describes this occurrence is "surrender." But we must remember that the word is several dimensions removed from the phenomenon per se.

Armoring in the diaphragmatic segment is revealed in its respiratory aspect in catching at the bottom of the expiratory breath, and in ballooning of the abdomen with expiration. There is frequently a spinal lordosis (arching) present; the space between the patient's back and the surface of the couch easily contains the breadth and width of the therapist's hand. The muscular tension responsible for the lordosis is revealed in the patient's hypersensitivity to deep palpation, and in the ropiness of the muscles of the back.

In therapeutic usage, the maneuver most closely associated with diaphragmatic armoring is gagging. The sensitivity of the receptors in the throat form the afferent end of the reflex, and the diaphragmatic impulse the efferent end. Whereas at the oral end, the gagging may be distorted by variable play of the throat muscles or conversion of gagging to coughing, at the diaphragmatic level, the only variability is in the intensity of the diaphragmatic contraction. The late Dr. Theodore Wolfe thought that vomiting accompanied by flatus was the ultimate expression of the free diaphragm. In eliciting the gag reflex, the most important provision is that the patient breathe freely and continuously while gagging.

It is quite reasonable to assume that for such a basic reflex as the gag reflex to be lost, there must be a significant cause. The fact that the reflex is impaired in so many individuals makes the case even more intriguing. In what cause have we sacrificed a biological reflex?

The clue was provided to Reich* in the course of treating a patient. He observed that, with repeated deep expirations, the patient developed such hypersensitivity of the lower abdomen and pelvic region that he reacted by holding his breath. Each time Reich touched the sensitive area, the patient reacted with a start. But when he had the patient continue to breathe down, the sensitivity to touch disappeared; and when the breath was held again, the sensitivity returned. This phenomenon could be repeated at will.

The hypersensitivity in the abdominal

*Reich, W.: *The Function of the Orgasm*, The Noonday Press, N.Y. 1961, pg. 3.

and pelvic segments clearly related to an inability to tolerate sexual sensation; this obtained only when the breath was held and the diaphragm tense. When the diaphragm was coaxed to the unarmored condition and the breath was let down, the sexual sensations could be tolerated. Conversely, with the diaphragm armored, the sexual flow was successfully stopped, but tension and reflex irritability occurred in the patient (an analogue of anxiety). In the act of balancing between anxiety and sexuality, the diaphragm played a critical role.

A question poses itself at this point. How does the diaphragm serve this crucial function? An examination of the functional anatomy of the area provides us with a plausible answer. First, the diaphragm is a powerful muscle. We have already seen how, when the diaphragm functions without tension, it is characterized by propulsive responses (sneezing, vomiting, diarrhea, etc.). On the other hand, when it is tense, it constitutes a pretty powerful bundle of tension. The second fact is the presence of the solar plexus, the largest of the sympathetic plexi, in this immediate area. The leafy proliferation of organs beneath the diaphragm speaks of the energy that flows in this area. Given, then, a system that discharges a large quantum of energy (the solar plexus), and a system capable of blocking off a great deal of energy (the diaphragm), the situation of the diaphragmatic segment as the releaser or inhibitor of energy flowing to lower segments is comprehensible.

To reiterate: The armored diaphragm may serve to bind deep rage; it may also limit crying to a tolerable level; when it functions in this manner, the crying is characterized by repeated short jerks within one expiration, rather than the inspiratory-expiratory heaving of the full cry. But its largest function in armoring is to bind energy that would be intolerable to the subject if perceived and experienced. The fact that people spontaneously point to this area when speaking of overwhelming emotions confirms this use of the armored diaphragm.

Armoring in the diaphragmatic segment is revealed by an inability to breathe to the full completion of expiration, by ballooning of the abdomen with expiration, by the inability to vomit with gagging, by lordosis of the spine, excessive ticklishness of the diaphragmatic region, spasmodic crying, holding in this region when expressing anger, and by the inability to perceive pleasurable sensation in the subdiaphragmatic areas of the body with full, free breathing.

The Abdominal Segment

The abdominal segment extends from below the diaphragm to the brim of the pelvis. The musculature includes the external oblique muscles and their aponeurosis, the internal oblique muscles, and the transversus abdominis and rectus abdominis, all of these located anteriorly and laterally; the latissimus dorsi, sacrospinalis, quadratus lumborum, and psoas major and minor muscles, located posteriorly. The abdominal segment contains the larger portion of the intestines, the lower edges of the kidneys, the ureters, and the upper portions of the uterus and urinary bladder.

The abdomen is held tight mostly from fear. When the abdominal armoring is attacked, fear is the first emotion observed, and then the rage that is always covered by fear. The two areas where fear of physical assault resides are the back of the neck (from apprehension of a possible blow to the head) and the abdomen (from terror of a blow to the belly). A. S. Neill,* the

*Neill, A. S.: *The Free Child,* Herbert Jenkins, LTD, London, S.W., 1953.

founder of the Summerhill School, was fond of classifying his charges into the stiff bellies and the soft bellies, roughly the fearful and the self-assured.

To a lesser extent, the fear of physical attack resides posteriorly in the lumbar musculature, also. The common expression of armored loin muscles is the tension of spite. However, in my experience, the spite contained in the shoulder and neck armoring exceeds that of the abdominal segment. There is often tension in the flank region in those who are relatively unarmored, but who have not had the opportunity for genital discharge over a long time. This tension usually disappears when the sexual needs are gratified.

The presence of abdominal armoring is recognized when there are temperature or color demarcations over the surface of the area; when there is superficial or deep muscular tension in the area; when the wave of excitation that originates in the diaphragmatic segment when the patient breathes down is blocked in the abdomen; when there is excessive ticklishness of the flank musculature; or when somatic* illness in the segment reflects the armoring.

We had been working on breathing-through without resistance, and the patient was beginning to get the knack. As she proceeded, she felt first generally pleasurable sensations flowing in her abdomen, then more specifically genital sensations, which she enjoyed at first but soon terminated by holding her chest. She reported that she couldn't go on because the picture of her father suddenly appeared in her head, and thereafter the sensations became scary.

When she arrived for her next visit, she looked as if she were privy to some great secret. "Boy, do I have something to show you," she said, as she passed me at my desk and moved into the treatment room.

As I observed her on the treatment couch, there was a diffuse rosy rash starting in a discreet line across the middle of her abdomen. "See that," she said, "it's a red light; it says, 'Stop!'."

The Pelvic Segment

The pelvic segment consists of all the structures below the pelvic brim, including the lower extremities. Most of the pelvic musculature is involved in the armoring of this segment, but among the most frequently involved muscles are the levator ani, the anal sphincters, the bulbocavernosus, the ischiocavernosus (which regulate erection of the penis and clitoris), the gluteal muscles, and the thigh adductors.

The pelvic segment contains the uterus and ovaries, the male reproductive apparatus, the external genitalia, the urinary bladder, the urethra, and the distal portion of the intestinal tract with the rectum and anus.

In this culture, armoring of the pelvic segment is practically universal. If the pelvis was not armored with the prohibitions of toilet training in the anal stage, it could hardly escape the pleasure dampening effect of a love-negative culture several years later. In this context, it is appropriate to mention that the apparent relative sexual freedom of contemporary adolescents must not be confused with sexual health. While it is obvious that there is more sexual activity in adolescence than heretofore, and while this is generally to be preferred over abstinence, the greater part of adolescent sex is of the "balling" and "screwing" variety, a long distance from healthy loving. So we do not anticipate that the generation of the children of our children will be free of pelvic armoring.

*Dew, R. A.: "The Biopathic Diathesis (Part VII: Gastrointestinal Peptic Ulcer)," *Journal of Orgonomy*, Vol. 7, No. 2, Nov. 1973.

The armored pelvis lacks life. When it essays to engage in the genital embrace, it does so in a business-like, or perfunctory, or athletic, or pretending-to-feel-what-it-doesn't, or hateful, or pornographic, or little scratch-an-itch, or I-expect-this-to-be-a-soul-searing, earthshaking experience fashion. The sex-researchers and the sex professors, (and I am not demeaning the value of much of their research, but describing the point from which they start) like most of the rest of us, have armored pelves.

The main function of the armored pelvis is to avoid the full sensation of the flow of energy into the genitals. In attaining this end, the anus is chronically constricted, or if the tension is not chronic, it constricts acutely and is pulled back by the levator muscles as sexual excitement increases. The pelvis tends to be held in a retracted position. The buttocks are tensed and often cold. The thigh adductors are tense, tending to hold the legs together. The pelvic floor is drawn up. The penis inclines to a cyanotic bluish coloration in some cases, and though one does not have the opportunity to inspect the vaginal mucosa in therapy, the probability that there is a similar tendency in some females is high.

One occasionally sees another kind of dead pelvis characterized, at least superficially, by an appearance of utter flaccidity and flabbiness.

When the individual with an armored pelvis is requested to move his pelvis, he tends to move legs, pelvis, and abdomen in one piece, as if they were plastered together. The side-to-side pelvic movement (the pelvic "no") is much easier for him to achieve than the independent back and forth pelvic tilt (the pelvic "yes").

The downward, wave-like sensations achieved by freeing the upper segments of armoring are stopped as by a wall at the pelvis. There is either total anesthesia for the pleasurable sensations, or they are perceived minimally, and as their intensity increases, so does anxiety.

A patient who has endured pelvic anxiety for months in therapy, but who has been free of her acute anxiety attacks for more than a month, reports that the degree of sexual pleasure with her husband has exceeded anything she had known. In the midst of this halcyon period, she calls from work for an emergency appointment. When she arrives, she is pale, but not as badly shaken as in the past. "It happened again," she says, "and I thought that maybe I was through for good. It started down here (pointing to pelvis), and it gradually rose to my head, and I started to get nutty; and then it started to go downward, and when it got to there (pelvis), I got so scared I thought I would faint, so I sat down on a step and called my assistant."

Another young lady working through pelvic armoring says, "I was having sex and it was better than it's ever been, and suddenly something happened that I think felt good, but I got so scared that I opened my mouth to scream, and I was so damned scared that nothing came out."

Anxiety is the hallmark of pelvic armoring. The anxiety in this case is the result of the acute fear of the sensation of strong pleasure. There is a rage behind this anxiety that describes the bitter anger of being denied what felt so good. Rage and contempt sometimes speak directly in the hardness with which some people "make love," but the general, unconscious, cultural awareness of this fact is revealed in the epithet of epithets, "Fuck you."

To be continued.

The Biopathic Diathesis in the Treatment of the Ocular Segment

BYRON S. BRAID, M.D.

The circumstances in which biopathic illnesses appear have always struck me. During internship, I was assigned the case of an elderly woman with severe congestive heart failure. She and her husband had been together for over fifty years and loved each other dearly. He stayed with her as much as possible during her hospitalization. She did not do well, suffered a cardiac collapse, and despite all attempts at resuscitation, passed away. The husband was told, and within 20 minutes, he was admitted to the hospital with congestive heart failure and pulmonary edema. I could not help but believe that what had happened to him was simply acute heartbreak over losing his wife.

Later, in my first year of residency, I discovered quite serendipitously how even a character-analytic interpretation could elicit a profound biological response with biopathic expression. The patient, a 40-year-old single woman with a history of rheumatoid arthritis, was referred to treatment because she felt depressed and unfulfilled. She lived a very dependent life with her widowed mother and rarely dated. She tended to place herself in the role of a martyr, especially with respect to her mother, toward whom she bore considerable, though repressed, resentment. Sessions with her were painfully slow, with her continual whining and complaining. All my attempts to elicit anger were deflected by her martyred, saintly facade. One day I said to her, "You don't have a nasty bone in your body," an allusion to her rheumatoid arthritis and its relationship to her inability to express rage or aggression. Initially, she took the interpretation with her customary apathy, that is, no response. The next day, however, was quite a different matter. She telephoned to tell me she was having the worst attack of rheumatoid arthritis she had ever had in her life, and asked what I was going to do about it. I sent her to the rheumatologist and asked her to come in earlier than the next scheduled session. She refused. The next day, she called to say that she felt depressed and suicidal and never wanted to see me again. I tried unsuccessfully to convince her to come in that very day, if not to see me then one of the other residents. The following day, I received another call; this time she was furious. She ranted and raved at me for over an hour, calling me names, cursing me. When she finished, she agreed to an appointment the following day. She arrived looking more alive than I'd ever seen her before. She said that her rheumatoid attack had stopped within an hour after she finished the phone tirade with me. Despite the overall good result, I was nevertheless more cautious about my interpretations with her over the next several months.

There has been a growing interest in providing orgonomic training for inexperienced individuals without thorough medical training. I was recently approached by a nurse of brief acquaintance who asked me if there was training for other than physicians. When I replied in the negative, she gleefully told me that two of her friend were going to get training by "Reichians," obviously trying to bait me for a response. This brief encounter was the stimulus for the present paper, which shows dramatically what can happen as a consequence of exciting a patient and disturbing the armor.

Case History

The patient, a 23-year-old, single female nurse, presented with an acute suicidal crisis. She had been hospitalized following an episode in which she could not stop banging her head against a wall. When I first saw her she was huddled in a ball totally covered as if for protection. She looked paralyzed with fear, and all attempts at verbal communication were futile. She was too frightened to speak. I sat next to her, held her hand, and encouraged her to look at me, which she was able to do after a lengthy period of time. In an attempt to draw energy from the head segment, I asked her to kick on the bed, which was successful in alleviating a significant amount of panic. An attempt at history-taking was unsuccessful due to her fear and confusion, but as time passed, her sensorium became more clear and a most gruesome history emerged.

The patient was one of three children; her mother had died from leukemia when she was five years old. Her father, outwardly a "pillar of the community," was a successful businessman. He was also an alcoholic, who began physically and sexually abusing the patient when she was two years old. The abuse increased around the time of her mother's death, and escalated well into adolescence. Father threatened her repeatedly with outrageous and mortal threats. For example, he would tell her that if she moved at all, or made a sound, he would kill her. He would choke her around her throat and push on her chest until she could barely breathe. As therapy progressed, more of these memories came out with considerable dramatic affect; the maliciousness of her father seems to have known no bounds. He continually derided her; she felt she could do no right. In fact, when she expressed the feeling that she had been the cause of her mother's death, her father made no attempt to talk her out of it. She felt very close to the mother, who fell ill with the leukemia around the same time that she became aware of her husband's behavior. The illness prevented her from leaving him, and it is clear that, even in the terminal phases of her life, she was quite devoted to the patient, who would risk beatings and abuse to be with her. She was persistently accused of hurting mother, and so devised a way of getting into bed with mother taking extreme care not to touch her in a way that would hurt. Even then, when discovered by father, she would be accused of causing mother's pain.

One year after mother's death, father remarried. The patient did not like her stepmother. She was afraid to tell her about father's behavior; she had been threatened with death if she revealed the truth. When she dropped hints, stepmother would fail to understand them, and to this day does not acknowledge father's responsibility for the behavior, instead blaming the patient. As an adolescent she discussed the sexually and physically abusive behavior with her minister and family doctors, none of whom believed her. Apparently, her parents had approached these various people in advance and warned them that the patient might be telling outrageous stories about them, and since they were pillars of the community, who would believe a young adolescent trouble-maker, the role in which she was cast. This role, incidentally, is exactly the opposite of the way she presents herself, which is as being the "best girl" possible, to avoid any possibility of criticism or dissatisfaction.

At her best, she demonstrated considerable talents. In addition to being an accomplished musician and athlete, she quickly achieved a position of considerable responsibility as a nurse and had a reputation for being a quick study. For even the

most complicated procedure, she needed to be shown only once and then could teach it to the next student. She has never been content with the more mundane aspects of nursing and is continually involved with technical innovations.

Biophysical Examination

On initial examination she looked terrified and severely contracted, with practically ashen skin. Armoring was heavy in every segment and especially prominent in the eyes, jaw, and neck. It was difficult to discriminate among the major muscle groups in the neck, and initial attempts to loosen tension in the trapezii and sternomastoids produced no effect regardless of the effort applied. Examination of the eyes revealed persistently dilated pupils, a profound look of terror; eye contact for more than a few seconds produced flinching. Breathing was shallow; and the chest was initially tough and resistant. With manual pressure, however, it softened up dramatically, as if to collapse. The abdomen was board-like, and the lower extremities were, in addition to the excellent athletic development, extremely tight. It was in fact difficult for her to move her legs for quite some time after the beginning stages of therapy. From the standpoint of physical appearance, the bulk of her body development was from the waist down.

