Impulsing: The Electricity of the Nervous System

How Impulse Activity in the Conscious Pathways Forms Consciousness

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A Study on (Physical) Feelings

The Study that led to Impulsing: The Electricity of the Nervous System began when, as a teen, I wanted to know how the muscle tensions we call our feelings, happen. At the time, as many of us do, I took things hard. My feelings often felt stuck. And since I equated my feelings with my quality-of-life, when found the Nervous System was responsible for all conscious experience, I began a study to understand how the System worked at this level, so I could learn to restore and maintain emotional balance.

I started the study by looking at the System's circuitry as being made up of linked neuron groups – and then focused on tracing impulses, as they form impulse trails, throughout this circuitry. And proposed these impulse trails, called impulsing, do different work, some of which we can relate to, as different areas of the System are energized.

Then, with the circuitry and impulsing in mind, I inferred the System's general work is to monitor and resolve the simultaneous conditions or states the body is exposed to, in order to maintain balance within and between the body's physiological functions.

And since I was interested in what we call our feelings, I applied *impulsing* to an inner circuitry of the System, the conscious pathways. And proposed the monitoring and resolving work done that we're aware of, and experience as consciousness. In other words, we are conscious of the work *impulsing* does at this level of the Nervous System, and for monitoring, we can use *impulsing* to see how sensation is experienced; how a record is made of each sensation, and thought, in a network of records. For resolving, we can see how this network becomes a filter thru which simultaneous states converge to derive resolutions we call thoughts.

The study went on to propose that each sensation and thought is followed by a muscle tension pattern, their physical counterpart, having the same pattern of tones. And when the sensation ceases or the thought is resolved—i.e. when the sensation or thought is no longer present, the tension pattern is released. And as the muscle relaxes, we feel this reversal of tension as a kind of balance we call emotional balance.

On the other hand, when the tension pattern isn't released, the increased tension signifies a need for change or resolution. And when the tension is prolonged, it catches our attention, as the muscle's nutrients become depleted, resulting at its most intense, as emotional pain.

Of course, as this tension increases, when we understand the activity in the conscious pathways that leads to a resolution, we can use this insight to generate a resolution that leads to releasing the tension—and that contributes to the ongoing stress and release pattern that we feel as emotional balance.

In effect, the fluency of conscious monitoring and resolving work in the conscious pathways is reflected in the ongoing patterns of muscle tension and release we feel. So when each tension pattern is followed by its release, we can say the System is working fluently—and we are doing what it takes to stay in sync with how this part of the System functions well.

And again, since I think our feelings, in large part, determine our quality of life, I believe understanding how this part of our body works is as important to our overall well being as understanding how any other of the systems making up the body works.

Tracing impulses

The Backdrop: The Structure of the Nervous System

• The Nervous System—a circuitry of linked cell assemblies—is the central system of the integrated systems that make up the body. This System, interfacing other systems, such as the Respiratory and Circulatory Systems, is responsible for coordinating the work within and between the systems—to maintain a constant state of functional balance—homeostasis.

• The Nervous System's cell assemblies are made up of specialized cells, called neurons, having many branches—often including one that reaches from its assembly, to other assemblies.

• Beginning in the body's tissue, the circuitry starts with sensory cell assemblies—groups of specialized receptor neurons—embedded in the body's tissue, such as light and sound waves, where they are exposed to forms of energy—such as light and sound waves, touch, temperature and muscle tension.

• The branches of these sensory neurons reach inward, to unite with branches of other assemblies to form the diverging and converging pathways that reach to, and makeup nerves and spinal cord. They then connect upward to diverge to, and converge on arrays of dedicated specialized assemblies that are packed together to form the brain.

• From the brain, branches reach back to assemblies, eventually reaching back through pathways to sensory assemblies embedded in body tissue—to complete circuitry.

Tracing Energy — Impulsing in the Circuitry

• As sensory assemblies absorb the energy they're designed to, a pattern of the assembly's neurons is energized and the assembly's character is updated to reflect the new conditions. In effect, sensory assemblies steadily monitor conditions they are exposed to.

