

AN OUTLINE OF THE MECHANISM OF MEDITATION

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INTRODUCTION

The physical bodily mechanics of meditation, like any ordered physical system, can be understood as one of interacting nodes and lines of force acting through them. Appropriate relaxation allows the perception of such a mechanism and permits relatively easy ways to voluntarily manipulate it.

The **significance** of such capability is that while traditional meditation instructs in terms of mental actions that are difficult to define and perform, the material outlined here enables control through purely physical means.

The direct connection between bodily and mental events need not be argued, it is already assumed in postural and other actions in traditional mediation. However, the present methods provide an explanation for this relationship as well.

Four elements are important in such operations:

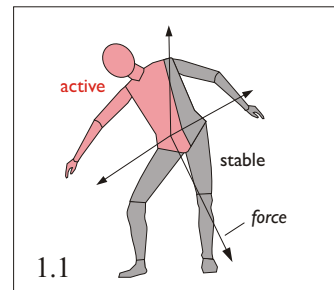
(1) location of the control elements of bodily forces as nodes and lines of force; (2) antagonist interplay of forces; (3) sectional divisibility of the body; and (4) appropriate projection of body-mind space by control of tensions of the muscles of the eyes, body and respiration, behaviors which otherwise automatically occur in everyday life.

1. BASIC MECHANICS

1.1 The perception of the body

Perception of the configuration (or mapping) of **muscular tension(s)** of the body and of the sense organ musculature is the only tool we have for sensing and controlling the body-mind musculature. The term *mapping* refers to the distribution and the energy levels of forces.

The perceived tension map of the body is normally gross, consisting of large regions of active and mutually opposing (antagonist) regions. *fig. 1.1*. Such low-resolution map of body image can be refined if we relax to an appropriate degree, i.e., maintain a tonic, or neutral state of the body or particular regions.



1.2 Nodes, lines and projections

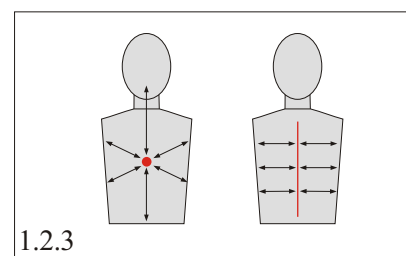
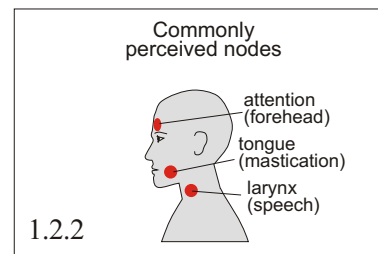
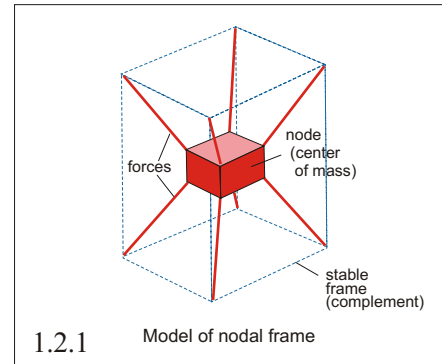
Physical objects subjected to tensions can be analyzed (as in physics and engineering) as frameworks of linear forces. Lines of force can be concentrated, or summed into **nodes** of intersection, or **centers of mass**. Such nodes of concurrent forces contain information about the forces meeting and acting through them, *fig. 1.2.1*.

Through sufficient relaxation we can directly **sense** the forces acting within the body (which principally keep us erect and maintain respiration) as clearly perceptible **lines** and **nodes** of tension. Commonly experienced are larger tension nodes on the forehead between the eyebrows during attentive observation or thinking, or in the tongue during mastication, or in the larynx and the tongue when speaking, *fig. 1.2.2*. Breathing and posture are crucial factors in adjusting the nodal framework of the body-mind.

Manipulating respiration and body posture in meditation is simply the adjustment of the nodal framework to minimize and control mental activity.