Significant medical problems included endometriosis and amenorrhea. Also of interest is that in the initial phases of treatment she never perspired, a fact she remarked upon once perspiration began.

Course of Treatment

The patient has been seen twice weekly, with more frequent sessions when necessary, since 1980. Therapy has focused on the ocular segment, with incursions into the oral and cervical segments when the eyes have cleared, and very occasionally there has been prodding at the diaphragmatic and abdominal segments in an attempt to stimulate breathing. The major emphasis has been on the eye segment.

Terror was readily elicited; in the initial phase of treatment the simple act of opening the eyes would be enough to make her shrink to a corner of the couch. I attempted to elicit screaming with wide-open eyes in order to discharge this emotion from the eye segment. In the sixth month of treatment, attempts to scream were accompanied by an acute reaction of panic, hyperventilation, and fear of suffocation. Her skin would change color, initially bright red and then cyanotic, and she increasingly had difficulty in making any sound. The patient appeared to be suffering from acute laryngospasm. Genuinely worried about her suffocating, I discontinued her efforts to scream, held her, encouraged her to relax, and told her that despite the way she felt she was indeed in a safe place. She calmed down over a period of several minutes, and for the remainder of the session, I stayed away from the biophysical work. Similar episodes occurred several times, and the two of us became much more alert to the warning signs, so that we were able eventually to produce an increase in excitement without going too far. As time progressed, she was able to tolerate more feeling in the throat without closing down; but, as will be seen, this was replaced with other symptoms. Initially, the patient had no associations to the laryngospasm, but as she was able to tolerate more feeling, she became aware of childhood memories of her father grabbing her around the neck and threatening her with suffocation. Previously, her memory of this behavior was indistinct.

Approximately 18 months into treatment, a new set of symptoms arose during

work on the eye segment. Following an especially productive session, the patient stated that she felt different than she had remembered, relaxed, peaceful, and even a bit contented. Her musculature at the end of the session had none of the characteristic tightness, her eyes were clear, the chest moved smoothly, and her legs were soft. By the time she got home, she felt "funny," but made nothing of it. The next morning, however, she noticed that when she went to punch in the time card, she missed the machine. Then she noticed a blind spot in her field of vision. Physical examination by a neurologist revealed a right-sided hemianopsia, and the neurologist suggested an immediate arteriogram. The patient declined, suspecting that it was related to her armoring, and immediately called for an appointment. By the time I saw her that afternoon, she reported a piercing left-sided headache, with the sensation of a knot at the base of her left occiput. I focused my attention on the base of the skull bilaterally. After two sessions, the visual field cut normalized. A similar sequence of events occurred several times over the next year. The therapy remained directed at getting the patient to tolerate more fear, this time with increasing eye contact, and gradually the frequency and duration of headaches diminished; at this point they rarely occur. The abnormalities in vision are no longer present.

Therapy continued on the eye segment with no further somatic biopathic outbreaks until mid-1985, when she began to develop some abdominal cramping. This was soon followed by the appearance of dark, tarry stools, lassitude, and an episode of fainting. She went to her family doctor, the same one who discounted her stories about father, who sloughed off her complaints as viral, and who made no attempt to work her up diagnostically. She felt hurt, depressed and full of despair. She expressed doubts about herself, wondering whether her perception of the physical sensations and symptoms was accurate. Concerned about a supervening medical problem, I referred her to another physician for an unbiased opinion. Endoscopy was performed and revealed many small peptic ulcers which, by that time, appeared to be healing. In addition, she was found to be severely anemic, unable to absorb iron, and suffering from Heinz body anemia and Von Willebrand's Disease, the latter two of which are congenital and were thought to have been aggravated by her exercise program. Hospitalization was recommended, transfusion accomplished, with improvement of the anemia and a return of strength, whereupon therapy was resumed on the eye segment. Childhood memories were coming back on a daily basis, producing a deep sense of terror, which was discharged by yelling, opening the eyes with a terrified look, and kicking. This time there were neither headaches nor laryngospasm; and the patient has been able to tolerate much more movement. Stark terror has been increasingly expressed, so far without the outbreak of biopathic illness. Memories of the past have caused her to react as though she were in her father's presence and that the threat of death is imminent. She is "returned to the present" with gentle touch, holding her, getting her to look at me, establishing my identity.

Socially, life is considerably different at this point. Early in therapy, she had a relationship with a man whom I had the opportunity to meet. He impressed me as arrogant, angry, and contemptuous. She asked what I thought, and I told her without mincing words. She protested. Later, it emerged that he began to physically and verbally abuse her. She initially withheld this from me, but at the same

time, there was an enormous increase in the amount of terror and immobilization coming out in the sessions. Finally, she was able to break off the relationship. Most recently, she has begun a new relationship with a more sympathetic man. He has his own problems, and he's not able to handle much of the patient's anxiety, especially where it concerns issues around emotional intimacy. Despite her insecurity and the rocky start in their relationship, she has been able to confront him on her needs; he has been able to make a mature effort to respond appropriately, rather than to run away, as he had earlier. They have recently begun to explore the possibility of marriage.

Discussion

As this case has progressed, I have become more cautious with this patient; this has been rewarded with progress. However, even with the substantial gains she has made, we cannot consider her to be as yet "out of the woods." Biopathic breakdown could occur at any point along the way. It is clear that medical as well as psychiatric diagnostic acumen are indispensable in cases such as these. Of the greatest import is that these situations are not rare, and in some degree complicate the treatment of many of our patients. It is not difficult to imagine the damage possible in the treatment of patients with this potential by undertrained, unqualified, and unskilled "Reichians," whose major incentive is a narcissistic need to produce dramatic results.

Clinical Symposia

The Clinical Symposia will appear as a regular feature of the *Annals of the Institute for Orgonomic Science.* The edited material from the training seminars of the Institute presented in the Clinical Symposia is intended to provide the readership with information regarding the theory and practice of orgone therapy.

HYSTERIA

The following seminar took place on February 8, 1987.

Courtney F. Baker, M.D.: This seminar is really a continuation of our last seminar on hysteria. Some of the members of the group were not present, and unfortunately it was not taped, so we will try to review a little of it for you as some very good points were made.

We began with a brief review of hysteria as it is presented in the orgonomic literature. We think of hysteria as a character type with easily recognizable subtypes, fixated at the genital level of development but with anxiety. One of the things that emerged from the discussion was the tremendous role of the pregenital blocks in hysteria, in particular, the oral block. Classical psychoanalytic literature recognizes that hysterics have an oral fixation, and I have found that, with great regularity, patients who are diagnosed as hysterics have tight jaws and throats. So the question arose as to whether there is such a thing as a pure hysteric, or whether the pregenital blocks are absolutely necessary in order for there to be a powerful oedipal fixation. We also discussed the classical description of hysteria, which recognizes a cold, rejecting, or otherwise emotionally unavailable mother, which causes the little girl to turn to the father for warmth and comfort. The important factor is not just that there is an overemphasized relationship with the father, which becomes sexualized, but that there was a problem with the mother to begin with which facilitated it. In other words, it appears that the earlier, and therefore deeper, pregenital problem lays the groundwork for, and may be a necessary substrate for, the subsequent oedipal problem.

Questions were also raised about the basic energetic differences between males and females and the qualitative differences that have sometimes been ascribed to culture.

Arthur Nelson, M.D.: I think what we were talking about was really the question of what is pathology. Reich believed that pathology was whatever stopped the energy from flowing to the genitals, or prevented the discharge of energy through the genitals, because of the earlier blocking, which binds the energy in the upper segments and therefore makes it unavailable for genital discharge. If the energy can be discharged fully through the genitals, without anxiety, then there can be no substrate for pathology.

Louisa Lance, M.D.: In our last seminar, we also talked about the innate differences between males and females with reference to behavior and attitudes that are considered to be feminine in our culture. It is also noteworthy to keep in mind that infants are born with individual energetic makeups, which may then be encouraged and amplified or discouraged and repressed by the parents.

Dr. Baker: There was a study done in which pre-adolescent boys and girls were given blocks to play with. The boys built castles and turrets and structures which

went upwards, and the girls built rooms that were enclosed. They seemed to have two basic world views, either that of penetration or enclosure. If there seems to be such a difference in the way that these two groups go about things, then how much of that behavior can be attributed to basic biologic and energetic differences, and how much can be attributed to learned and cultural differences?

Morton Herskowitz, D.O.: It was also mentioned that, until recently, female sexuality was defined by male psychiatrists and therefore what has been termed pathologic may in some cases simply be normal feminine behavior. For example, women seem to think more intuitively than men, who incline towards more formal, logical thinking.

Dr. Lance: We also talked about how the traditional roles have changed somewhat in families who are raising children and what influence this might have on future families. Traditionally, the female was the primary nurturer and this was considered to be an innate, normal trait in women. With two working parents, it has been necessary to modify and sometimes even reverse these traditional roles. There is much more consideration given to the effects of "parenting" on the child, more interaction of fathers with the children, and often much more responsibility for child-rearing given to men than in previous generations. In the past, the woman was the primary caretaker, and therefore had most of the input into the development of the child. With males sharing or having a greater role in raising the child, will this influence and/or change our ideas on what is learned versus what is innate?

Dr. Herskowitz: I remember that I cautioned last time that we must always remember that whatever is happening in our culture, we should always keep in mind that it is just a tiny fragment of the human population and be careful not to generalize too widely. We are just a tiny, tiny bit of it.

Douglas Levinson, M.D.: There was a study done at UCLA of alternative child-rearing arrangements in which couples who were hell-bent on changing things showed that no matter what the couples involved said about their plans or views before the fact, after having children, not one case was found where it did not end up that the mother had the role of primary caretaker. The father might spend more time than average doing caretaking tasks, but it was never primary or even equal.

Dr. Lance: Another interesting study showed that in couples who attempted to bring up their children without any sexual gender bias, it didn't work. Even if the children had never been exposed to guns or dolls, male children gravitated to guns when they were presented, and the little girls were drawn to dolls.

Dr. Baker: Has anyone read any studies about what goes on in the more primitive societies?

Byron Braid, M.D.: Some African tribes who are geographically separated by as few as three miles have totally different cultural attitudes which seem to depend on things having to do with the survival of the group as a whole. For example, if there is famine in one area, the cultural group may be more concerned with the survival of the adults, and children as young as sixteen months may be left to fend for themselves. In other groups, the children may be everything.

Dr. Herskowitz: I think that in the vast majority of cultures the mother is the primary caretaker. There are a very few exceptions, but in the vast majority, it is the mother.

Karl Fossum, M.D.: It's a fascinating idea that there may be biologic, innate patterns

that exist in children despite cultural differences. Have there been studies done as to the kinds of play male and female children select on their own in these other cultures?

Dr. Braid: I remember reading that, in reviewing Malinowski's observations of Trobriand children, Reich found that the kind of games they played were identical in many ways to those he had played as a child in Central Europe, but with an important difference. In the Trobriand children, games like hide-and-seek had the aim of an age-appropriate sexual behavior; whereas in Central Europe, the aim of that game was to make someone else "IT." The structure of the game was similar, but the purpose of the game was quite different in the two groups.

Dr. Herskowitz: I think it is generally true that boys play aggressive games like king-of-the-mountain and girls play quieter games like dolls and house.

Dr. Levinson: Going back to the practical level, there is a tremendous difference within the sexes in our own culture. How much of these are innate, temperamental differences and how much are due to differences in child-rearing is hard to say.

Robert A. Dew, M.D.: Reich stated that he thought latency was an artifact of our culture. Does anyone remember the basis for this statement?

Dr. Braid: Yes. His study of the Trobrianders showed that most of the children had become sexually experienced at around eight or nine years of age and that there was no point in their childhood where their heterosexual interest did not continue or progress.

Dr. Dew: So Reich's conclusion was that the so-called latency period occurred because of the unavailability, for one reason or another, of an age-appropriate sexual partner.

Dr. Lance: In our culture, the latency period was thought to be not only an absence of heterosexual interest, but an absence of autoerotic interest as well. Yet I have found that, if I question patients very carefully, they never stopped masturbating during this period. They may have gone "underground" with it because of the sexual taboos in this society, but they didn't give up the autoerotic pleasure. I think it is true that a person can sort of "forget," because during that period more of their interests become very outward directed. It is the age when children become more interested in academics, sports, and other social pursuits, so that it is possible that masturbation assumed a different relative position. Now it is also possible that the same "forgetfullness" occurs about their heterosexual activity during that period, which may be partially due to the upsurge of other interests combined with the existing societal taboos.

Dr. Baker: Now what does all this have to do with hysteria?

Dr. Lance: Well, we were talking about the entire problem of what are normal differences between little girls and boys and what is pathologic. We've also said that the formulations of this have been largely determined by men in the past and more recently by women who have obvious biases of their own. It is a fact that, in this culture, dependency is encouraged in girls and girls grow up wanting a lot of oral satisfaction. It is not encouraged in boys.

Dr. Baker: I still say that in a large majority of hysterics there is a great deal of oral blocking and a tremendous problem with the mother which revolves around feeling unaccepted and having a poor self-esteem. So I think it's more than just that the dependency or orality was encouraged or discouraged. I have hysterics at forty years of age who are still working things

out with their mothers. We have always thought of the hysteric as having a problem with competition with the mother; but often the patient comes to realize that the mother was actually very competitive with them. If the mother views the little girl as the feminine person that she herself was not, and therefore resents her and puts her down, the girl receives little or no validation for herself as a feminine person. It is this early problem with orality, and therefore the mother, that has to do with the child's concept of self-esteem. In treating patients, I have found that after spending a lot of time dealing with problems with relationships, the bottom line becomes the problem with the mother and the oral stage of development. This is just to reiterate that, if the focus in the treatment of hysterics is on the oedipal period, it may be a red herring and may miss the deeper and more important developmental problem.

Dr. Braid: One of my current patients illustrates those points rather well. I'm treating a fifteen-year-old girl who is a budding hysteric with bulemic symptoms. She is an attractive young girl who, on the surface, seemed to have major conflicts with her father. It took a long time for her father to be able to admit to his own difficulty in being demonstrative with his daughter after the onset of her puberty. He stated that he had been so influenced by the reportage of sexual abuse that he feared that if he was openly affectionate with his daughter it might be misconstrued, so he pulled back from showing her much attention or affection. In a way, I suppose I got caught up in this theme because it seemed to have such prominence in terms of their relationship and it wasn't for some time that the deeper picture emerged. In discussing her bulemia and her preoccupation with being too fat, it dawned on me. The patient herself is very thin but her mother is built like a Sherman tank. Suddenly it became clear to me that the person who is too fat is her mother. The conflict with her mother was being acted out with her bulemic symptoms. The focus of her treatment then shifted from her problems with her father to those concerning her mother. So here the oedipal problems were indeed preceded by the deeper conflict with a mother who was cold and rejecting. In fact, the mother also always acted helpless but secretly was the boss of the family.

Dr. Herskowitz: We have to remember that, in general, girls have more trouble with their mothers than their fathers. Has anyone ever seen a bona fide hysteric who has had a good relationship with her mother?

Dr. Dew: I think this came up during the last seminar and we came to the same conclusion. The basic problem may be with the mother, but certainly the father does play a role in the genesis of hysteria.

Dr. Lance: It is certainly very common for fathers to withdraw from their female children at puberty because of their own problems with sexuality. This withdrawal would no doubt reactivate conflicts from the first oedipal period and intensify the deeper problems with the mother.

Dr. Levinson: In general, do women patients have poor relationships with their mothers?

Dr. Baker: I have some patients with good relationships with their mothers. They are women, but they are not hysterics.

Dr. Lance: Frankly, I think mothers get a lot of undeserved bad press. Mothers have had so much input into raising the child, boy or girl, that it is likely that most of the child's frustrations and conflicts are ascribed to her "because she was there."