• The energized neurons of each assembly then immediately translates the energy it's absorbed into another form of energy—electro-chemical energy—also called impulses. A pattern of impulses—a trailhead—and is then instantly generated to the next linked cell assembly in the circuitry-and so on, as if jumping from one group to the next through the circuitry.

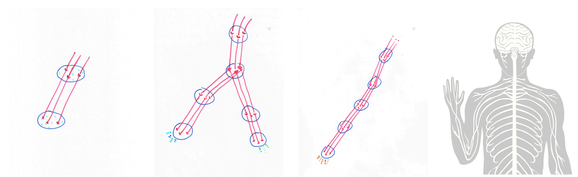
• So, as each assembly absorbs a pattern of impulses, its character changes and is expressed to further integrated groups, each of which monitors and resolves current incoming impulse patterns.

• Then when impulse trails from different sources converge on the same cell assembly and energize the same pattern of neurons—the pattern they have in common is defined—and forms a resolution. At the same time, the convergence of energy on this pattern of neurons increases—and when the pattern's energy is intensified, it's dominant and it propels a strong pattern of impulses (a trailhead) to further groups in the circuitry.

• So as patterns of impulses are propelled from group to group, the resulting trail of energized neuron groups through the linked cell assemblies, forms a lightning-like trail—an impulse trail.

• In this way, absorbed of energy (monitoring) and converging energy (resolving,) form self-sustaining impulse trails throughout the circuitry—that drive the System's work. And circulation is maintained in the circuitry.

***Impulsing: Electric-like* trails evolve in the circuitry**



• As it absorbs energy, each pattern of energized neurons generates its pattern of impulses to the next neuron group in the circuitry (1)

• When impulse trails converge on the same cell assembly and energize same pattern of neurons—the pattern in common is dominant and is reinforce (2)

• As dominant patterns of impulses are propelled from group to group, the resulting trail of energized neuron groups forms a lightning-like impulse trail (3)

• In this way, the absorption of energy (monitoring) and its convergence (resolving,) form self-sustaining impulse trails (4)

About --> tracing energy (in the form of impulses) --> through the Nervous System

General & Specific Work Proposals

The General Work of Impulsing in the Nervous System: To Monitor and Resolve

With the organization of the circuitry and impulsing in mind, we can infer that the System's primary work is to monitor and resolve the simultaneous states the body is exposed to, to coordinate the body's functions to maintain functional balance at all levels.

• To do this, first, since sensory cell assemblies constantly absorb forms of energy that reflect the current states or conditions, we can infer that a key function of this System is to steadily monitor the states the body and environment is exposed to.

• Secondly, when impulse trails come into a neuron group that monitors the same conditions, they converge on a pattern they have in common. And this pattern defines the solution or resolution that keeps that function coordinated—balanced, in light of the conditions present. So we can infer that another key function of the System is to steadily resolve the simultaneous states in the body and environment that the body is exposed to.

• So with impulsing, as cyclic patterns of evolving, diverging and converging impulse trails are sustained throughout the circuitry of dedicated neuron groups (representing integrated functions,) the body's health is routinely supported.

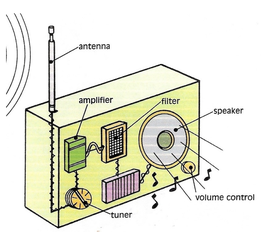
• In summary, the general work of the Nervous System is to constantly monitor and resolve the states the body is simultaneously exposed to, to support homeostasis, coordinating balance, within and between the body's integrated systems.

The Specific Work of Impulsing In the Conscious Pathways: ***Experiencing Monitoring and Resolving work at the level called Consciousness ... As trails through the thalamus form a Stream of Consciousness—Instant By Instant***

• In this model, we focus on the work impulsing does in an inner circuitry of the Nervous System neuroscientists have identified as being associated with aspects of conscious experience.

• In fact, we experience the monitoring and resolving work, as it's occurring in this inner circuitry. We're aware of monitoring and resolving work being done—as consciousness.