Nadis (channels), *chakras*, *tanden*, etc. are generated through internal visual and muscular **projection** of configurations of nodal structure, *fig. 1.2.3*. (See 2.4 *Projection*) It is probably the geometrical organization of our musculoskeletal body and actions that generates our mental concepts of geometry in the external world.

In ordinary actions there are many possible patterns of body tension with their appropriate of nodes and force lines, but meditation employs those that produce stability and tranquillity.



Internal projection commonly occurs in thinking, and in recalling memories, etc. The eyes are the chief generators of three-dimensional space in both outer and inner mental space. External objects with which we have no tactile contact are internally processed, yet they are perceived outside the body. (See 2.4 *Projection*)

Nodes may be located in a solid object, or in the space inside hollow objects or between objects: cf. in a cylindrical tube, or between binary stars or other celestial bodies.

External projection of lines and nodes of force is not unknown. Hitting the target in Zen archery, or in American Western sharpshooting, without linearly sighting the target, or in fact in any ballistic sport employ extra-body projection of points and lines, that are actually present only within the mental space.

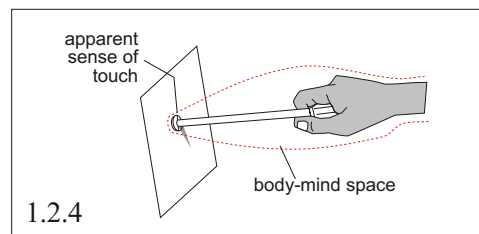
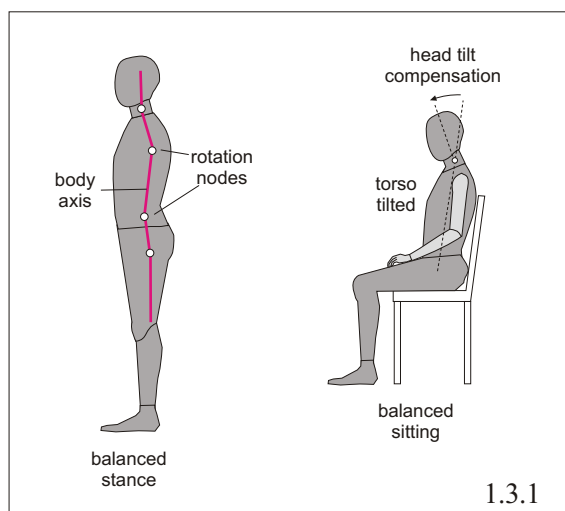
Experimental study of extracorporeal projection in perception was conducted, though not explained, by G. von Bekeky who showed that subjects can sense vibration applied to their body as being **outside** the body, (cited in Karl H. Pribram *"Brain and Being: At the Boundary between Science, Philosophy, Language and Art"* John Benhamins, 2004). He related his experiments to the everyday experience of feeling a screwdriver tip contacting the screw head or feeling an object (like blind people) just by touching it with a stick, *fig. 1.2.4*.

Treated as a framework of **nodes, lines** and **projections** the body-mind can be mapped and described as a complex meditative engine.

1.3 Body position—Nodal tilt adjustments

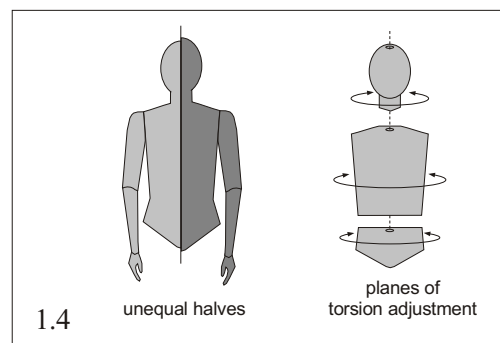
Contemplation requires a balanced body set in equipoise. The body, organized in all its actions and postures as a **framework** of **nodes** and **forces**, is hardly ever in a balanced state except in consciously adopted positions of equipoise. However, it is possible to generate or maintain a contemplative state in any body position as long as the **nodal** configuration is appropriately **adjusted**. This fact is important in meditation for persons with **physical impairments**.