Dr. Dew: As a matter of fact, in all the pregenital characters, the major identification is with the mother regardless of the

sex of the child. I suppose there are some instances where the father contributes significantly to the formation of a pregenital block, but primarily it is the mother. This might have something to do with the fact that people in general don't have good relationships with their mothers. But, all this still doesn't explain just what makes an hysteric an hysteric. Is it something that specifically happens during the pregenital phases, or is there something peculiar to the genital phase? During our training, we were taught that the hysteric reaches the genital stage of development with most of the energy available to excite the genitals and that it is in this phase that she encounters the biggest disappointment, and that it is this period that casts the specific stamp on the character structure. Do we know anything that should change that formulation of the genesis of hysteria?

Dr. Baker: I think we touched on that last time. One thing that has to be considered is what the child evokes in the parent. A little girl who is a tomboy from the start will evoke something different from her father than the one who is feminine from the beginning. It may be that in our culture the girls who are intrinsically more feminine will become hysterics because they have some quality from the very beginning that lends itself to the development of that character.

I have a patient, the younger of two girls, who is a textbook hysteric. The girl has always been at odds with her mother and is much closer to her father. The older sister, probably a phallic with an ocular block, has always gotten along well with her mother. It was this way with the two girls for as long as anyone can remember. The older sister was more intellectual and oriented towards accomplishments; whereas the younger girl was always more emotional and interested in relationships, and the mother had a problem with that. I think that each child enters the world with "something" that greatly influences the character structure development because of the responses that these innate traits evoke in others.

Dr. Levinson: What would those qualities be that would favor the development of the hysterical character? All of these patients have a self-centered quality which is both self-centeredness in the sense of wanting and drawing attention to themselves, and self-centered in the sense of being extremely sensitive. I have always been struck by Reich's bioelectric experiments where he measured the bioelectric potentials of hysterics' mouths and tongues, and the clinical correlation of the intensity of their disappointment reaction. These patients seem to have an enormous capacity for disappointment. Everyone lets them down, and they feel it more acutely than other character types. I would think that that quality would be very difficult to deal with in a child. So, it would seem that some of the traits that could be seen early on would be the characteristic changeableness, the intense capacity for disappointment, the narcissism with the sensitivity, as well as the self-aggrandizing qualities and the particular kind of manipulativeness.

Dr. Lance: There is also quite a difference in the quality of the excitement and the disappointment that you see in an hysteric as compared to a phallic. This is probably due to the fact that hysterics are generally more lightly armored so the intensity of both reactions is greater.

Dr. Levinson: Competitiveness is also a basic trait of hysterics. They are always competing for attention; they manipulate for attention, and they are enormously disappointed when they don't get it.

Dr. Baker: That's a good point. The hysteric competitiveness is for attention

and to bolster the hysteric's self-esteem. In the phallic, the competitiveness is towards achievement, which is a very different thing.

Dr. Lance: I think that the phallic is looking for the same thing but goes about it differently. The competitiveness for achievement is really a way to get attention. In the hysteric, it is a more personalized, "Look at me," whereas in the phallic, it is, "Look at what I've done"; but it is indirectly saying, "Look at me. I did that." I don't agree that the basic aim of the competitiveness is so different, just the method of gaining the attention.

Dr. Levinson: Hysterics seem to be living out some fantasy script which is usually oedipal, in which they are compelled to relive, and thus set everyone else up to relive, their personal scenario in an attempt to get it to come out the way they want it to. Whether it's the kind of attention they want, or the victory over other women, or the attention from the father, it is the winning that they are after. It is hard to explain hysteria just on the basis of what the father did or didn't do. Hysteria is a way of living, and everything in their lives becomes sexualized. It isn't like the phallic where just the phallus is sexualized and used as a weapon, as a defense against regression back to anal passivity.

Dr. Baker: Yes, and what you just said points out something else. This personal script that sets everyone up is really an important part of the dynamics of hysteria. The hysteric can not be direct, so she has to manipulate. Because she can't "own" her own impulses, she has to shift the responsibility to the other person. In this way, she is absolved of the responsibility for those impulses and becomes a passive recipient.

Dr. Lance: It would also seem that the little girl who has had to cope with a competitive and/or rejecting mother would learn to be manipulative in order to try to get some of her needs met.

Dr. Dew: Right. If she can't follow her instincts openly because of her concern of being rejected by her mother, she would have to manipulate in order to get what she wanted without incurring the wrath of the mother.

Dr. Braid: A practical extension of this may be the study of father-daughter incest where the situation is characterized by a cold and rejecting mother who consciously or unconsciously throws the two of them together in order to avoid her own negative sexuality.

Dr. Herskowitz: A thought just occurred to me. I once treated an hysteric who plainly said that there was not a moment when she was unaware of her vagina. Perhaps the hysteric is always trying to plug up that vagina and obviously since she can not do it overtly, she does it symbolically by constantly calling attention to herself and making herself the object of other people's attention. Maybe that's the source of the energy, to fill the vagina.

Dr. Braid: Reich said that the hysteric is flooded with sexual energy.

David Schwendeman, M.D.: I suspect that the little girl develops the capacity for manipulativeness long before the oedipal period. That particular way of behaving and handling life's situations is already there and is simply called into use when the oedipal crisis occurs. And I think that given these inborn qualities of temperament and tendencies to behave in certain ways, a lot is required of the parents not to fall into the trap of letting the little girl rely too heavily on any one of these particular ways of handling situations. If certain behaviors aren't reinforced, then the child has to learn other, healthier, more adaptive ways of handling things.

Dr. Lance: Even if the parents are very

good at recognizing certain stereotyped behavior, others may not see it and inadvertently reinforce it. I think it's fairly certain that a male family friend will respond one way to a girl who is acting "cutesy" and another way to a boy of the same age who is acting that way.

Dr. Baker: That's a good point. How many women respond to little boys who are cutesy or seductive?

Dr. Lance: Which brings up the question again as to whether there are innate differences in the energy systems of males and females.

Dr. Schwendeman: I think that there are "average differences," but there are certainly individual cases where a boy is far more "feminine" than his counterparts, and girls who are more "masculine" than their cohorts.

Dr. Dew: I think it is clear about the role of the mother in the genesis of an hysteric. It seems that this particular style is developed, perhaps because of an inborn incliation towards it, but also that the manipulativeness comes about because of the possibility of incurring the mother's wrath or withdrawal of affection, which makes it too risky to express any impulses directly. But, it is still somewhat unclear about the role of the father in creating the hysteric. It's possible that much of the approaching and running that is so typical of the hysteric has to do with how the father interacted with her.

Dr. Baker: I can think of one case that illustrates the father's role very clearly. One patient developed a close relationship with her father in her early years primarily because her mother was chronically depressed. The father was a professor of the classics and often would take the girl into his study and teach her Greek literature. He related to her in a very intellectual way, and the girl turned out to be an hysteric with an ocular block. At first, I considered her possibly a paranoid schizophrenic; that's how pulled up into her head she was. This was one of the clearest cases where the father's role was so definite in coloring the primary character type.

Dr. Dew: What made it clear to you that she was an hysteric?

Dr. Baker: At first it wasn't clear, but since she had such a pronounced ocular block, I worked on her eyes, and after a couple of months, it became apparent how labile, narcissistic, and sexually preoccupied she was. There was a decided sexual flavor about her and none of the cold distant feeling you see with most paranoid schizophrenics. She is a textbook hysteric. The father is certainly not irrelevant; he makes a big difference.

Dr. Lance: When the father becomes emotionally unavailable also colors the picture. And the mother's attitude towards him also influences how the daughter will see him. Very often, as hysterics get better, they realize that much of what they have been saying and even feeling about their fathers is but a carbon copy of their mother's views. It is true that many fathers will have problems with their daughter's emerging sexuality, but if there is also a sex-negative mother around, she will make sure that he has trouble with it.

Dr. Baker: I have three hysterics whose fathers died when they were children. Not only was it a tremendous disappointment, it was also seen as a desertion. In these cases, the mother had a total monopoly on shaping the girls' impressions of their dads, since they were no longer around to verify or negate those impressions.

Dr. Lance: In two of my cases, the mother has gone on to remarry after dating several men, and the daughters felt abandoned by their mothers, too.

Dr. Dew: It seems that if there are any

frightening aspects about the father, or if he is really struggling with his own sexual feelings when the girl reaches the oedipal stage, this would intensify the approach and avoidance quality of the hysteric. Come to think of it, the mother probably plays a parallel role in the genesis of the female phallic, even though the major identification has been with the father.

Dr. Baker: A patient of mine illustrates that quite well. Before the age of five, she was extremely feminine. In her history, the mother, who was a vicious hysteric, poisoned her against her father, who became a nonentity in the household. The father withdrew from his daughter when she was around age five, and the mother became even nastier. The girl began to identify with the father and started doing "masculine" things, like becoming interested in mechanics and cars. She developed a tough kind of facade and, even though she did not become homosexual, she had a strong interest in lesbian life.

Dr. Dew: She's a phallic woman?

Dr. Baker: Yes.

Dr. Braid: I know a ten-year-old girl whose mother died suddenly from pericarditis when the girl was five and a half. From that day on, she refused to wear a dress and became very aggressive. Her hair is cut like a boy's, she dislikes playing with the girls in her class, and out of her entire class, she has made herself the second best athlete. She is in a tough spot because the girls don't really like her because she hangs around the boys, and the latency-age boys don't really like her because she is too much like them.

Her father describes this as a real and distinct change that dates back to the death of her mother. It seems her entire identification is male, and I think it is her attempt to avoid any feelings of grief over the loss of her mother. Her father also told me that after the mother's death, the little girl adopted a pseudo-mature posture and tried to calm and nurture her younger brother and to some extent, even him. I have my own concerns about her homosexual potential because of her fear of dealing with anything feminine.

Dr. Lance: Yet, she seems to have retained a feminine role in the family.

Dr. Herskowitz: That's interesting in light of the oedipal legend, because you would think that with mother out of the picture the little girl would love to move into her place and really become the female.

Dr. Braid: Sure, I would have thought that too. One thing that's interesting is that if you go into their house, there is a huge wall just filled with photographs and right at the very top hangs a picture of the dead wife. So, in a way she is still top of the heap.

Dr. Dew: That may well be the reason the girl abandoned femininity so abruptly. Perhaps there was such a sharp competition with and resentment towards the mother that when she died it was too threatening for the little girl to dive into her slot and become more feminine. It would be like saying, "I won."

Dr. Lance: You mean that there may have been tremendous guilt because on some level the girl wished her dead. It certainly occurred at the right age for such a scenario.

Dr. Levinson: I'd like to comment on that. We're describing things that usually come up in the histories of hysterics and the behaviors we're describing are not those that we see in other kinds of cases. I always conclude that the true hysteric is such an incredible, complete type, that it is hard for me to believe that the basic predisposition isn't innate. I personally have trouble believing that if you consider the whole type, the facial appearance, the mouth, the entire energetic style, that all

this could be created by the parents de novo. How good or bad the relationship with the mother is, how much the father seduces, represses, or withdraws, could certainly channel the behavior and affect the outcome, but I believe that the makings are there from the beginning.

Dr. Herskowitz: What about the fact that no one here can think of an hysteric who had a good relationship with her mother?

Dr. Lance: Is it all that black or white? You could say that no one had a "good" relationship with their mother and that would be inaccurate too. People do have good relationships with their mothers, or at least good part-relationships. There could be a good relationship for part of the patient's life, or in particular areas or segments of their life. I think we have to be careful not to define good as conflict-free.

Dr. Fossum: If we were to accept the idea that these features of the hysteric are primarily innate, what consequences does that have for therapy?

Dr. Levinson: One of the most classic hysterical patients I ever treated had all of the features we've mentioned, including a poor relationship with her mother, and additionally was the victim of paternal incest. When I first met her, she even had that hysterical type of thought disorder in which, when they are upset, they can barely string two sentences together to make a point. It's virtually impossible to have a conversation with someone like this, and at one point, I began outlining certain aspects of the hysterical character for her in an attempt to explain to her why she always had so much difficulty communicating. In order to help her understand her behavior better, I also gave her a book to read on neurotic styles that gives one of the best descriptions of hysteria I have ever seen. This kind of understanding and awareness of her style of relating was extremely helpful to her; it allowed her to own up to what she was like and to deal with it.

Dr. Dew: In the last seminar, it was clearly brought out that whether the characteristics are innate or not, the most improvement occurs by working on the pregenital blocks and not getting sidetracked by the more obvious events of the genital period. One of the questions posed was what we as therapists can really help with, and I think we agreed that the most impressive changes occur as a result of consistently working on the pregenital conflicts. In fact, just working on the first three segments produces great improvement in the patient's functioning. So it would seem to follow that, if working on the pregenital blocks can improve them so much, then much of what goes on in the making of an hysteric does indeed happen in the pregenital phases. The notion that hysterics are relatively unhampered by pregenital blocks may be quite inaccurate.

Dr. Lance: Then you are also stating the aim of therapy in general is to clear up the pregenital blocks in order to allow the energy to flow freely into the genitals, without anxiety.

Carol Stoll, M.D.: There was an interesting program on television recently. I think it was taken from a graduate seminar presentation. The topic was that babies do have unique personalities. They showed three little girls, two- and three-year-olds, in a nursery situation. One girl entered the room and, right from the beginning, would investigate everything and talk to the parents that were there. The second girl would enter the room more cautiously, get the lay of the land, and then play with the first child. The third girl entered with her mother, clung to her, and sucked her thumb. On a few rare occasions, this third child would venture out, but the minute anything happened, she would run back to her mother

and stay there her sucking her thumb. This particular child's mother looked schizophrenic.

Dr. Lance: One wonders if that child would have turned out different with a different mother. Disparate energy levels or otherwise "bad fits" between parents and child must have an influence on shaping what is innate in the child.

Dr. Schwendeman: Going back to what Doug said earlier about understanding one's own style reminds me how important that understanding can be in seeing how it relates to and affects what went on with the parents. A man came to see me with the complaint that he just wasn't functioning very well in his life. During the course of his treatment, he saw that he wasn't functioning well because he had a tremendous amount of rage, which consumed much of his energy by his attempts to contain it. It came out that he was angry with two people. One was his father, who was pretty much a garden variety bastard, and the other was himself for having been so weak as to have been affected by him. This was in contrast to his two brothers who were raised in the same way but simply wrote the father off as a bastard and went on with their lives. Little by little, it became clear to me that one of this man's cardinal traits was loyalty, and it dawned on me that because of this loyalty he was in much greater conflict with his father since it is difficult to reconcile being loyal to someone who constantly treats you badly. As he began to understand that, he stopped seeing himself as so weak and began to see it as just something that happened between himself and his father because of this trait of loyalty.

Dr. Fossum: Here the cognitive approach affected a change rather than an expressive method.

Dr. Levinson: I've never been clear about the best admixture of those two, but it is clear that they go hand in hand.

Dr. Dew: Actually, Dave achieved two things. One, the man was helped, and second, it exposed another aspect of his character which could then be examined. Actually, it doesn't matter if you call that cognitive work or not, what it really is is good character-analytic work which transcends all the sub-disciplines. It's a good example of unravelling the layers of the character defenses.

Dr. Levinson: Just to bring up another point. Some of the patients I have the most trouble with are the hysterics who, no matter what you do, keep acting out the same scenario. It is just the way they see everything.

Dr. Dew: It can be infuriating. I have one who seems to see just how she is behaving and then, next session, she's acted out the same thing.

Dr. Braid: I have one that does that within the same session.

Dr. Lance: They literally don't see it, and that is a function of the eye block. Even if the eyes don't look so terrible, that sort of thing means that an eye block is present.

Dr. Baker: I'd expand on that a bit. They all keep doing the same thing. One of the reasons I brought up this whole business of the pregenital blocks is because it is one of the places where you can affect the behavior and stop it. The reason we don't have an impact on them, in many cases, is really because we're treating the wrong thing. If we recognize that their real problem is poor self-esteem and work on that in terms of the pregenital blocks, then a change can occur. Otherwise, some of them have these "breakthroughs" week after week, which are meaningless. It is absolutely essential to go after the more primitive blocks, and issues of self-esteem and dependency, in these patients.