• So the theory focuses on the monitoring and resolving work we're conscious of—in an inner circuitry of the System. This is the work of impulsing that forms the conscious stream--as a stream or series of impulse trails enter and energize the thalamus--a set of neuron groups packed together near the center of the brain-- So we'll see how we experience sensation, record experiences, derive thought and as the tension patterns we call feelings, we'll see how they reflect how well the System is balanced at this level.



• Just as electricity does certain work as components of a radio are energized, we can follow the work impulsing does as areas of the System are energized. And to help relate impulsing in this System to its conscious counterpart, we can give it a visual character, by relating it to film (5)

• As each impulse trail passes & energizes the central group of conscious pathways-the thalamus-we experience a singe instant of consciousness-like a frame is added to a reel of film. And like frames on a reel of film, conscious instants also blur together to form a seamless experience (6)

• Specifically, impulsing in this inner circuitry of four linked areas, does four kinds of conscious work: that contribute four kinds of conscious instants to the formation of an evolving conscious stream. These four kinds of conscious instants are sensation, recognition, thought and patterns of muscle tension we call feelings.

Overview: Four kinds of conscious instants

• **Sensation**: When sensory assemblies generate trails that reach the thalamus, we experience sensations that monitor conditions in the body and environment

• **Recognition/Orientation**: As we experience a sensation or thought, a record of fused neurons, representing its qualities, fits into a network of records that began early in life. And as it fits in, its energy goes on to energize any other record made in the past also having those qualities—causing a sense of recognition and orientation. This is sometimes called the fringe effect. In this way, current conditions are related to those experienced in the past.

• **Thought**: As areas of the network are energized and gather, they often overlap on a pattern they have in common. This reinforced pattern is a resolution that is experienced as a thought.

• **Feelings**: Sensations generated from the muscle landscape steadily monitor the presence of changing patterns of muscle tension, so they are a form of monitoring. More specifically, since they reflect the specific tonal patterns that correspond to current sensations and thoughts, they monitor the presence of these conscious instants in our body (giving them a physical form) and continuously adjust as sensation and thought changes. These tension patterns we call our feelings makeup the fourth kind of conscious instant. So for this model, feelings are defined as distinct muscle tension patterns that range in intensity from subtle (light) to sustained (strong.)

• To review, with impulsing, we can mentally follow the lightening-like trails of impulses as they evolve, diverge and converge in the four areas or neuro-architectures of the conscious pathways. And when we apply impulsing to these areas, we'll see how four kinds of conscious instants are formed and contribute to the ongoing conscious stream we call consciousness.

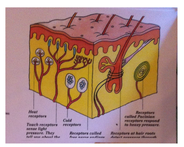
• To summarize, the energy that is absorbed by sensory neurons, and drives this System, is electro-chemical energy, also called impulse energy or impulses. When they form lightening-like impulse trails, or impulsing, in the circuitry, we can follow this energy to see the work it does in terms we can relate to.

Now we'll trace energy, in the form of a generic impulse trail —beginning where it enters the system →

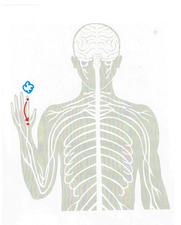
Impulsing in Area 1 of Conscious Pathways: Experiencing Sensation

See how something tangible—this System—forms something intangible—a sensation

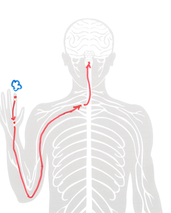
The neuron assemblies that makeup Area 1 of the conscious pathways begin with the sensory cell assemblies embedded in the body tissue and reach to a set of neuron groups packed together near the center of the brain—the thalamus



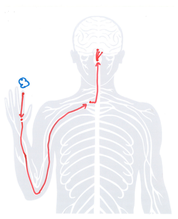
• When an embedded sensory assembly, in the skin for example, absorbs a pattern of energy from the body or environment--such as the light pressure of a cotton ball--a pattern of the assembly's neurons is energized (7)



• And as each new pattern of energy is absorbed, the assembly's character changes—like the sound changes as different members of a choir hum a different set of musical notes. The sensory group then generates a pattern of impulses to the next linked neuron group in the circuitry (8)