For example, if one sits with back leaning against a support, then an adjustment for balance can be made by a small forward tilting of the head, *fig. 1.3.1*. Instruction in Rinzai Zen for raising the back of the neck is an application of nodal tilt adjustment for an otherwise vertical torso.



1.4 Left right asymmetry of the body

Basic instruction to keep an axially centered and erect torso in meditational sitting is somewhat misdirective, for the body is **not symmetrical** and if held rigidly straight and centered, the slight inherent imbalance prevents quieting the mind. Because the left and right halves of the body are of unequal size, when the body is truly relaxed, they naturally rotate, twist in relation to each other. The head, torso, pelvis must be allowed a very small transverse rotation to find their resting positions, *fig. 1.4*. The head and eyes, for instance, slightly turn to one side. After sufficient length of quiet sitting such adjustments come about spontaneously, but it is useful to observe them when starting the meditation. Such adjustment for body asymmetry underlies the Zen hand positioning with left on top of the right one.



1.5. Relaxation

Relaxation is the state and positioning of the body that is generated at **minimal** levels of muscular energy. Ability to relax to an approximately tonic tension state of the body is important in meditation.

The significant point is to **balance** the body and maintain a free, unburdened **respiratory** tract. Unequal forces **distort** the respiratory framework and ensuing corrective measures only add to levels of tension.

1.6 Breathing

Special attention must be given to relax **specific regions** of the body. These include the thorax, which is the upper part of the engine of breathing, the hyolaryngeal complex, which is the controlling valve of respiratory volume flow, the tongue, velum, pharynx and jaw, which are monadically integrated with the larynx and the eyes, etc., *fig. 1.5*. The region to which all these parts belong is the **visceral body**, which stands in contrast to the somatic body, and this distinction is fundamental to meditation. The biological basis for such division was described by A. S. Romer (*The Vertebrate as a Dual Organism: The Somato-Visceral Animal*, Evolutionary Biology: Vol. 6, pp. 121-156, 1972), but it is not discussed here.

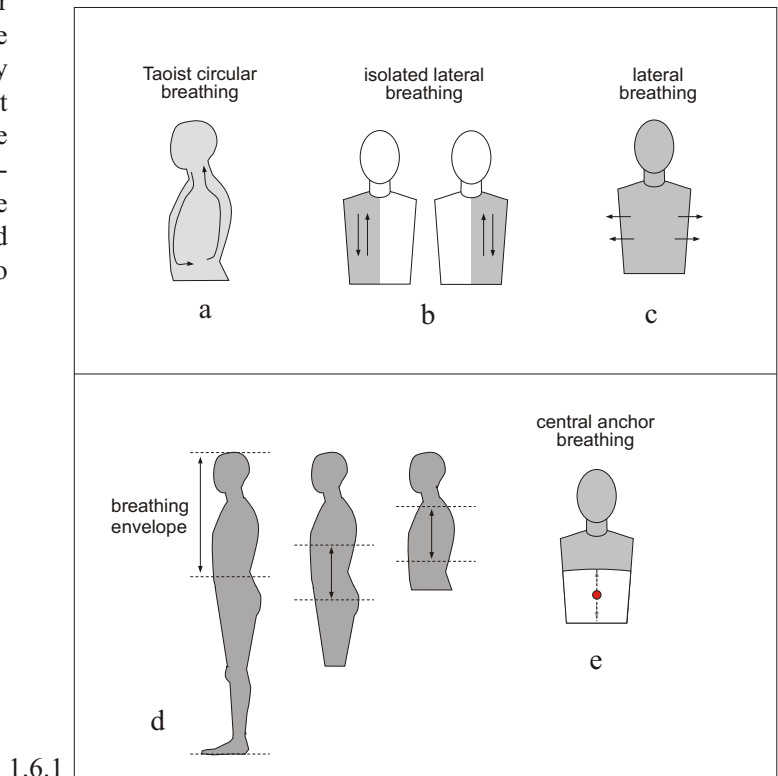
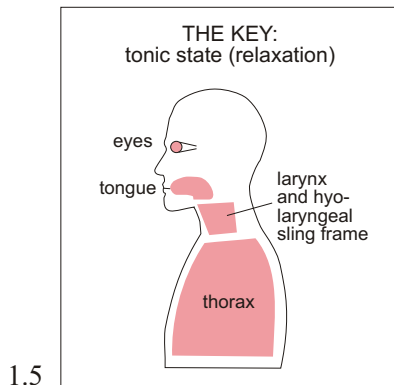
Although minimalizing body tension is the most convenient way to mediation, full relaxation is not necessarily followed in every method. In Rinzai Zen energetic tanden and breathing pressure occurs, and distorted body positions are features of the *Londe* series of Dzogchen, where the body is appropriately **adjusted** to balance the distortions. (**Methods** of relaxation is an extensive topic and cannot be covered here.)