Notes from Afield

Notes from Afield is intended as a forum for the presentation—in brief synoptic form—of findings from other sciences that bear more or less directly on any aspect of orgonomy. Readers are invited to contribute such material, citing the author, title, source, and date of publication. In the case of books or excerpts from books, the name of the publisher should be included. Contributors may also, if they wish, provide a commentary indicating the relevance of the information to orgonomy. The editors reserve the right to alter, revise, or add to such contributions as they deem necessary.

ANATOMIC AND BIOCHEMICAL CHANGES IN ANXIETY

"From Metapsychology to Molecular Biology: Explorations Into the Nature of Anxiety," by Eric R. Kandel, M.D. *Am. J. Psych.*, 140:10, October 1983.

In recent years, extensive data have been presented pertaining to the interface between neurosciences and behavioral sciences. Evidence has accumulated indicating that environmental events alter brain structure and function. Kandel has demonstrated that permanent learning (memory) is associated with structural and functional changes at the biochemical level of the neuron. Kandel, in this paper, shows that chronic anxiety and anticipatory anxiety in humans are closely paralleled by two forms of learned fear in the sea snail *Aplysia*: sensitization and aversive classical conditioning. He points out that in assessing anxiety in animals, one must rely on inferences derived from objective manifestations and that *Aplysia* manifests behavioral changes that by inference resemble anxiety. These observations and the fact that these marine snails have large neurons with nuclei that can be isolated by hand dissection make it a suitable model for anxiety in higher forms.

Dr. Kandel begins by defining the clinical syndromes of anxiety, in which he states, "Anxiety is a normal inborn response either to threat—to one's person, attitudes, or self-esteem—or to the absence of people or objects that assure and signal safety." He describes the objective and subjective manifestations of anxiety, and further states that anxiety can be adaptive or it can be dysfunctional. "Thus, anxiety is pathological when it becomes inappropriately persistent or no longer serves only to signal danger." Kandel correctly points out that little is known about the underlying cellular and molecular mechanisms of anxiety, and that the biological mechanisms that give rise to feelings of anxiety represent a central problem in the neurobiology of normal affective behavior. Kandel distinguishes chronic and anticipatory anxiety from panic attacks in that the former two are to some degree under stimulus control, which suggests that both are at least partially learned. That is, that they involve learning a relationship (or the absense of a relationship) between a neutral and a threatening stimulus. In spite of differences in concepts and language, and without reviewing the orgonomic concepts of anxiety here, Kandel's paper provides valuable data and insights for our understanding of patients and of our role as therapists.

Citing the works of many other authors, Kandel makes the case that both in animals and people what distinguishes signaled (anticipatory) from unsignaled (chronic) anxiety is that signaled anxiety is predictive

with respect to its cause, whereas unsignaled anxiety is completely unpredictive. Both are learned responses, just as are sensitization and aversive conditioning in animals. As with humans, *Aplysia* shows behavioral states resembling anticipatory anxiety (or fear) in response to a classical aversive conditioning paradigm, and chronic anxiety in response to a long-term sensitization paradigm. Using the well documented siphon and gill withdrawal reflex, the neural circuit was studied during sensitization by Castellucci and associates, and it was found that a stimulus which produces chronic anxiety in *Aplysia* leads to an enhancement of the connections made by the sensory neurons on their target cells: the interneurons and the motor neurons. It is postulated that a transmitter similar to serotonin (since serotonin stimulates the actions of this defensive arousal system) produces its amplifying action by increasing the intracellular messenger cyclic AMP. The increase in intracellular cyclic AMP in turn strengthens the connections of the sensory neurons by facilitating transmitter release from their terminals.

Based on pharmacological and biochemical studies, the biochemical steps that occur in sensory neurons when the behavior is modified by anxiety is formulated as follows: The propagation of an action potential towards the synaptic terminals of the sensory neurons initiates depolarization and opens the sodium channels. This results in further depolarization and the generation of an action potential at the terminal. This depolarization in the terminal opens up calcium channels and allows calcium into the cell. Depolarization also opens the potassium channels, which results in an influx of potassium and repolarization, which turns the calcium channels off. The activation of the sodium and potassium channels generates the action potential, determines its duration, and also activates the calcium channels and determines how long they will remain open. This is important to understand since the entry of calcium into the terminals is critical for transmitter release. It is thought that calcium allows the vesicles that contain the transmitter to bind to discharge sites, which is a necessary step for transmitter release. Serotonin and cyclic AMP prolong the action potential and thereby enhance calcium influx into the sensory neuron terminals. With more calcium available, more transmitter-containing vesicles are able to bind to release sites. As more transmitter is released, the functional output of the cell increases, and the animal shows the enhanced responsiveness that characterizes chronic anxiety in *Aplysia*. Further, Kandel and his colleagues have demonstrated that the molecular mechanism of the enhancement is protein phosphorylation which leads to a broadening of the action potential and a greater influx of calcium.

Sensitization in animals is a form of chronic anxiety in which a defensive arousal system is activated and increases the release of transmitter from specific identified synapses. Researchers have found by electron microscopy that in sensory neurons, like other neurons, synaptic vesicles are released at varicose expansions of the presynaptic terminal of the axon. These varicosities contain specialized regions called active zones, where the vesicles are loaded into release sites from which they subsequently discharge their contents, i.e., transmitters. Comparing sensory neurons from chronically sensitized with control animals, these researchers have analyzed the changes in the number and distribution of the synaptic vesicles and in the size and extent of the active zones. They found that the incidence of active zones and the aver-

age size of each active zone can be modified by anxiety.

Although it has not been proven experimentally, Kandel and his colleagues propose that a possible mechanism for these changes in the neurons, resulting from learning, might involve enduring, self-maintained alterations in gene expression. Kandel goes on to speculate further that neurotic illness such as chronic anxiety might represent alterations in synaptic function produced by experimentally induced modulation of gene expression. In addition, he believes that psychotherapy is effective and produces long-term changes in behavior in neurotic illness by producing alterations in gene expression. Kandel's view here is consistent with the modern theory that the major psychotic disorders, schizophrenia and depression, are heritable, unlearned, and do not respond to psychotherapy. In his view, they may involve alterations in the structure of specific genes, which unlike regulation of gene expression, are not altered by learning.

In the models used by Kandel to demonstrate the cellular interrelationship of chronic and anticipatory anxiety, he shows that both forms involve the strengthening of connections by modulating synaptic transmission. Both lead to enhancement of transmitter release by depressing a potassium channel and thereby increasing the influx of calcium. His studies suggest that there is a basic molecular grammar underlying the various forms of anxiety. He further suggests that normal learning, the learning of anxiety and unlearning it through psychotherapeutic intervention, might involve long-term functional and structural changes in the brain that result from alterations in gene expression.

It is fascinating to consider this new research in the light of our understanding of orgonomic concepts. From an orgonomic point of view, anxiety results when an energetic expansion is inhibited by contraction. We know that anxiety is the basis for repression and that muscular armor develops in order to reduce anxiety. Orgone therapy attempts to restore the natural pulsation of the organism by overcoming the chronic contraction in the various segments, since it is known that contraction in one segment will affect the unitary functioning of the organism as a whole. Reich believed that chronic armor produced structural changes in the nervous system and understood well the role of calcium in contraction. The current research appears to demonstrate some of the structural changes that occur at the biochemical and molecular level as a result of chronic anxiety and armor.

Louisa Lance, M.D.

ELECTROMAGNETIC HEALTH HAZARD

"Exposure to electromagnetic fields like those emitted by appliances and residential power lines apparently can affect behavior in laboratory animals and may increase the risk of childhood cancer, concludes a recently released report on a five-year program funded by the New York State Power Lines Project." These findings were reported recently (July 1987) in *Science News* (Vol. 132, No. 3, p. 39).

Although most of the research purportedly showed no effects from ELF (extremely-low-frequency) fields, some disturbing epidemiologic and laboratory findings emerged. In one study, which rated houses according to proximity to residential power lines and intensity of exposure, researchers found that in higher-exposure houses the risk of childhood cancer was 1.7 times that of low-exposure homes, and the risk of leukemia 2.1 times greater. In another study, pregnant rats and their offspring exposed to ELF showed learning deficits and neurological effects. In other studies, researchers reported that ELF magnetic fields actually decreased the length and severity of seizures in rats with epilepsy, and diminished the pain-killing effects of opium-like drugs.

As alarming as these findings are, they may represent only the tip of the iceberg. Apparently, it is not widely known that there are many studies documenting the biologically harmful effects of electromagnetic energy throughout a wide spectrum of frequencies and power levels. Thus these findings are not new, as the article might suggest, although they are evidently getting more public attention. A good summary of many of the studies done over the past several decades may be found in *The Body Electric*, by Robert O. Becker, M.D., and Gary Selden (Quill William Morrow, New York, 1985). The sources of energy showing harmful effects, according to Becker and Selden, include (partial list) power-line energy, radar, microwaves, radio waves, magnetic fields, and video display terminals.

These findings document a fact that has been known to orgonomy for a long time: that electromagnetic energy and orgone energy are antithetical. What is surprising in many of the studies is the remarkably low intensity of electric and magnetic fields that have been shown to have detrimental biological effects. This suggests that there are more subtle mechanisms at work than simply an oranur reaction between the EM energy and the biological orgone. In any case, it is clear that the recommended "safe" levels of exposure are inadequate and that even the most common household appliances (TV sets, CRTs, microwave ovens, etc.) are the source of potentially harmful electromagnetic fields.

Courtney F. Baker, M.D.

The Amateur Scientist in Orgonomy

This column is intended to encourage "hands-on" experience with various aspects of Reich's biological and physical laboratory findings, particularly for interested readers with limited means or access to sophisticated equipment. Each issue will feature an experimental research project that illustrates basic orgonomic findings using only modest equipment and expertise. Readers are encouraged to submit their own projects, including a brief theoretical background, a detailed practical description, references for further reading, and relevant diagrams or charts. It must be a project actually carried out as described rather than a theoretical design.

A GRASS INFUSION PROJECT

ROBERT A. DEW, M.D.

I. Introduction

The purpose of this article is to provide the reader with information on the practical necessities for the study of the grass infusion and, more specifically, to introduce him to methods that will enable him to follow the organization of protozoa from bion vesicles.

II. Background

The history of Reich's involvement with protozoa was discussed earlier in this journal (see Introduction to *An Air Germ Experiment*). Briefly, his initial interest was to observe the *cytoplasmic* streamings of these organisms, which he believed were related to the subjective "streaming" sensations reported by patients in erotic and other pleasurable states. He sought also to confirm the *generality* of the orgasm (tension-charge) formula in nature by discovering its manifestations in a simple living structure where, he reasoned, they should be directly observable. In the course of this work, he came upon the phenomenon of vesicular disintegration in the grass and the organization of protozoa, i.e., biogenesis. Reich's work with the protozoa bridged the gap between psychiatry and the basic biological research, which was to lead to the discovery of the orgone. The study of the origin of protozoa in the grass infusion, therefore, seems a highly appropriate beginning for those interested in biological orgonomy. It is entirely possible, even with a relatively unsophisticated microscope, to satisfy oneself as to the accuracy of Reich's description of the organization of the bion vesicles.

There is, in addition, apart from historic considerations, the pure pleasure and excitement to be had from simply watching the protozoa through the microscope. This has been a high point—for students and instructors alike—in every laboratory course in orgonomy. We are struck by the apparent "purpose" and "intelligence" exhibited by these creatures that have neither brains nor true nervous systems. What ultimately fascinates us so much in observing these organisms, I believe, is that we have a sense of being brought closer to the essence of living functioning in ourselves. The idea that, fundamentally, the same forces which govern them also govern *us* has tremendous impact. This alone will make this project worth the effort.

III. Apparatus and Supplies

Below is a list of the items that will be

needed for this project.* Additional explanation and detail will be brought out when we discuss how to make use of your equipment. A more complete description of the microscope appears at the end of this article in the Appendix. There is also a list of publications, which will prove extremely helpful and interesting.

1. Student-grade binocular microscope
2. One bottle of immersion oil with applicator: microscope dealer
3. Lens paper: microscope dealer or hobby shop
4. Clear glass slides (not plastic!), 1.0 mm thick (range: 0.96 to 1.06 mm), box of 100: scientific supply house
5. Several well slides (also called "microculture" slides in catalogues), single-well type, with well depth of 0.5 mm: scientific supply house
6. One box of clear glass coverslips ("micro cover glasses"), 18 mm square: scientific supply house
7. A package of disposable Pasteur Pipettes, and one rubber bulb: scientific supply house
8. One pair of needle-nosed forceps or tweezers, a pair of dissecting needles, and an X-Acto knife with No. 11 blades: hobby shop
9. One small pair of scissors (cuticle size) with straight blades and sharp points
10. Two or three finger bowls, four inches in diameter, two inches deep, from a scientific supply house; or certain kinds of short, wide-mouthed jars about 14 ounce capacity, such as jam jars, can be substituted.
11. Several panes of clear sheet glass, acrylic or Plexiglas, about 5 x 5 inches, i.e., large enough to cover the jars: hardware store
12. Alcohol lamp: hobby shop; alcohol: hardware store
13. Paraffin and petroleum jelly: supermarket
14. One gallon of distilled water: pharmacy
15. One inexpensive No. 2 paintbrush: hobby shop

* Most of the material listed can be obtained from Fisher Scientific, 191 S. Gulph Rd., P.O. Box J, King of Prussia, PA 19406; or Thomas Scientific, 99 High Hill Rd. at I-295, P. O. Box 99, Swedesboro, NJ 08085-0099.

IV. Setting Up the Grass Infusion

Collect the grass cuttings, being sure to include a mix of green and withered fragments. Wash them in a tea strainer under the faucet; use cool water with the tap wide open. Rinse with distilled water and pat the blades dry in a paper towel. Fill a glass bowl one-half to two-thirds full with distilled water, and push the cuttings—about a dozen half-inch pieces—beneath the surface. They may float, but this is of no concern; most of them will sink as they rot. Cover the bowl with a pane of glass. Mark the level of the water so that losses due to evaporation can be replaced accurately.

Protozoa feed on bacteria, algae, other protozoa, and disintegrating vegetable matter. An artificial habitat must, therefore, have time to "ripen" before the organisms will develop and survive. This simply means that it must be left standing while the grass disintegrates and bacteria, molds, etc., proliferate. Ripening takes three to five days; however, one should look at the *fresh* grass under the microscope, and on successive days, to see what happens to it as bionous disintegration proceeds. You may want to start another infusion later on for comparison, or one using a different kind of plant material, e.g., dried leaves. If there is a pond nearby, a little field trip to collect specimens could prove rewarding; you will most likely find

some species of protozoa which do not appear in the grass infusion. Try to collect a small amount of bottom sediment and vegetation with the water sample.

Most protozoa do best at around 65°F. The infusion should be kept out of *direct* sunlight but not in darkness, and away from radiators or heat registers; it should be safe from children, pets, or physical jarring.

V. Suggestions on How to Proceed

Start out with a 1/8-inch piece of grass from the ripened infusion; avoid the central vein. Use a flat slide and coverslip. Flatten the specimen and express the excess fluid from beneath the coverglass by applying pressure directly over the specimen with the wooden handle of a dissecting needle (Fig. 1). Begin with the lowest power objectives to locate and scan the plant material; then go to the 40x.

Your first look at the preparation will be fascinating, but probably also a bit bewildering. The major difficulty for anyone without a background in this work—even if he is already experienced in using a microscope—is simply *not knowing what he is looking at.* A wide variety of objects will be found in these glass bowls, including dust motes, pollens, yeasts, fungi, bacteria, and algae. You will be distracted by the many protozoa—some moving quite rapidly—which you may also have never seen before. This will not be the best time to attempt to follow the processes that Reich describes. Instead, take plenty of time just looking around. Make several preparations; sketch what you see in a notebook so as to compile a visual catalogue of the territory and its inhabitants. Then go through your textbook and identify what organisms you can. Even then, do not expect everything to become entirely clear. Since much of what you find will not be protozoa, you may want to get a book on botany to help you with recognizing the *flora* of the infusion. A well-stocked hobby shop will often carry inexpensive prepared slides of bacteria, algae, molds, pollens, etc. Though dead and stained, these provide a good idea of the sizes, shapes, and structures. As a practical experiment, you might allow dust to collect on a plate of glass for a week, scrape a sample onto a slide with a drop of water, and look at it under the microscope.