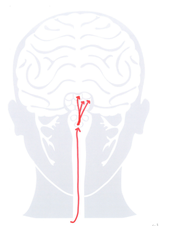


• So each sensory assembly expresses its character, as a pattern of impulses, to the next linked group--to update its character--which in turn expresses its new state to the next group, which in turn expresses its updated character to the next, and so on, one after another, through the circuitry (9)



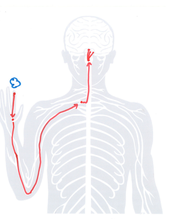
• So a lightening-like series of energized neuron groups is often formed from a sensory assembly to the thalamus

• On reaching the thalamus, the trail's impulse pattern splits to energize a set / combination of thalamus groups. These groups represent the component qualities making up a conscious instant—a combination of both sense specific and in-



• A sense-specific quality is unique to a single sense, such as the color blue is unique to the visual sense. An Inter-sensory quality, such as soft or sharp, is often found in the makeup of many different senses—the quality soft is a component quality in the makeup of a soft breeze, soft sound, soft scent, soft touch & so on.

For example, if we see an image



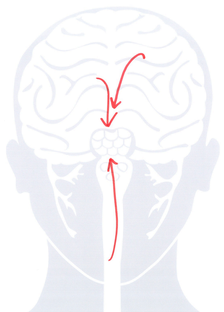
• As energy is absorbed, and forms (carves out) a series of energized neuron groups, that reaches the thalamus, occurs so quickly that the energized groups are experienced simultaneously, in us, as a unit. And together, we experience a sensation.

• The sensation we experience depends on the source of the trail reaching the thalamus and

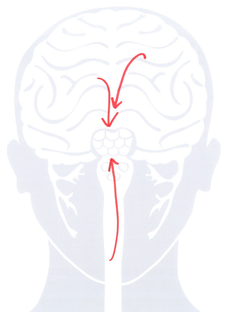
ter-sensory qualities (10)

of clouds in the sky, the energized groups represent the qualities of blue and gray, as well as softness and edginess. (11)

the combination of its groups that are simultaneously energized ... from the sensory group source to the thalamus group (12)



• A key corollary of the Impulsing model is: each impulse trail that passes and energizes the thalamus, puts a single instant of consciousness into the evolving conscious stream. The impulse trail can come from either the sensory areas or from the cortex that covers the brain's surface (13)



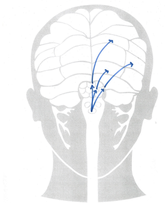
• The particular conscious instant we experience depends on the source of the series of energized neuron groups reaching the thalamus.

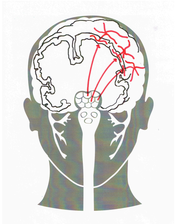
• When a trail enters the thalamus from the cortex, a thought enters the currently evolving conscious stream. Since this trail to the thalamus is shorter than from a sensory assembly, the experience of a thought, although distinct, is less vivid (13+)

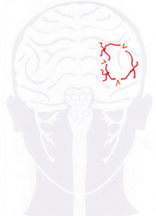
Impulsing in Area 2: Forming a Record: Experiencing Recognition & Orientation

See how the impulse trail of a sensation forms a record and energizes related records made in the past

Neuron assemblies making up Area 2 of conscious pathways begin with the (central) thalamus groups and reach to the cortex—the layering of neurons covering the brain's surface







• As a pattern of impulses leaves the separate areas / groups (qualities) of the thalamus, the impulse trail diverges to reach areas of the cortex that correspond to the qualities that make up the conscious instant just experienced

• The impulses in these areas then spread over the cortical surface through a layer of neurons. The impulses in these areas then spread over the cortical surface through a layer of neurons.