The behavior of the **eyes**, chief generators of the sense of **spatial** location must be especially controlled. The eyes have evolved as devices for constant visual scanning of the outer world and are inherently in constant saccadic motion. It is only after sufficient duration of contemplative sitting that the eye musculature finally relaxes, at which time mental activity becomes minimal. However, in non-sitting meditation, or in early phases of sitting, care must be paid to eye motion that has not yet quieted down. (Details on eye physiology as related to meditation is not covered here.)

The traditional instructions in meditation: to sit in the **lotus** or similar positions and to **count breaths** can present difficulties (for Westerners). The physical problem with the posture, added to the involvement of attention on breathing and on counting, activates thinking and even speech and so distracts from the aims of the practice.

There are several convenient and effective ways for breathing to **quiet** the mind in any **posture**. (For examples see *fig. 1.6.1*.)

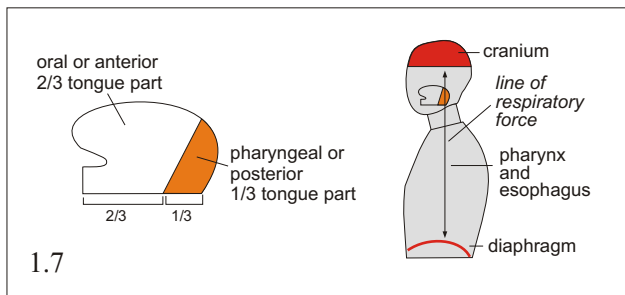
- (a) The Taoist circular breathing path,
- (b) breathing on one side of the thorax with periodic alternation between the sides, but without need to activate the arms in blocking the nostrils with finger, as practiced in Hatha yoga,
- (c) lateral breathing, where the thorax is expanded and contracted sideways,
- (d) breathing within only one vertical division of the respiratory column. Such limiting of breathing to within a certain vertical envelope is employed in Tibetan vase breathing,
- e) breathing anchored on the central node of a vertical section,



1.7 Respiration and tongue sections

The tongue is anatomically and developmentally comprised of **two** regions, the oral (or anterior 2/3) part and the pharyngeal (or posterior 1/3 part). The oral part is active principally in mastication, articulation and oral respiration. The posterior part is active in nasal respiration; it stabilizes the oral as well as the entire respiratory column with respect to the vertical pulmonary forces, *fig. 1.7*.

Stable meditational respiration is nasal and vertical (before it turns into the nasal tract) and its anchoring is served by the node of the posterior 1/3 part of the tongue, rather than the that of the anterior 2/3 part. **Relaxation** of the anterior tongue part yields antagonist primacy to the posterior part, and is a process which easily **quiets** the mind.