VI. Preparing Specimens for Examination Under the Microscope

There are three techniques for mounting specimens that you need to learn in order to observe the protozoa and their formation from bions:

1. Flat slide and coverslip
2. Well slide
3. Special mountings for long term observations

Each has its particular uses, advantages, and disadvantages.

A. Flat Slide and Coverslip

This is the most convenient method for examining specimens, particularly if they are thin or will spread out easily under the coverslip. The technique is illustrated in Figure 1. The advantage is that almost everything in the film of fluid under the coverslip is within a narrow focusing range, which makes it possible to focus down through the specimen. It is also easier to keep moving organisms in focus. The change to oil immersion is easily accomplished (see below) without losing objects of interest. The disadvantage to a coverslip is that thick or firm specimens will prevent it from lying flat, and air bubbles will be trapped underneath. Drying at the edges of the coverslip will sometimes result in its being sucked

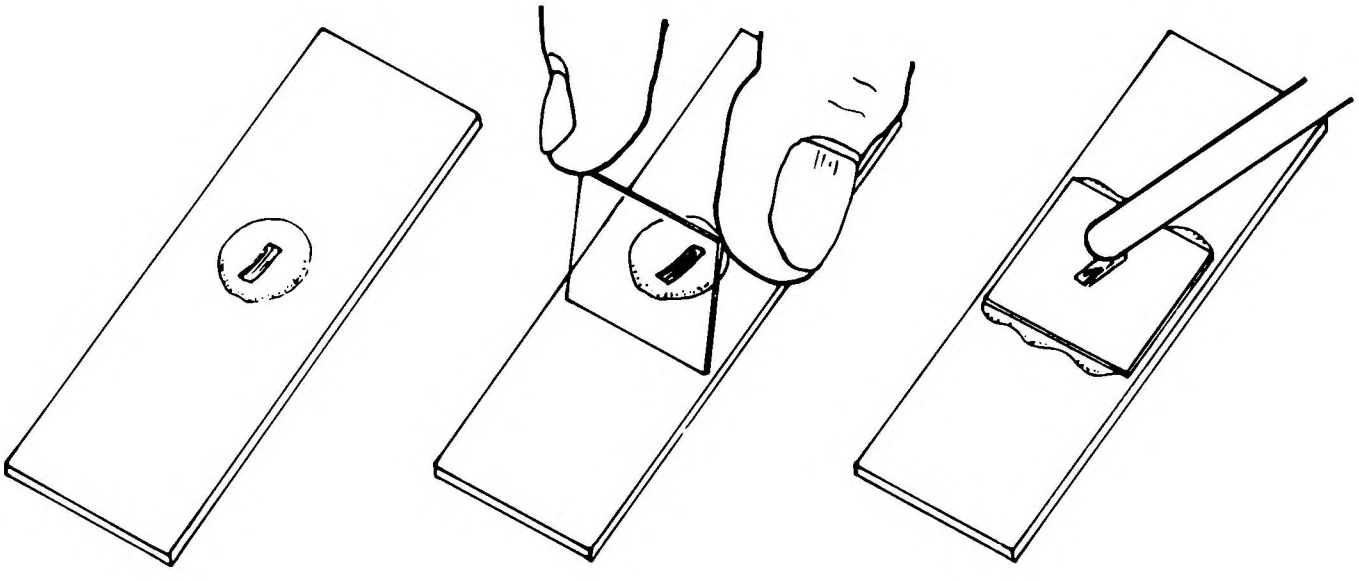


Fig. 1. The flat slide - coverslip combination.

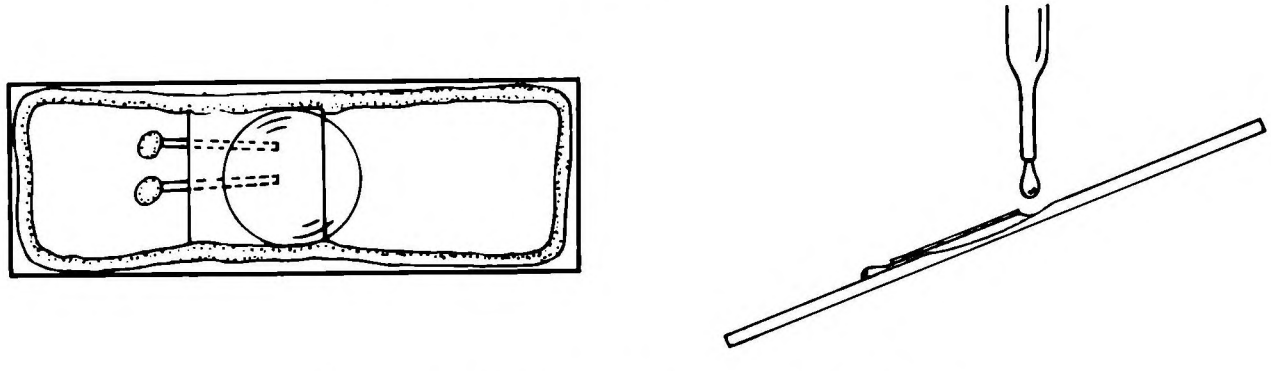


Fig. 2. The well slide - coverslip combination.

down on the organisms, causing them to flatten or burst. Flat slides and coverslips are not generally suitable for processes that require hours or days of continual observations.

The reasons for specifying a particular *thickness* when you purchase the slides and coverslips have to do with obtaining a clear, undistorted, and sharply focused image when you look at the specimen under the microscope. Too thick a slide will interfere with optimum use of the microscope condensor. The wrong thickness of coverglass can result in optical distortions with the 40x objective, and difficulty in focusing with the 100x. The proper thickness (in mm) is usually indicated on the side of the lens by the manufacturer.

Sometimes slides right out of a sealed box will not be clean. A good system for having clean slides ready is to put a dozen or so in a glass of distilled water which is covered with aluminum foil. When needed, just dry one with a paper towel. Both flat and well slides are easily cleaned and used again if one is careful not to let the specimen dry out on them. Coverslips are difficult to clean and should be discarded after use; they readily attract dust, so the box in which they come should be kept closed.

B. Well Slide

Well slides are useful for thick specimens and are the easiest mounts to prepare. They allow extended viewing times (two to three hours). Problems can arise if what you happen to be looking at is floating. Frequent adjustments of the stage and focusing may be necessary. Rapidly swimming organisms may be utterly lost from view. One is limited to high dry observations (40x objective) because a coverslip—necessary for oil immersion—will prevent focusing on objects lying on the bottom of the well. A water immersion objective, which can be dipped right into the specimen, bypasses most of these drawbacks.

C. Special Mountings

1. Well Slide-Coverslip Combination (after Reich) (Fig. 2)

An arrangement of this kind enabled Reich to follow and photograph the organization of the protozoa, a process which may take as long as two or three days. Once set up properly, the preparation is maintained simply by keeping the two areas on either side of the coverslip filled with distilled water. The slide may be kept on the microscope stage the entire time with the objective in focus, so that one can keep track of the same spot.

If one starts with fresh grass, weeks may pass before significant bionous breakdown occurs on the slide; so it is wise to use withered grass, or a blade from a three- or four-day old grass infusion. Transfer a piece about one-half inch long to a flat slide, along with a little fluid. Anchor one end with a dissecting needle and excise the central vein by making two longitudinal cuts with the knife. This will produce two narrow strips, each with a cut and an intact edge. Melt a pea-sized lump of paraffin in a spoon over the alcohol lamp, and mix in an equal amount of petroleum jelly. Remove the strips to the well slide and orient them across the lip of the well as shown

in Figure 2. Soak the end of the brush in the hot wax mixture and tack down the end of each piece with a droplet. Lay the coverslip down so that, on the left side, the anchored ends of the grass are exposed, and on the right, about a quarter of the well is left open. Paint a wax border along the top and bottom edges of the coverslip while holding it down: firm pressure may be applied with the wooden handle of the dissecting needle where the coverslip overlies the flat part of the slide. Continue the border all around the periphery. Tilt the slide up, as illustrated in the sketch, and drip water into the exposed portion of the well until the entire well is filled and the water runs out the opposite side. Put the slide on the microscope stage, focus the objective, find the location desired, and then fill the reservoir areas with water.

The obvious advantages to this setup are:

a) Unlimited observation time on the same specimen. It will last for months with only the addition of water and occasional repairs to the wax border where it sometimes separates from the glass.
b) It may be taken off the stage and kept in a covered jar, where evaporation is minimized between viewing sessions.
c) It is ready for use with the oil immersion objective.

2. Use of the Oil Immersion Objective

With a flat slide, the specimen lies in a thin film of fluid on which the coverslip may literally float. If the layer of water is very thin, its surface tension will bind the coverslip to the slide quite firmly. In most circumstances, however, it is free to move. If one then applies immersion oil to the top of the coverslip and lowers the lens into it, the surface tension of the oil may cause the coverslip to be drawn upwards. Any use of the focus knobs or mechanical stage will wreak havoc in the field of view. To use oil immersion with liquid mountings requires that the coverslip be fixed to the slide. This is easily done by tacking it down with a drop of the hot wax at each of the four corners.

The oil immersion objective should be used *at the end* of the microscopic examination of the slide, i.e., *after* the high dry lens. Once the oil is applied, it is hardly possible to remove it without ruining the mounting. This is quite different from histology slides in which the specimen is dead ("fixed"), stained, and embedded in a permanent mounting medium. It is also important to avoid allowing the oil to creep over the edge of the coverslip; if it gets underneath, it may obscure the specimen.

Oil Immersion Technique

a) Lower the substage condenser and apply a drop of oil to its top lens. Be sure to apply enough oil to cover the lens completely. Move the mechanical stage to a point where the slide will be centered over the slot in the stage. Apply a drop of oil to the *bottom* of the slide and mount it in the slide holder. Rack up the condenser until the two drops merge. This will

enhance the resolution of the image with the objective.

b) Apply a drop of oil to the front lens of the objective and to the coverslip. In this way, air bubbles will not be entrapped in the oil when the next step is performed. Rack the stage up (or the objective down, whichever the case may be) until the two drops merge, at which point a flash of light will be seen at the level of the specimen. *Do not do this while looking through the eyepieces;* look directly at the slide on the stage. *Then* look through the eyepieces and focus with the fine focus control.

VII. The Organization of the Protozoa

Up until now, your work with the infusions and other materials has been for the purpose of orientation. By familiarizing yourself with the contents of the infusion, you are in a better position to recognize certain processes and organisms that may have nothing directly to do with the organization of the protozoa per se. Now it makes more sense to focus your attention primarily on the grass itself and follow up on a suggestion made earlier under "Setting Up the Grass Infusion": Sample a fresh grass infusion from the beginning and on successive days. Note the original color and structure of the plant material and how these change. When disintegration has reached the point at which there is an accumulation of bionous material containing spherical formations or, if active protozoa are encountered, mount a strip of grass using the well slide/coverslip combination.* Try to find a location in the vesicular masses that looks promising—either a coalescence of vesicles, or the beginning of membrane formation, or even a clump of bions completely encircled by a membrane. Don't be too concerned about "catching something from the beginning"; there will be plenty of opportunities. Mainly what you want to do is get some idea of what goes on in the formations and how these events relate to the final outcome, i.e., how rotting grass turns into protozoa. It is entirely possible that some particular formation that attracts your interest will simply "do nothing," or will turn out to be only an encysting organism. Now that you have set up the grass for long-term observations, it will be possible to follow developments for hours or days if necessary to determine the result. There are, however, certain clues in the appearance and behaviour of the formation that might save you a lot of watching and waiting. Essentially, the problem boils down to making a "differential diagnosis" from amongst several kinds of structures which at first glance all look alike.

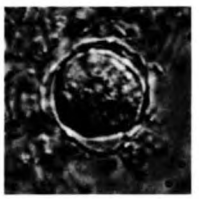
* You may at this point wish to review Reich's account and the descriptions appearing earlier in this issue of the *Annals*.

VIII. Differentiating Between Organization, Excystment, Encystment, and Simple Contraction

A chart summarizing the major features of these four functions—organization, excystment, encystment, and simple contraction—is presented below. It is clear that without considering the time element, it is *the state of the membrane* which says the most about the process under consideration. The absence of a membrane around the vesicles, or a membrane that is incomplete, slack, and unsmooth is the only "instant" indication that the process is most likely organization. Figure 3c, on page 38, of a developing amoeba shows this graphically; it resembles a "connect the dots" drawing. Examples of encysted and

Fig. 3. A photographic comparison of contracted and encysted protozoa. 640x. Nomarski DIC

a. Contracted amoeba. Note presence of vacuoles, two of which each contain an ingested algal cell. It lies against diatoms at the lower left.



b. A fully encysted protozoan: Note the thickness and irregularity of the pellicle surrounding the organism, giving it the appearance of a fried egg with a large yolk. The interior bion vesicles were compacted and motionless.

c. In this cyst, the multiple layers of the pellicle are readily visible. The central vesicles are distinct and were still moving at the time the photograph was taken.

contracted organisms can be found in Figure 3.

These clues notwithstanding, there is no substitute for extended observations. Actually seeing these various processes—in addition to their inherent interest—makes the distinctions with regard to organization of the protozoa even clearer. It is the only way to resolve one's doubts and concerns about interpreting what one sees.

At this point, you might choose to remain with a likely formation and follow its development into a protozoan. Leave the slide in position on the microscope for periodic examinations. Obviously, because of practical constraints, you cannot be witness to every moment of this process. As Reich points out, even with time-lapse photomicrography, many interesting details are lost. However, if one starts with grass from a ripe infusion and sets up the slide on, say, a Friday evening, in the course of the weekend it should at least be possible to see the formation of one organism to its completion.

Comparisons Between Organization, Excystment, Encystment, and Simple Contraction

Process	Duration	Membranes	Bion Vesical Motion		Structure	
			Vibratory	Rolling En Masse	External Cilia, Flagella, Etc.	Internal Contractile Vacuoles, Nucleus, Etc.
Organization	hours to days	absent, incomplete, wrinkled, fine	0→+	0→+	0→+	0→+
Excystment	1 to 2 hours	always present, typical of organism	0→↑	0→+	0→+	0→+
Encysting	———	always present, typical of organism	0→↓	+→0	+→0	+→0
Fully Encysted	1 to 2 hours	thick, often multilayered and irregular	slight or absent	0	0	0
Simple Contraction	less than 1 minute	always present, typical of organism	variable	0	+	+

Legend: 0 = phenomenon or structure absent
+ = phenomenon or structure present
→ = becoming; ↑ = increased or ↓ = decreased

APPENDIX

A Detailed Description of the Microscope

The specifications for the microscope given below may seem a bit formidable. But, if you keep in mind that most microscopes in the category you will consider borrowing or buying will already incorporate many of these features, then the problem of getting what you need will fall into truer perspective. The pleasure you derive from having this instrument will more than offset any of the difficulties you might encounter in acquiring it.

Of course, a good quality microscope is indispensable. How good it must be is a matter of what one can afford and what one hopes to achieve with it. Photomicrographic capability, for example, is generally quite expensive, and is further complicated in the present case by the requirement of photographing moving objects at high magnifications. For simple observation, a used student-grade binocular microscope of recent vintage, e.g., 10 years old, can be had for four or five hundred dollars. We recommend *binocular* rather than *monocular* because the latter type is very fatiguing to use for prolonged observation. As a bare

minimum, the instrument should include either a built-in or external light source with a rheostat, a fully adjustable achromat substage condenser (incorporating an adjustable aperture diaphragm), with a numerical aperture of at least 1.25, a smoothly operating mechanical specimen stage, coarse and fine focus controls, and a nosepiece that can be fitted with at least three objectives. If possible, it is desirable to have a magnification factor in the microscope tube or body so that one can achieve magnifications approaching 2000x using an oil immersion objective and 15x eyepieces.

a) Lenses

We are concerned here with *objectives, eyepieces* (oculars), and the *condenser*.This discussion is particularly relevant if one purchases a microscope without lenses, or with lenses unsuitable for our purposes. I am assuming that most readers will have limited funds available; the recommendations that follow are minimum requirements.