• Impulses from opposite directions converge and fuse (14)

• In effect, this dissolves the walls/borders between these neurons, forming a perm. pattern of fused neurons. Any other current record having qualities in common, also fuse to form an enlarged record. Fused patterns provide routing through which impulses can freely travel, so, in the future, energy into any part of this pattern flows into (and accesses) any other part of the record, or another record sharing quality(s) (15)

• This pattern of fused neurons (representing its component qualities) is now a permanent record of the trail that just passed and energized the thalamus. So it is a record of the conscious instant that was just experienced, which fits, by way of its component qualities, into a network of records we began forming early in life. This is a spatial record of a single instant. When spatial records are linked together, one after another, they form a temporal record (16)

• So the trail's energy is used to form a record that fits into a network of past records by way of the current record's qualities.

• And after a trail's energy is used to form a record, the trail's residual energy diverges outward, and sinks into this network through past records by way of the current record's qualities--giving us a quick, instantaneous sense of recognition and orientation (17)

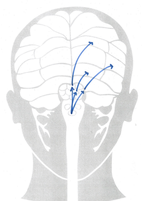
• This energy sinks into the network of records, for as far as the trail's leftover energy penetrates into records--the network of records having any of the new record's qualities in their makeup. So if a component quality of the new record is "blue" all records made in the past have "blue" in their makeup are energized, and if there is another quality, the past record is doubly energized. And re-energized if the conscious instant is repeated (18)

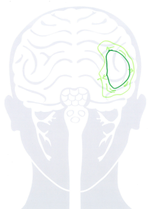
• In this way, the remaining energy in a record goes on energize records made in the past—having any of the current record's qualities in their makeup. The area of related records that is energized varies depending on the intensity of the trail making the record and the networking available. When an instant is repeated, the added intensity enlarges the energized area (18+)

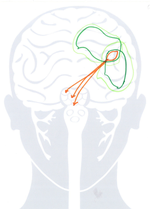
Impulsing in Area 3: Experiencing Thought

See how gathering current and past instants forms new resolutions!

The neuron assemblies that makeup Area 3 of the conscious pathways begin in the cortex and reach back to thalamus







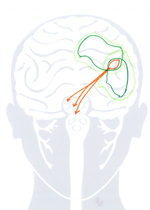
• After an impulse trail makes a record of each sensation and thought in the cortex, the trail's inherent energy goes on to energize its related networking—the networking the record just fit into. This is how current conscious experiences energize related records made in the past, to in effect, put those related records on-call (19)

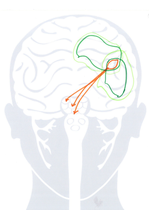
• The area or extent of related record networking that are energized varies, depending on the intensity of the energy the trail forming the record sinking into the networking.

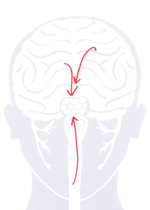
• Additionally, when a sensation or thought is repeated, energy is added into the same area of the networking expanding the area of energized related records even more (20)

• Energized areas of networking gather. And when two or more areas overlap and energize a common pattern, this reinforced pattern—a trailhead—generates an impulse trail back to the thalamus—and we experience a thought

• As we'll see, larger areas of energized record networking make it more likely that a common pattern is derived. (21)







• The shared pattern that is reinforced when two or more energized areas overlap is, in effect, a resolution. It's a definition of what the energized areas have in common—how they are related

• There are 3 kinds of thoughts formed in this way. (22)

• The first converges on the original record; a memory. The second defines a present resolution; such as thoughts we derive when we are reasoning. The third kind is a projected resolution, i.e. what a resolution would be if resources present in the past (forming resolution) were available

• And when the energized areas of networking that gather, but are not used in forming a resolution when we are awake, are resolved when we are sleeping—they are spun into stories that use the inherent energy. We call these stories dreams. And when we awake, the energized areas are gone and

• When new thoughts are continuously "fed-back" to re-enter the cortex and overlap with other energized areas—generating another new thought back to thalamus—we call this thinking (22+)

we feel the sense of having a clean slate (23)

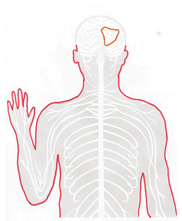
Impulsing in Area 4: Forming and Releasing Tension