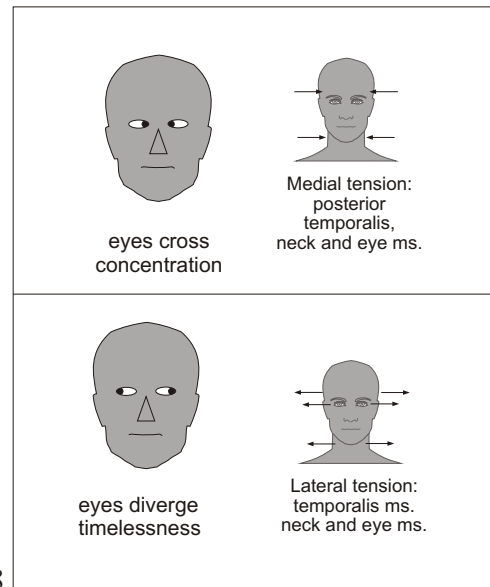


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1.8 Lateral bias setting of the eyes

Allowing the open or closed eyes to settle into a position that is slightly **medially** biased (adducted) or **laterally** biased (abducted) produces specific meditational states. Subtle adduction, or crossing of eyes, is part of **concentration** while abduction (walled-eyed setting) generates the perception of **timelessness**, *fig. 1.8*.

Both of these practices involve other musculatures, which unless involuntarily impeded, will also come into the appropriate corresponding state. For instance, **lateral** eye rotations are simultaneously accompanied by eyelid bias for closure and by spontaneous tensions of muscles in the temporal area (temporalis and the upper parts of other jaw muscles). Lateral biasing of eye position is also inherent in lateral breathing. **Medial** eye bias is accompanied by opening of eyelids and tensions in the lower regions of the jaw muscles. (Details on control of the external eye muscles are not covered here.)



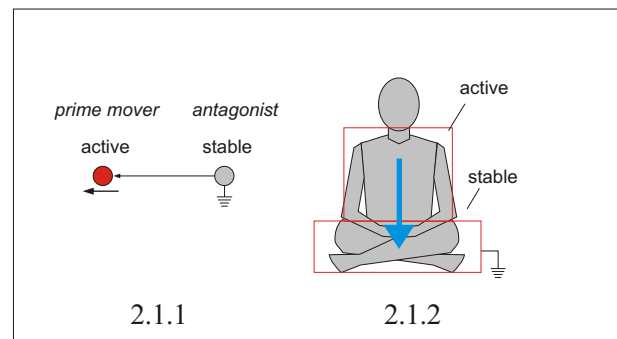
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2. MECHANICS OF NODAL COACTIVITY

2.1 Antagonist primary vs. secondary relation

The manifestation of forces always consist of **two** (or more) elements, (a) active or potential movement and (b) stable ground to which movement is referred. That is, a force must have a stable point against which it acts, so that there are really two antagonistic forces present, one active and one passive. In physiology such opposing forces are called **prime movers** (or primary agents) and (secondary) **antagonists**, *fig. 2.1.1*.

As mentioned above, the **tongue** is composed of two sections, the anterior 2/3 (or oral) and posterior 1/2 (or pharyngeal) parts. (See also 1.7). Controlling the antagonist relations of these divisions aids in meditation. Full relaxation of the front part yields primacy to the posterior part which in turn assigns primacy to abdominal respiration, freeing the upper body and head of tension, and creates tranquility and **concen-**



2.1.1

2.1.2

traction. When the pharyngeal tongue fully relaxes, and the anterior becomes primary, tranquillity is gained but with a perception of **timelessness**. As always, the eyes and respiratory muscles must be allowed to automatically find their appropriate resting states.

2.2 A note on the lotus position

This relationship is important in meditative action. The classical **lotus** position consist of an upper active (respiratory) and lower stabilizing (leg-locking) part, *fig. 1.2.2*. Crossing legs when sitting in chairs is common practice in the West and its purpose it to increase body stability and therefore, tranquillity.

The **lotus** posture further adjusts the body and mind in two ways: bringing the legs and feet close to the body keeps the vertical axis within the body, and lateral pressure in spreading of the legs quiets the mind as the muscle of the eyes and respiration receive lateral bias.