Objectives:

1. 10x or 20x (achromat) for scanning purposes. The low power gives a larger field of view so that one can cover the specimen slide quickly and completely to locate objects of interest.
2. 40x (achromat) high dry. This lens will be the most frequently used. A numerical aperture (N.A.) of 0.75 or better is preferred.
3. 100x (achromat) oil immersion, N.A. of 1.25.

Eyepieces:

15x wide field. If one requires glasses for astigmatism, it will be of benefit to wear them while using the microscope. In this case, *high eyepoint* oculars should be requested. Glasses need not be worn for simple myopia or presbyopia. It is vital that the eyepieces be *compensating*, a technical term signifying optical compatability with the objectives.

b) Condenser:

The condenser is often so mechanically integrated into less expensive microscopes that it may not be easily replaced. If this is the case, and one is purchasing the objectives separately, it is important to be certain that the condenser is optically compatible with them. This means that it must be capable of making full use of the *resolving power* of the objectives. Resolving power is the ability to distinguish fine structural detail in the specimen, and is indicated by a number called the *numerical aperture* or *N.A.* To take advantage of this quality in the objective, the N.A. of the condenser may be *no less* than that of the objective with the highest N.A. It is also in the interest of resolving power to have, if possible, a condenser with some degree of *correction* for chromatic and spherical aberration incorporated in its design. *Chromatic* aberration results in artificial color fringes around objects. *Spherical* aberration causes an inability to get everything within the field of view into sharp focus simultaneously; either the center or the periphery will be out of focus to some degree. The objectives recommended—all achromats—have some degree of correction or both. Most student 'scopes have *Abbé* condensers, which have neither correction. While this kind of condenser will in most cases be adequate, it would be better still to have an *achromatic* condenser. Lastly,

one wants to be sure that it will be possible to set up *Kohler illumination,** especially with the 40x and 100x objectives, because this kind of lighting provides the most intense and even transillumination of the specimen. This is also why a fully adjustable condenser was specified earlier.

c) Parfocality:

If at all possible, the three objectives should be *parfocalized.* This means that, as the microscope nosepiece is rotated to change objectives, each succeeding objective will automatically be in focus on the specimen. This is usually the case in microscopes that come with the manufacturer's objectives, or if all the objectives come from the same maker. Objectives of different origin may, however, be parfocalized in most instances by the dealer. The absence of parfocality is an inconvenience, making the job of focusing more troublesome, but it will not cause a degradation of the image.

A knowledgeable and conscientious dealer can be extremely helpful in these technical matters. One who regularly takes trade-ins will most likely have exactly what you want. There are some aspects of microscope design that haven't changed substantially in a hundred years; therefore, an older microscope stand, body, and nosepiece might be both entirely satisfactory and inexpensive. Since the advent of computers, lens design has progressed significantly; very good quality lenses are available today at modest prices. Fitting an older microscope with such lenses is not only feasible, but could result in an outstanding and versatile instrument.

Recommended Readings

1. *Photography Through the Microscope.* Kodak Publication No. P-2, Eastman Kodak Co., Rochester, NY.

   This book—available at most camera shops—is an excellent primer on how the microscope works and how to use it. It is indispensable in understanding the properties of objectives and eyepieces and, if the purchase of a microscope is being considered, a great help in knowing what to look for. And, of course, the subject of photomicrography is covered.

2. Jahn, T.; Bovee, E.; Jahn, F.: *How to Know the Protozoa,* 2nd edition. William C. Brown, Publisher, Dubuque, IA, 1979.

   This is a good, concise, clear, general text on protozoa with lots of information on their structure, function, classification and identification. There is also helpful information on how to prepare specimens for examination.

3. Reich, W.: *The Discovery of the Orgone, Vol. 2: The Cancer Biopathy.* New York: Farrar, Straus and Giroux, 1973.

   Reich's description of the organization of protozoa from bion vesicles will make what one sees under the microscope much clearer and easier to understand.

*Kohler illumination, explained fully in *Photography Through the Microscope*, is the best method for ordinary visual microscopy with most light sources.

Magical Child Matures

by JOSEPH CHILTON PEARCE

E.P. Dutton, Inc., N.Y., 1985. 236 pp., $16.95.

In 1977, Joseph Chilton Pearce published *Magical Child*, a book that evoked some critical complaint about its shrill claims, but which opened the eyes of many lay readers to the way our birthing and child-rearing practices fly in the face of nature and damage our children. *Magical Child* has been a best seller since its publication. *Magical Child Matures* is designed to take the reader through the developmental stages following childhood, showing the way to the full flowering of the human potential.

The path that Pearce follows leads ultimately to mystical "enlightenment." The question in this book is not primarily how to raise healthy children, but how to take them beyond healthy childhood to a state of maturity marked by spiritual transcendence.

The embrace of mysticism by an increasing host of Westerners calls for examination by psychiatrists in general and orgonomists in particular. There are obvious general causes: the distortions in value systems—material gratification attempting to assuage emotional deficits, individuals unrooted in family structures not knowing how to form families of their own, people doing meaningless, alienating work, etc., etc. The armies of those who feel empty of gratification and purpose must seek for something to fill the hollow spaces of their lives, whether with dope, manufactured excitement, or, in the case of those in whom cosmic longing still lives and sexual energy flows but cannot attain its object—mystical rapture. We live in an age of a world-wide blossoming of religious orthodoxies. The gurus travel by jet to attract the flocks back to the ashram. Obviously, they fill a need, and their message is attractive to multitudes.

Pearce cloaks his message in scientific trappings. His basic paradigm is that of the template which we inherit and the individual in the environment who enables us to potentiate the blueprint into actuality. Thus we have the templates for the full development of each of our senses, and our mothers, when they do right by us, enable each of the sensory modalities to unfold to its fullest. Likewise, we have the inner blueprint for learning language, and our mothers thwart or elicit our potential, depending on their ability to serve as "outward models." When he speaks of the genetic wiring of the newborn and the role of the mother in activating the child's potential, he is on solid ground. Many studies confirm this thesis.

His other foray into scientific substantiation for his argument lies in his correlation of developmental stages with the awakening of more highly evolved areas of the brain. He makes neat packages of functions of the reptilian brain, midbrain, and cortex. The handling of sensory data is assigned exclusively to the reptilian brain (whatever happened to the visual cortex?). The old brain brings in raw information, then organizes this information into meaningful categories, and the new brain "plays with structures built up through the other two systems." I cannot imagine that many brain physiologists would be charmed by this description.

In the first year of life, the sensorimotor functions are preeminent. From four to seven, the child's ego is equally distributed

between the three brains. If the reader has difficulty in visualizing the ego at this point and its even distribution, he is even more likely to encounter difficulties at age seven, when we move toward a point "where ego can act as though it were separate from the brain." Even greater things are in store, particularly after adolescence, given the proper guru. Pearce writes, "Through the subtle power of the post-biological development, our identity as an entity distinct from brain or body manifests and becomes stable. This is the spirit or soul." At this point, we have moved from the physical to the "subtle." When we move into the realms of the "subtle," the rules change. "Post-biological development gives us the ability to conceptualize directly out of the infinitely open blueprint realm. Conceptualization then becomes the criterion for reality."

Pearce is serious when he claims that the hallucinatory experience has the same validity as reality. He tells the story of an Englishman who set out to film the fakir rope trick in India. After a long search, he came upon a performance and set up his cameras. The fakir threw up his rope, which hung stiffly in the air. His assistant climbed the rope and disappeared from view. Then, as the horrified crowd watched, disembodied limbs fell to earth and were gathered by the fakir and reassembled into the shape of the assistant, to the great relief and delight of the audience. The photographer had witnessed the event and had been just as shaken and ultimately relieved as all the other members of the audience. When he examined his film, he was amazed to see that when the fakir threw the rope into the air, the camera recorded that it fell to the ground. Thereafter, it followed the crowd gazing up to the empty air, responding emotionally to the events to which it had been hypnotized. Pearce says that what the audience thought it saw is an equal reality to what the camera recorded.

To further convince his audience that reality is not as simple as it seems, the author presents an array of paranormal phenomena—fire-walking, spoon-bending, etc.—phenomena which allegedly defy reality. This display serves the clear function of loosening the boundaries of reality for the reader to set him up for the *Kazam!* of the guru and his garden of supernatural delights.

In retrospect, it appears that the message of *Magical Child* was not simply to enable the child to grow and develop freely and fully in the first years (free of armoring in our parlance). Pearce now writes, "We must use our biological system as the bridge by which we can pass beyond all biological systems. Point for point, each ability gained in early life becomes the means through which we develop the ability to move beyond all physical life." He continues ". . . the final section of nature's agenda: development of autonomous awareness. Only when we are no longer dependent on our bodies and the outer world for sustenance are we truly autonomous." On the other hand, espousing a position to which this reviewer is more sympathetic, Woody Allen states that reality is "the only place to get a good steak." For Pearce, the light of dream images, of flashing lights under psychedelics, is of the same order as a real image. He says that "to say that it is only illusory is to beg the issue." To which we reply, if it were true that reality and illusion are equal, then indeed, contemplating one's navel is as useful an activity as any other.

To Pearce, once we arrive at the point of eradication of boundaries, problems disappear. "If our years up to now have been for us a bad dream, all we are asked to do is

leave that dream behind. The post-biological path to maturation is a process of waking up. In no way are we required to go back into that dream and straighten out its mess. Once we make the shift to the new agenda, we can walk away from the dream with impunity."

Is there no wonder that such a program has a wide appeal?

How does Pearce arrange for the movement from biological to transcendent, and make it appear a natural progression? The key is the bonding model. He makes the distinction between bonding, a mid-brain function, and attachment, an old brain process, rooted in the stimulus-response pattern. He says, "The bonded mother is in touch with the precursive, intuitive state and meets needs ahead of time . . . This bonding function is the creative principle that holds a diverse creation together. Bonding is displayed from the appearance of the first unit of matter, the smallest subatomic particle, on up through galaxies and universes and our own brain/minds."

With proper development, we progress from bonding with our mothers and achieving all the maturation that she can help us to achieve, to bonding with our guru and the attainment of the spiritual growth which is beyond our mother's capability. Our guru helps us to hook into the universal flow and renounce the attachments to the things of the real world, stimulus and response.

"The progression through various evolving brain stages," Pearce says, "should lead us to a transcendent stage—away from the physical toward that state beyond existence, that point from which existence springs." He continues, "The problem lies in that shift of logic from existence to non-existence, or from locality to non-locality. But this, too, is a matter of development which is also built-in ready to unfold when given the proper teacher or model, and frame of reference."

There is abundant evidence that there is a wide proclivity among many humans to follow a master and to adopt his dogma. Reich discussed this matter at length in *The Mass Psychology of Fascism*. To assume that this disposition is of the same natural order as bonding with the mother is a leap of imagination lacking any validation. As a matter of fact, as Reich demonstrated, it is the failure of substantiation of individuality in the formative years that leads to the longing for leaders. We need gurus only insofar as we are flawed humans.

Pearce describes the experience attained when one meditates successfully and what he describes are sensory phenomena that continually unfold: sights that are more stunning than what one ordinarily sees, sounds that are more stirring than those we usually hear. He assumes that in this state, one touches God in oneself, that one is dipping into the source of creation.

To substantiate the thesis that this unconscious place is indeed the well of the creative process, he cites the famous instance of Kekule's dream of a hexagonal ring of snakes, which inspired him to discover the hexagonal benzene ring, the basis of organic chemistry. There are other instances of important scientific discoveries that were clued by dreams or other unconscious processes. Arthur Koestler pursued this theme in *The Sleepwalkers*, where he illustrated the fact that the great mathematicians Kepler and Newton made unconscious corrections of errors in their calculations and thus came to the correct answers. He assumed that somehow they knew the correct answers before they began their calculations.

But it is a far cry from Kekule and Newton and their unconscious sources to Pearce's visions. The great scientists do not

meditate their eureka experience. They are focused on specific problems, sometimes for years. They have given consideration to all possibilities within their reach, and some impossibilities. And only after this intense focus of attention and energy on a real problem does their unconscious affect the rearrangement which shows the way to the solution.

Pearce's visions are akin to the visions that LSD users used to describe. The drug-stimulated visual areas of the brain that caused visual perceptions. The hypnotic effect of the droned mantra, the yoga breathing, and the willing suspension of consciousness apparently have similar stimulating effects. One might also assume that there are energetic alterations in the body that are affected by these means, and that this adds to the pleasureable nature of the experience. To assume that the delights of the hall of mirrors in which the meditator is entertained is the place of Creation is self-delusion. We have not heard of the guru who discovered a benzene ring. The most that Pearce can tell us of the guru is that "With his left eye he sees within the realm of God; with his right eye he sees the outer world of fragmentation and folly."

One hopes that the guru has a more balanced view of the outer world than the one that Pearce entertains. To him, the outer world, a product of the failure of people to bond successfully, is a place of total counterfeit culture. He cites the heartbeat broadcast in the newborn nursery to quiet the crying infants as the prototype of this culture. Everything real is phoney. And the attempt to right what is wrong in the culture only entraps us into further investment in the culture. This jejune, enervated view of life is less than we would have expected from one in regular contact with the Godhead. Bach, Leonardo, and Michelangelo lost none of their lust for life after having been touched by God. If the discovery of the double helix structure of DNA, a cultural phenomenon, were to be forsworn in favor of the dazzling lights of the cross-legged meditator, this would indeed be a world of folly.

Another illustration of the imbalance of Pearce's pronouncements: There are studies indicating that the accumulated average scores testing "intelligence" in breast-fed babies is higher than that of bottle-fed babies, and remains higher for several years after breast-feeding is discontinued. The studies argue that breast-feeding enlivens the awakening of the mental processes of infants. Pearce, citing these studies, states, "The breast-fed child is always more intelligent than the bottle-fed child, and the longer he is breast-fed the more intelligent he is."

This is patently untrue, but more than that, it is dumb. Visits to the source of creation should touch us with a mite of wisdom. Pearce posits that most of the neurons of our neocortex are unused because they await spiritual activation by our guru, but we should hope that some of the remainder are still awake to common sense.

Pearce recognizes the ceaseless and futile struggle to correct the "dysfunction" of the world by altering components of culture. He also recognizes that the changes must be effected within us, so that we relate in a different way to the world and to one another. His path to that change is through meditation and "modeling" with the spiritual conduit.

As can be imagined, sexuality based on biological function alone is proscribed. In the yogic view, sexuality is paired with Kundalini, the process of spiritual development. One is presumed to advance from sexual lust to deep love of the sexual object to the love of God, and thence, through sexual abstinence, to the ultimate state of

enlightenment.

Armoring has many manifestations. Some are obvious, like the physical tensions in muscles, the dysfunction in organs, the symptoms of psychosis and neurosis, and the aberrations of character. Others are more subtle, like the service of misguided "causes," the adoption of unfounded philosophies. The realm of delusion and self-delusion is as wide as the world of armored man.

For those for whom love, work and knowledge are impaired sources of their lives, there is, so long as there is some energy extant, a search for something to give substance, satisfaction, and ease to their existence. The clubiness of the mystical brotherhood, the solitariness of the pursuit and its narcissistic gratification, the titillation of the new sensations, and the delusion that one is at the heart of mysteries will be beguiling to many. For this reason, one cannot simply dismiss *Magical Child Matures* as a foolish book of a deluded author. Because of the many readers who will be persuaded by its scientism and the promises of mystical ticklings, it is a dangerous book.

Morton Herskowitz, D.O.

The Origin of Consciousness in the Breakdown of the Bicameral Mind

by JULIAN JAYNES

Houghton Mifflin Company, Boston, Mass., 1976. 467 pages.

It would be unfortunate for anyone to be put off by the forbidding and academic title of Julian Jaynes's *The Origin of Consciousness in the Breakdown of the Bicameral Mind.* Although scholarly, the text is lucid and lively throughout; the author writes with grace and wit. More significantly, if Jaynes is correct, this is a very important book.

The central thesis is startling. Consciousness, the sense-of-self that we get when we become subjectively aware of ourselves, is a relatively recent invention—no more than 3,000 years old! Jaynes explicitly challenges the conventional assumption that consciousness developed in the prehistoric era when *Homo sapiens* evolved from the primates. Thus, civilization was created by people who never introspected, never agonized over decisions, never pondered their destiny, and never suffered a moment's uncertainty.