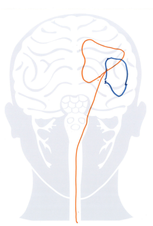
See how patterns of muscle tension are formed—reflecting current sensations and thoughts—and when released, leave a sense of emotional balance

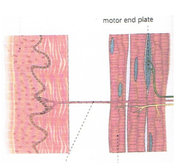
The linked neuron assemblies that makeup Area 4 form a sub-circuit in the conscious pathways: It begins with sensory cell assemblies in the tissue of the muscle landscape, and reaches inward, first to the thalamus, and then to the cortex, where connections reach back to the muscle and then, through pathways, back to the thalamus

In this area of the conscious pathways, we'll see how patterns of muscle tension are formed to reflect the presence of current sensations and thoughts … and then released—a reversal of tension reversal we feel as a kind of balance, we call emotional balance …

In the aftermath of sensation and thought—patterns of tension and its release are routinely experienced as emotional balance or emotional wellness.







• From early life, records are made, matching the state of each integrated muscle, along its stretch continuum from loose to tight, to the corresponding sensation/tone it elicits, from soft (or light) to sharp (or intense.)

• Also, at any one time, current sensations and thoughts in the conscious stream energize their related networking, including their tones/sensation.

• When this networking and the current muscle networking overlap on

• After each sensation and thought generates a corresponding pattern of tension, the length of its reflective tension, before it's release, determines the feeling we experience.

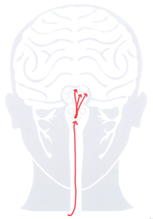
• So the longer this tension pattern stays energized, the

• Since the presence of integrated muscle making up this 3-d landscape is constantly expressed, their related networking is steadily being energized.

• So the potential pattern of tones elicited in/by the muscle landscape is vast. (24)

a common pattern of tones, the pattern is highlighted. And this reinforced pattern of tones is expressed to its counterpart in the muscle landscape—forming pattern of tension (25)

more the muscle's nutrients become depleted. And as the pattern's tension intensity increases, the more intense / greater the tension we experience. (26)



• The resulting tension pattern entering pathways to thalamus puts the sensation of muscle tension, which we experience as a feeling, into the conscious stream--causing us to feel a subtle pattern of tension that varies from subtle (felt as a need) to intense (felt as emotional pain) depending on how long the sensation or thought is present. (27)

• So the reflective tension pattern stays as long as the sensation or thought is present. It physically reflects their presence in the body.

• Then when the sensation is no longer present, or the thought has been resolved, the muscle relaxes. Its reflective tension to muscle is released.

• As the muscle relaxes, we feel this reversal of tension as a kind of balance we call emotional balance. The depth of relief we experience depends on the amount of intensity reversed / released, (28)

• When we're able to maintain constant balance, second-by-second, in this part of the Nervous System, we experience a sense of ongoing well-being.

• Routinely maintaining this sense of emotional balance reflects the terms of healthy functioning in this part of the system. And maintaining balance in this part of the System helps us stay in sync with how well the entire System functions well. (28+)

This description of how feelings are formed and released in everyday consciousness is the explanation I was looking for when I began this study—which I hope will help us to routinely restore and maintain this aspect of our body's health—to achieve a sense of emotional balance.

Summary: This is how feelings are formed and released in everyday consciousness.

Outline of Theories: What's Next?

Further concepts: In addition to the core concepts just outlined, the model goes on to propose that cyclic patterns of *impulsing* in the four areas of the conscious pathways achieves resolutions in

steps. This can be called an *Activity*. So when a resolution doesn't occur directly, a thought of a projected resolution is derived, which defines a resolution that has occurred in the past for a similar situation. The gathered energy of the thought's reflective tension spring-loads and drives the activity, through a temporal record that defines a resolution that was achieved and recorded, step-by-step in a cyclic pattern, in the past. As the backed-up energy drives this cyclic pattern, it unfolds, as if on autopilot--from the stress to the release state, forming the resolution. When the resolution is achieved, its energy often feeding into driving the next activity (referenced to another temporal record.)