They had a different mentality, the bicameral mind, which did not include consciousness. Early man acted mostly out of habit. In new situations where habit wouldn't suffice, people heard "voices," actual auditory hallucinations, which they unquestioningly obeyed. They took these voices to be the voices of their gods. The story of this bicameral mentality, its decline, and the emergence of consciousness is Jaynes's subject.

What Consciousness Is Not

In redefining consciousness, Jaynes sharply limits its boundaries.* Consciousness is not all of mentality. Sensation is not part of consciousness, since we constantly perceive sizes, shapes, and colors without introspective consciousness. Similarily, we sit, walk, and move outside of consciousness. Nor is consciousness a copy of our experience, since what we can consciously recall is but a thimbleful of the vast ocean of our actual knowledge. In Jaynes's view, concepts are possible without consciousness, for the bee has a concept of a flower, and the eagle a concept of a sheer-faced rocky ledge; but neither the bee nor the eagle is conscious.

Consciousness is not necessary for learning. Primitive learning such as Pavlovian conditioning demonstrates this point. In the learning of new skills, consciousness provides motivation and the goals to be reached, but is noncontributory to the actual learning. For example, consider learning to play the piano or hit a tennis ball. Jaynes argues that problem-solving can also be learned without consciousness.

He also maintains that consciousness is not necessary for thinking or reasoning. Citing a key experiment done in 1901 by Karl Warbe, in which a subject was to make a simple judgment between two identical-looking weights to determine which was heavier, he argues that, although judgment was embedded in the consciousness of the problem, its materials, and technique, there was no conscious content

*We are conscious much less of the time than we think we are. It is difficult to realize this because we cannot be conscious of time when we are not conscious.

for the actual judgment itself.

Here Jaynes introduces a new term, *structions.* Structions are like instructions given to the nervous system, that, when presented with the materials to work on, result in the answer appearing automatically without any conscious reasoning. This phenomenon applies, he argues, to most of our activities, from judging weights to solving complex scientific and philosophic problems. The role of consciousness is to study a problem and prepare a struction; solutions then appear as if out of nowhere.

And finally, consciousness is not localized in the "head" or behind the eyes. Jaynes reminds us that although we use our brains in consciousness, it is arbitrary to locate consciousness "in the brain." We use our brains in riding a bicycle, but no one would say that the location of bicycling is inside the head.

What Consciousness Is

An analog is a model; at every point, it is generated by the thing it is an analog of. For example, a map is an analog. Each region of a district of land is allotted a corresponding region on the map, although the materials of the land and the map are different, and many of the features of the land must be left off the map.

Subjective conscious mind, according to Jaynes, is an analog of the real world; consciousness, in every way, parallels the behavioral world. Every word we use to refer to mental events is a metaphor or analog of something in the behavioral world.

Consciousness is not a thing or a repository, but an operator. It "operates" on the real world just as mathematics "operates" on quantities. It is intimately involved in volition, decision-making, retrospection, and imagination.

Consciousness is built up with a vocabulary of terms that are all metaphors or analogs of behavior in the physical world. We "see" solutions to problems that are "brilliant" or "fuzzy." A mind-space is generated by metaphors of actual space whereby we can "approach" a problem from some "viewpoint." So, something can be at the "back" of our mind. Jaynes's theory is that such metaphors are not mere comparisons between the real world and consciousness but, instead, that the metaphors actually created consciousness. Thus, language must precede consciousness both in world history and in the developing child.

Mind-space is one of the key features of consciousness and, within this mind-space, an analog "I" automatically develops to do this mental "seeing." This analog "I" is contentless, and is not to be confused with the psychologic "self," which is an object of consciousness. As the bodily "I" moves around in the environment, so the analog "I" learns to "move about" in the mind-space, concentrating on one thing or another.*

Narratization, is a third feature of consciousness, whereby consciousness is constantly fitting things into a story, putting a "before" or "after" around any event. Other features of consciousness include: *concentration,* an analog of external perceptual attention; *suppression,* by which we stop being conscious of annoying thoughts, the analog of turning away; *excerption,* the analog of how we sense only one aspect of a thing at a time; and *consilience,* the analog of perceptual assimilation.

*For instance, we are out walking and we arrive at a fork in the road. Our analog "I" can imagine what we might discover following either the left or right path, and then a choice is made.

The Bicameral Mind

Jaynes studied the *Iliad* in search of characters narratizing with an analog "I" in a mind-space, and making decisions in this conscious way. He found no one sitting down and making decisions, no one introspecting, and no one reminiscing. Whenever a significant choice was to be made, a voice came in telling the individual what to do. These voices were always immediately obeyed, and the voices were attributed to gods. This is the mentality of the bicameral mind; a mentality of two parts, one a decision-making part, the other a follower part. In his everyday life, early man was a creature of habit, but when some problem arose that needed a new decision or a more complicated solution than habit could provide, the stress of decision-making was sufficient to instigate an auditory hallucination. Because people had no mind-space in which to question or rebel, such voices had to be obeyed.

Jaynes theorizes that the bicameral mind first appeared around 9,000 B.C., coincident with the beginning of agriculture. Society was moving from small, hunter-gatherer groups to large, agriculturally-based towns and cities, and a new kind of social control may have been needed. In small groups, the chieftain was always present. In larger towns where the leader could not be simultaneously present for everyone, the bicameral mentality enabled individuals to carry around with them the directions of the chief as verbal hallucinations. The bicameral mentality suggests a rigidly organized, hierarchical society with strict expectancies organized directly into the mind. The hallucinations, therefore, preserved the social fabric. Jaynes describes hierarchical theocracies in the Near East, Egypt, Greece, India, and Central and South America. All these early civilizations were thoroughly religious and heavily dependent on gods and idols, and Jaynes found evidence of bicamerality in each. In Mesopotamia, the head of state was a wooden statue with jewels in its eyes, perfumed, richly raimented, and embued with ritual. The king was really the first steward of this statue god.

Jaynes studied cuneiform tablets to discover that people came to their idol-statues, asked them questions, and received directions from them. Evidence from various sources suggests each individual had a personal god. Although Jaynes describes many differences amongst bicameral societies throughout the Western world, all appear to have been strict and stable religious hierarchies in which everything worked like clockwork, providing there was no real catastrophe or problem.

The Breakdown of the Bicameral Mind and the Origin of Consciousness

The stability of bicameral mentality was precarious. Overpopulation from agricultural success led to social complexity. In the second millennium B.C., there were huge natural catastrophes, such as the eruption of Thera, which destroyed or dislodged entire nations. Large migrations and the development of trade resulted in cultural "mixing." Another cause of the demise of bicamerality was writing itself; such broadly used writings as Hammurabi's code weakened the power of the auditory directions.

By 1400 B.C., the consequences of bicameral breakdown appear in graphics. Gods are no longer depicted, and in some cases, kings are shown begging in front of empty gods' thrones; nothing like this had ever happened before. The *Ludlul Bel Nemequi,* written about this time, begins:

My god has forsaken men and disappeared,
My goddess has failed me and keeps at a distance,
The good angel who walked beside me has departed.

With the loss of the gods' voices came the idea of heaven as the place where the gods had gone. Angels, messengers between heaven and earth, appear, as do evil gods and demons. Jaynes claims there is no evidence of angels, demons, or heaven prior to the very end of the second millennium B.C. By 1000 B.C., people in Babylon were walking around draped in amulets and charms to protect themselves from a huge variety of demons. Divination, methods of discerning messages from the gods, developed. Throwing lots, dice, the movements of smoke, oracles, and astrology all appear on the social scene. Jaynes views all of divination and the major role played by prophets and oracles as a desperate quest for authorization by people not capable of self-authorization.

Solon, a Greek in 600 B.C., was the first person who talked about the mind as we might. He said, "know thyself." Jaynes uses Greek literature to detail the invention and learning of consciousness on the basis of metaphor and analogy by tracing words like *phrenes, cardia,* and *psyche.* The meaning of each of these terms changes over time from a thing or object to a mental function. For instance, *psyche* was originally simply the property of breathing or bleeding.

Jaynes uses the Bible to support his thesis. The Book of Amos dates from about 800 B.C., and demonstrates bicameral mentality. Amos was a "left-over" bicameral person who could hear the word of Yahweh. Amos was a shepherd boy, not a wise old man, who didn't even know what a prophet was. But periodically, he burst forth with "Thus sayest the Lord," and then out poured many of the most powerful passages of Jewish history. By contrast, the Book of Ecclesiastes, from 200 B.C., demonstrates developing consciousness: "I saw in my heart that wisdom excelleth folly..." (Ecclesiastes, 2:13).

Vestiges of Bicamerality

Jaynes sees many vestiges of the bicameral mind in the modern world, such as the persistence of divination, prophets, the phenomena of possession, poetry, hypnosis, and schizophrenia. Concerning hypnosis, he says,

For if our contemporary mentality is, as most people suppose, an immutable genetically determined characteristic evolved back somewhere in mammalian evolution or before, how can it be so altered as in hypnosis? And that alteration merely at some rather ridiculous ministrations of another person? It is only by rejecting the genetic hypothesis and treating consciousness as a learned cultural ability over the vestigial substrate of an earlier more authoritarian type of behavioral control that such alterations of mind can begin to seem orderly.

Schizophrenia, says Jaynes, began in human history as a relationship between an individual and the divine god, and only around 400 B.C. does it come to be regarded as the incapacitating illness we know today. Some of the fundamental symptoms of florid, unmedicated schizophrenia are consistent with bicamerality. These symptoms include auditory hallucinations, the loss of the analog "I," and the loss of the ability to narratize.

Jaynes concludes with a chapter on the auguries of science. He views the Scientific Revolution as a wandering after final

answers, a search in nature for the authorization lost when the bicameral mentality broke down. He sees the possession religions, astrology, meditation procedures, scientology, Marxism, psychoanalysis, and behaviorism as expressions of a longing for certainty and authorization. In each of these, the adherent receives a world view, a hierarchy of importances, and an auguring place where he or she may find out what to do and think. These "scientific" total explanations of man and reality are obtained not by actually explaining everything, but by a restriction of attention, so that everything that is not explained is not in view.

> *In this period of transition from its religious basis, science often shares with...a hundred other irrationalisms, the same nostalgia for the Final Answer, the One Truth, the Single Cause...and all of this...is a part of this transitional period after the breakdown of the bicameral mind.*

Throughout the millennia, since the breakdown of bicamerality, there has been a longing for lost innocence, splendor, and certainty. Jaynes sees this theme in Plato, Rousseau, Marx, Freud, and, alas, in Julian Jaynes. The book concludes:

> *It [the book] began in what seemed in my personal narratizations as an individual choice of a problem with which I have had an intense involvement for most of my life: the problem of the nature and origin of all this invisible country of touchless remem-berings and unshowable reveries, this introcosm that is more myself than anything I can find in any mirror. But was this impulse to discover the source of consciousness what it appeared to me? The very notion of truth is a culturally given direction, a part of the pervasive nostalgia for an earlier certainty. The very idea of a universal stability, an eternal firmness of principle* out there *that can be sought for through the world as might an Arthurian knight for the Grail, is, in the morphology of history, a direct outgrowth of the search for lost gods in the first two millennia after the decline of the bicameral mind. What was then an augury for direction of action among the ruins of an archaic mentality is now the search for an innocence of certainty among the mythologies of facts.*

Critique: General Comments

Most of the reviews of *The Origin of Consciousness in the Breakdown of the Bicameral Mind* have been unsatisfactory. Several writers dismissed the theory as preposterous and refused to consider it seriously. Others have chosen to make nitpicking objections and criticisms, while overlooking the project as a whole. There has been a tendency for "experts" to balk at Jaynes's polymathic incursions into their specialized domains. A few reviewers have offered unqualified praise without justifying their zealous views. Those familiar with the history of orgonomy recognize such responses to revolutionary ideas.

Jaynes is addressing what he calls the "awesome chasm" between what we know about consciousness and what we see in anatomy lab when we dissect a body. How can the human body be the seat of all this introspection? If a scientist wishes to explore this question, he must stretch his imagination, because the problem is simply incomprehensible when it is thought about in habitual ways. An explorer in this realm must be bold and speculative; Jaynes seems to relish the uncertain seas. We must remember that speculation can lead to interesting stories and some of these may

be testable.

Jaynes has been criticized for not "proving" his theory. Whereas it is true that no single piece of evidence will be found that definitively proves his hypothesis, it is also true that, in the case of ideas such as evolutionary theory or the bicameral theory, one proceeds differently. One gathers all the data possible, evaluates it, and sees how it fits into the theory. In evaluating the bicameral theory, one studies ancient texts, artifacts, and some current mental phenomena. The theory must explain the data more completely and more simply than any alternative theory. The scope of Jaynes's project is such that ultimately it will be the archaeologists, anthropologists, historians, psychologists, linguists, historians in religion, and experts on the classics who will refute or verify the thesis. To his credit, Jaynes's theory is testable.

Even from Jaynes's harshest critics, there is considerable praise for his book. Everyone acknowledges its fresh approach to old and unsolved intellectual questions; the reader finds himself thinking of things that he had never considered before.* One gets a thrilling sense of the sweep of history. Perhaps most important, in a book devoid of sentimentality, Jaynes helps the reader feel the poignancy of the human condition and our empathy is expanded.

Criticism of Jaynes's Concept of Consciousness

Jaynes believes his most important idea is the nature of consciousness itself, i.e., that consciousness arises from the power of language to make metaphors and analogies. This idea is central to the practicing orgone therapist. In character analytic work, we are addressing the patient's consciousness, but that term has been so loosely defined that it is often mired in ambiguity. Jaynes's redefinition is more narrow, precise, and accurate. His exclusion of concepts from consciousness is in keeping with our therapeutic experience. Individuals have unconscious concepts of authority figures, of their "self," of men and women, and a world view, all of which shape and guide their behavior repetitiously and unconsciously for decades. Some of these concepts are pathologic and are the characterologic and mental aspects of armoring; the neurosis is anchored both in the somatic armor and characterologically in these rigid, unconscious concepts.

Jaynes's carving away at the traditional view of consciousness led him to differentiate between sense perception and consciousness. Sensation exists throughout the animal kingdom; if we include it within consciousness, we inevitably must impute consciousness to protozoa. If this happens, we cannot use the term consciousness to help demarcate what it means to be human. Therefore, sensation and consciousness must be separate. Sense perceptions, in humans and throughout the animal kingdom, direct and guide countless events and behaviors outside of consciousness.

The exclusion of concepts and sensation from consciousness reaffirms Reich's idea that life functions in a basically rational manner without consciousness. The notion that conscious intellect and sophisticated reasoning are rational while all "lower" mental functioning is "irrational" is nonsense.

Jaynes's idea that consciousness is an operator or operation with an analog "I" moving through a mind-space and narratizing stories is an almost palpable model.

*Even as you criticize him and disagree, you realize that you are becoming more aware of what consciousness is and is not.

It gives the orgonomist a strong theoretical framework for character analytic work that seeks to change a patient's consciousness. For instance, when a patient is in contact, the orgonomist asks him to make verbal associations to a thought, feeling, spontaneous memory, or dream. In doing so, the therapist provides a struction which stimulates consciousness. The orgonomist listens carefully to see how the narratization proceeds, to see what is excerpted or suppressed, or how consilience occurs. This demonstrates how the individual's character functions, and particularly illustrates his cognitive patterns. The therapist can then point out aspects of character.

As the therapist comes to understand the patient's consciousness, the patient can then be taught to use his own consciousness as a tool in his efforts to overcome his own armoring. For instance, the patient who typically avoids conflictual situations can learn to focus his consciousness on aspects of his daily life which had previously been suppressed or not excerpted.*

One measure of the usefulness of a model is its ability to generate testable hypotheses and questions that can be studied. I believe Jaynes's model provides these for character analysis. Perhaps armor in specific segments causes particular types of consciousness. Specific character types may tend to narratize in predictable patterns. How can the orgone therapist use Jaynes's ideas to loosen and increase the spontaneity of the compulsive's consciousness, or structure and stabilize the schizophrenic's consciousness? How and when is consciousness used defensively to discharge energy in a substitute fashion? How do we most effectively help our patients expand their consciousness so they can change their behavior to bring about more gratification in their loving and working?