Beginning early in life, we begin developing a personal pattern of activities, to meet routine patterns of needs, as well as intermittent needs. This becomes our lifestyle.

This theory may help us see what it takes in everyday life, to get the resolutions we need to avoid intense reflective tension patterns, as well as the intermittent and routine resolutions we need to return to balance throughout our lifetime. So at best, we each may develop a personal balanced lifestyle that stays in sync with how this System functions well--as it complements healthy functioning in the body's other systems--and supports that same in others.

Further Information

References: Website: www.impulsing.org

Ingebo-Barth, DM The Conscious Stream: Review Edition, Self-published 2000. Most of the model's concepts are covered in this edition, but organization and terminology has been developed. Copy free from impulsing.org

Updates: A copy of this poster will be available without charge at impulsing.org beginning in October 2014. Future updates will be freely available at impulsing.org

Distribution: This material may be freely copied—when any related material is also freely given—without charge, and when reference is made to the material's source and context. To ensure free access to anyone interested in this model, no agreements have been, or will be made, that limit the distribution of my work on the impulsing theory.

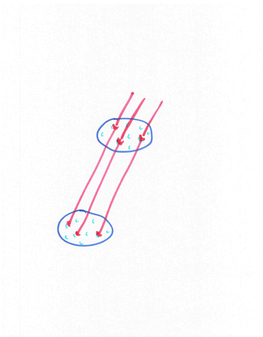
In the works: At lay level: 1) Booklet outlining model (replacing The Conscious Stream.) 2) Updated website: concept outline, relation to physical data, terms of contact and response 3) Recordings on Impulsing topics: introductory and advanced 4) Revised poster / brochure: Introduction, with overview of Impulsing Model

Support: If you'd like to support further work, contributions up to $20 are appreciated, especially when a like amount or more, is also contributed to support basic resources to your local and extended communities.

Impulsing POB 220 The Dalles, OR 97058. •
08/30/14 •

Our Notes:

Larger illustrations: 1-28



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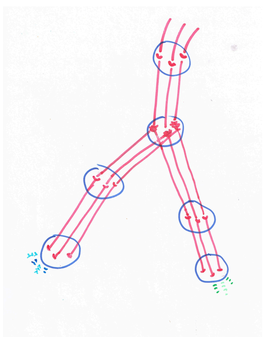

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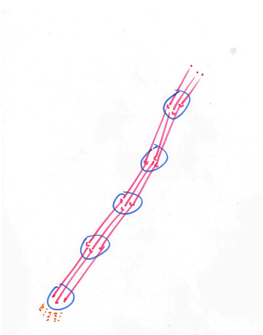

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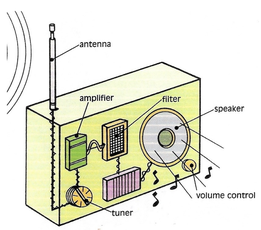

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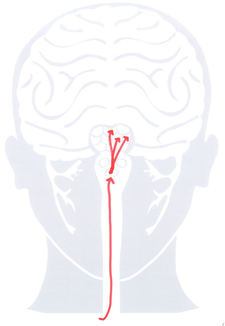

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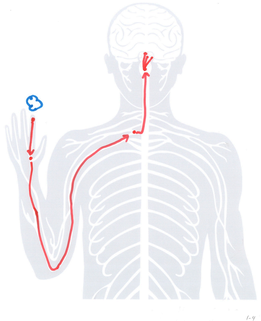

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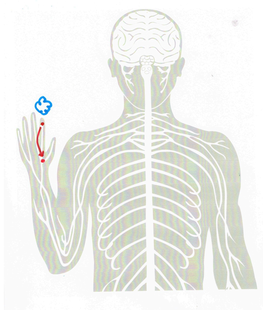

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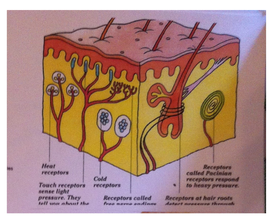

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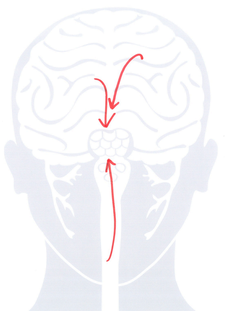