Jaynes doesn't say much about the relationship between his theory and emotional disorders, but, at the McMaster-Bauer Symposium, he maintained that neurotic behaviors are disorders of consciousness, and that narratization and excerption must be retrained. This is only partly correct, and brings us to a serious objection. Orgonomists frequently see fully analyzed and cognitively retrained patients who remain emotionally miserable. Jaynes doesn't understand armoring or the energetic basis of emotional disorders. He doesn't recognize that sensation is the filter through which both the internal and external world become manifest to us, and that the quality of our sensations determines the quality and types of our perceptions and judgments. All the concepts mentioned earlier, such as world view, the "self," etc., are shaped by the degree to which our internal and external sensory apparatus have become partially blocked by armor. Indeed, orgonomists, psychoanalysts, and behavioral and learning theorists all agree that these crucial concepts are learned by the developing child *before* introspection develops.

Jaynes also fails to recognize the effect that blocked orgone energy, expressed as disrupted emotions, has on consciousness. His book conveys the impression of a calm, collected, controlled consciousness coolly retrospecting, imagining, or planning activity. What of a consciousness so flooded by anxiety it can't think? What of the compulsive's rigid, dull consciousness, unable to even consider a more flexible behavioral pattern? Therapists know that undischarged energy, desperately seeking expression, often seizes a person's con-

*I would emphasize the prerequisite that the patient's ocular segment be relatively clear for this "homework" to be productive.

sciousness and carps derisively, spoils pleasure, constrains impulses, and ingrains guilt.

There is much about the relationship between sensation and consciousness that is not clear, and Jaynes's theory is incomplete. For instance, perception can inhibit consciousness, and vice versa. Often we close our eyes to think more clearly, and if we're conscious of being conscious, we tend to hold our breath. What are the energetic implications of this complex interaction? Clinically, we often see people with such intense sensations they are unable to consciously recognize their behavior and accurately assess their situation. This is often true of schizophrenics and impulse-ridden characters, and is seen in hysterics, at times.

In summary, I find that Jaynes's theory of consciousness provides an important foothold in a very slippery terrain; it should be very useful to orgonomists in the theory and practice of character analytic work. I accept Jaynes's idea that consciousness is an analog of the individual's real world. But, what he does not recognize is that the real world, which includes our internal and external environment, is accessible to our mental life and to consciousness only through our sensory apparatus. Any time armor disrupts that sensory apparatus, it will have a major impact on consciousness. His theory also fails to account for the impact of undischarged orgone energy on consciousness in emotionally disordered individuals. Neurotic behaviors are thus disorders of the entire organism, not just of consciousness. Reich's bioelectric experiments verify this.

Criticism of Bicamerality

Jaynes's second idea is the hypothesis of the bicameral mind, an early type of mentality, characterized by habitual behavior, auditory hallucinations of gods in times of stress, and the absence of a capacity for introspection. I am not able to thoroughly evaluate this idea. Experts in Greek literature, the Bible, hieroglyphics, and cuneiform must study the relevant data. My interest in this idea is not clinical, but theoretical; what light, if any, does bicamerality shed on the origins of armoring?

I have several layman's reservations about the bicameral mind. First, the development of civilizations is a very complex process. It is very difficult to imagine people accomplishing this feat without the sophisticated reasoning, learning, and thinking we associate with consciousness. Second, there is no evidence to support significant structural change within the brain in the last three to four millennia. Therefore, any change in mentality would be a change in "software," i.e., in the way sensory information is processed, rather than a change in brain "hardware." Third, it is always risky to use pathologic individuals in formulating theories about healthy individuals. In the text, Jaynes uses schizophrenics and patients who have had commissurotomies to support his ideas. Particularly in regard to schizophrenia, he selects aspects of the illness that support his position, but omits other aspects that might challenge his stand.

On the other hand, there is much to support the idea of a bicameral mind. We do have two cerebral hemispheres, and there is growing evidence that intuitive, as opposed to deductive, reasoning is located in the non-dominant temporal cortex. It is fairly well established that the non-dominant hemisphere processes information in synthetic fashion, and that it is the superior hemisphere for fitting together block designs, parts of faces, and musical chords. This is exactly the kind of integrative functioning which would have been

most useful for early man to "hallucinate" about. One of the strongest arguments for bicameral mentality with hallucinations is the countless descriptions in different languages and different cultures of the gods talking to people. The more you think about *The Origins* and the figurines drawn in the text of men talking with their gods, and the more you think of Amos and the "Iliad," the harder it becomes to discount Jaynes's thesis. Finally, it is undeniable that early men did worship gods and idols as if they were a living presence in their lives. Our religions today are vastly different; I know of no explanation other than a major change in mentality that can explain this phenomena.

Jaynes's bicameral man fits nicely with Reich's ideas about animism. Bicameral man appears to have animated his gods by projecting his own sensations and experiences into his gods and then reexperiencing them through auditory hallucinations from the gods. This animism is closer to reality than the mysticism which followed; for in animism, at least man has some direct contact with his gods. This particular mentality and religion provided early man with an emotionally simple, peaceful life. There was no mortality, no identity crises, and no anxiety over conflicts. But, bicamerality or animism is not fully healthy. Mankind is not free, but vulnerable and at the mercy of his gods. Here it is difficult to reconcile Reich and Jaynes.

In *Cosmic Superimposition*, Reich theorized that man had the power and the capacity to be fully free. Reich argued that, at some point in his development, man began to reason about his own sensations and about his ability to perceive himself. This amazed and frightened man, and he turned against himself. Here, Reich uses the schizophrenic experience, just as Jaynes does! The "turning against himself" was a split between sensation and perception, which caused man to view his own sensations as "objects of attention" and as something alien or not his own. If Reich is right, perhaps it was pre-bicameral man who experienced this mental process. Consciousness was developing, was very nearly present and established; but man became frightened, and armored against inner fright and amazement by splitting sensation and perception. Living in small hunter-gatherer groups, he turned the responsibility for his life over to the hands of a leader and then, as Jaynes says, bicamerality evolved as groups became too large to be controlled by an always present chief. In this case, bicamerality is pathologic and a flight from health.

In Jaynes's view, bicamerality is not pathologic, but simply a stage in mankind's mental development. The earliest men, then, were perhaps healthy in the same sense that animals are; lively, with little armor, and with the capacity for self-regulation of their energetic needs in uncomplicated situations. But without consciousness, they lacked the intellectual capacity to adjust to change. As hunter-gatherer groups moved to agricultural towns, innocent, consciousless man was lost. The bicameral mind developed as a means of bringing control and order to society, not because man was running from freedom or frightened of his orgastic sensations, but because he was lost and desperate, too intellectually undeveloped to control his life or to live freely. If so, the bicameral mind is a step toward, not a step away, from healthy, natural, fully free functioning.

Criticism of the Origin of Consciousness

Jaynes's third major idea is that consciousness followed the bicameral mind, roughly between 1400 B.C. and 600 B.C.

Again, experts in various fields must verify or refute this module of Jaynes's project. From the orgonomic perspective, this theory fits comfortably into ideas Reich expressed in *Ether, God and Devil.* There can be no arguing with the fact that the externalization of religious impulses described by Jaynes actually occurred. "My God, my God, why hast thou forsaken me?" has echoed ceaselessly through the last two millennia. Reich called this change mysticism, the changing of religious, sensory, bodily impulses into something unreal, unknowable, and beyond this world. As contact with one's sensations is replaced by a supplicant attitude toward the gods in heaven, angels, demons, morality, and all sorts of mystical amulets, charms, and divination appear.

Jaynes's book confirms Reich's ideas about the realm of the devil. As the gods disappear, mankind experiences a great longing for being embraced again by "the eternal," and the concepts of "sin" and the "devil" arise as explanations for the lost contact. The greater the loss of core contact, the more desperate the outward search for authorization. Over and over, in civilization after civilization, Jaynes shows how the development of consciousness resulted in certainty being replaced by internal debates between "good" and "evil," and an oscillation between faith and rebellion that has characterized modern man. The last two millennia have been characterized by this mystical religion, and by a science which has studied the stars and the atom but has shunned the study of nature *within* man. Thus, Jaynes's text strongly confirms Reich's earlier concept that consciousness is the root of man's greatest armoring.

In the auguries of science, Jaynes suggests we are near the end of both the externalization of religious impulses and of the Scientific Revolution, which seeks the lost authorization in the study of external nature. The tremendous challenge ahead is that the human species must become its own authorization, and to do so we must look *inward.* This view echoes Reich's in Chapter VIII of *Cosmic Superimposition.*

Knowledge of god and knowledge of the universe will follow from knowledge of one's self. Consciousness, as described by Jaynes, will be a crucial tool in this pursuit. Just as fundamental a tool will be man's sensory apparatus. Through the ages, consciousness and sensation have not been in harmony. This must change, and Reich has pointed the way:

> *All this has nothing to do with mysticism. It has to do exclusively with keeping our sensory apparatus, the tool of our research, in good condition. This condition is not a "gift," not a special "talent," but a continuous effort, a continuous exercise in self-criticism and self-control.**

Orgonomy can be a great asset in facing this challenge, but we must heed Jaynes's warning and not allow ourselves to mystify Reich or orgonomy, thereby creating another pseudo-science or pseudo-religion which offers a false and all-too-comforting authorization:

> *In return, the adherent receives what the religions had once given him more universally: a world view, a hierarchy of importances, and an auguring place where he may find out what to do and think, in short, a total explanation of man. And this totality is obtained not by actually explaining everything, but by an encasement of its activity, a severe and absolute restriction of attention, such that everything that is not explained is not in view.*

David Schwendeman, M.D.

*Reich, W.: *Ether, God and Devil—Cosmic Superimposition.* Farrar, Strauss and Giroux, New York, 1979, p. 96.

Communications and Notes

The Institute for Orgonomic Science wishes to thank the many generous supporters who enabled the purchase of the Zeiss Axioplan photomicroscope in the spring of 1987. The microscope was delivered to us in April and was used for some of the photographs seen in this issue of the Annals. We thank you for your generosity and support for our work.

A weekend laboratory course for laymen was held at the Institute in May 1987. Topics covered included biogenesis, elementary bion work, the Reich Blood Test, and principles of orgone physics. The next course for laymen will be offered in May 1988. Persons who are interested in applying for this course should submit their applications as soon as possible to the Institute, as places are limited and offered on a first-come-first-served basis to qualified applicants.

The Institute, in its continuing research on the Reich Blood Test, performs the test free of charge for those individuals recommended by their therapist. For information please contact: Louisa Lance, M.D., Box 304, Gwynedd Valley, Pa., 19437.

Educational Programs

The Institute conducts ongoing educational and training programs for medical students, physicians, and laymen which include:

• *Somatic and Psychic Biopathies:*

This course is offered to third- and fourth-year medical or osteopathic students and physicians. It is designed to enhance the student's classical understanding of disease processes through an in-depth exploration of Reich's pioneering work in these areas. This course is not limited to students interested in becoming medical orgonomists. Applicants must be undergoing characterologic restructuring and be recommended by their therapist.

For further information, write: The Institute for Orgonomic Science, c/o Robert A. Dew, M.D., Box 304, Gwynedd Valley, Pa. 19437.

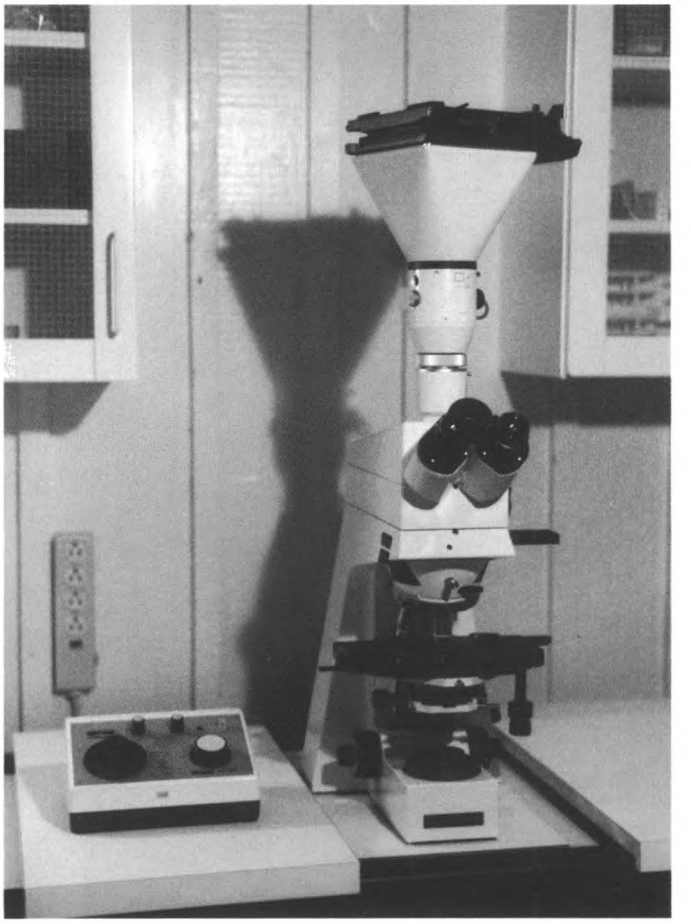
• *Training Program for Medical Orgonomists:*

Applicants for this program must be undergoing characterologic restructuring with an approved therapist, be interviewed by one or more training therapists, and have completed (or be in the process of completing) their first year of a psychiatric residency. Candidates for training are required to complete the biopathies course, advanced laboratory course in biogenesis and orgone physics, and the clinical didactic course. Training then continues with the monthly clinical seminar given by the Institute, and with individual case supervision.

For further information, send a resumé that includes biographical data, classical and orgonomic training, and therapy, to: The Institute for Orgonomic Science, c/o Robert A. Dew, M.D., Box 304, Gwynedd Valley, Pa. 19437.

• *Laboratory Course Offerings*

Introduction to Scientific Orgonomy: For the student without a strong scientific background, a two-day, weekend course in the fundamentals of biogenesis and orgone physics is offered twice a year. The course includes lectures, laboratory work, and demonstrations. Enrollment is limited to 10 students. Course fee: $200. The next course will be offered in May 1988. If you are interested in taking the course, send a brief resumé to the Institute, including scientific background (if any) and experience in orgonomy.



The Zeiss "Axioplan" photomicroscope recently acquired by the Institute.

Advanced Laboratory Course in Scientific Orgonomy: This course is designed primarily for physicians and students with a strong scientific background (it is also open in selected cases to those who have completed the two-day course). It is a more comprehensive, four-day course in biogenesis and orgone physics, with lectures, laboratory work and demonstrations. Enrollment is limited to 12 students. Course fee: $350. If you are interested in taking this course, send a brief resumé of your scientific background and experience in orgonomy to the Institute.

Manuscripts

The *Annals* invites the submission of articles on any of the several aspects or orgonomy. Manuscripts must be sent in triplicate (the original and two copies) to the *Annals of the Institute for Orgonomic Science,* Box 304, Gwynedd Valley, PA 19437. They should be typed on one side of white paper, double spaced, with margins of no less than one inch. A letter should be included indicating the category of the paper and should provide the name, address and telephone number of the author. The title page must include the following information about the author(s): first name, middle initial, and last name; academic degree(s), occupation, and institutional affiliation (if any). An abstract of 150 words or less—also double spaced—is requested, stating what was done, the results obtained, and conclusions reached. References should include only those actually cited in the paper and are to be listed and numbered in the order of citation. Within the article itself, references are indicated numerically in parentheses on the line of typing. Journal references should include the author(s), title, name of the journal, volume, page numbers, and year. In the case of books, the name(s) of the author(s) and editor(s), number of the edition, name of the publisher, city of publication, and year are required. The format indicated below should be followed:

1. Baker, C.F., Dew, R.A., Ganz, M., Lance, L.: "The Reich Blood Test," *Journal of Orgonomy,* 15: 184-218, 1981.
2. Reich, W.: *Character Analysis,* 3rd edition. New York: Orgone Institute Press, 1949

Tables should be typed double spaced. Figures and graphs should be scaled to fit within a 5¾ x 8½ inch format. All should be clearly labeled. Manuscripts accepted for publication are subject to copyediting. They become the property of the Institute for Orgonomic Science and may not be reproduced without the consent of the authors and the Institute.

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