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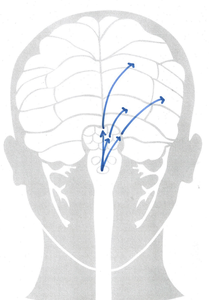

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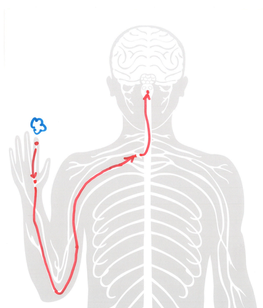

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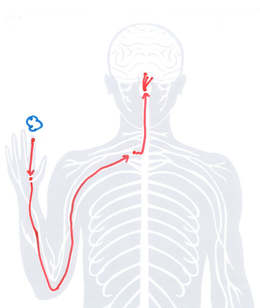

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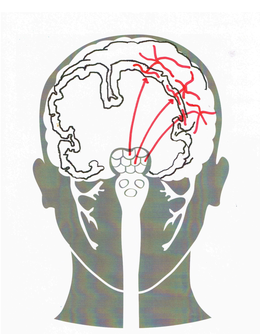

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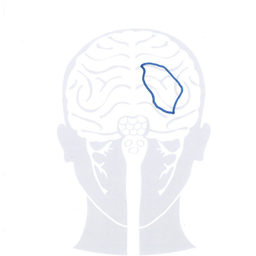

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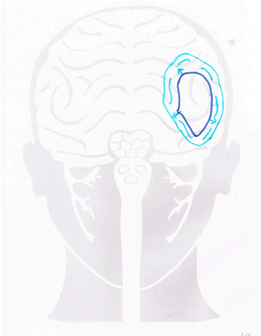

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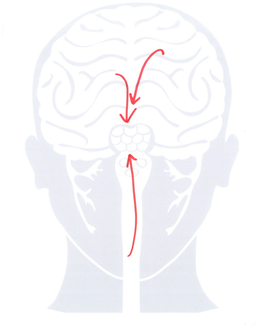

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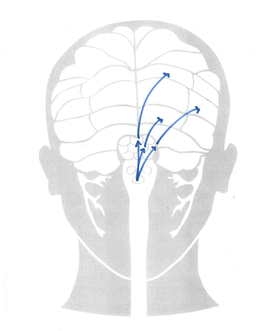

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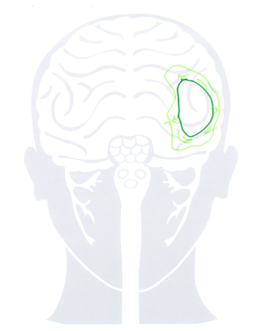

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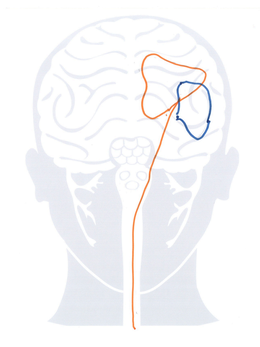

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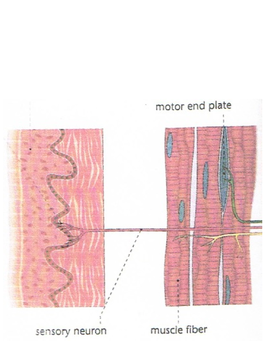

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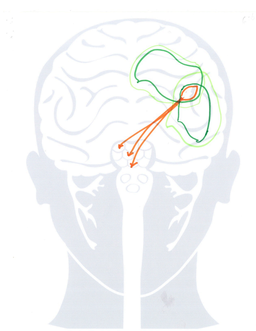

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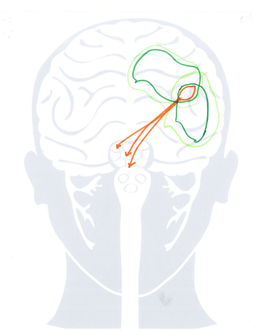

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