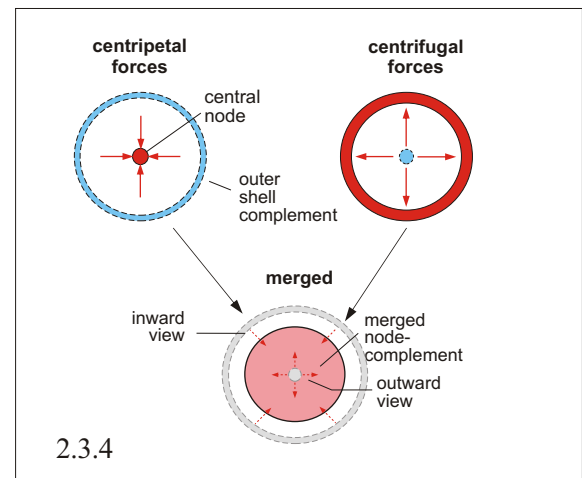
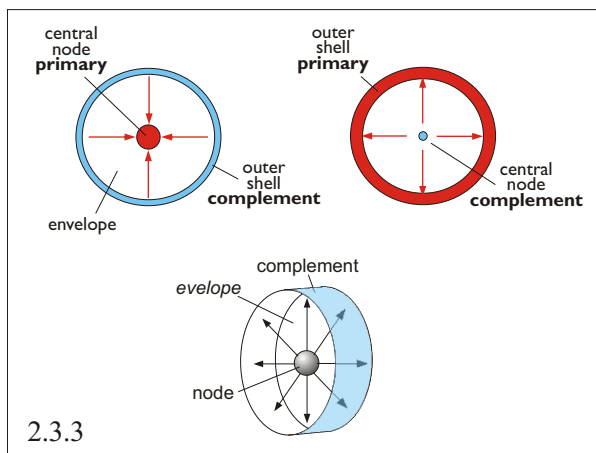
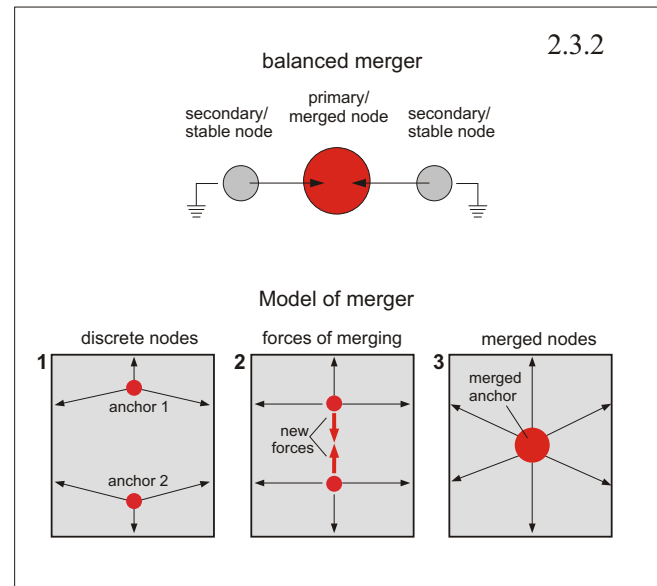
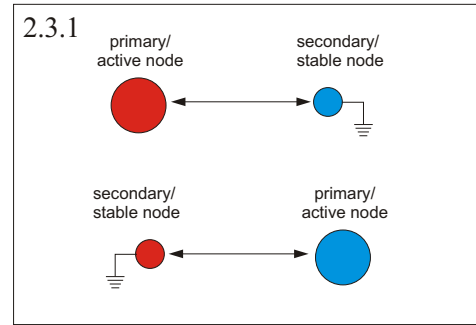
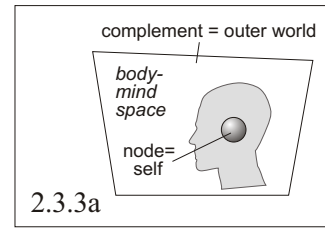
2.3 Mergers

Prime agency (or primacy or dominance) and secondary rank can be **exchanged** between two antagonists, *fig. 2.3.1*. The two opposing forces can also coalesce into a single **merged** unit when the two forces are equal. This balanced merger allows forces to be in a state of equipoise, *fig. 2.3.2*.

In terms of nodal frameworks if one **node** is primary its antagonist can be either another node or a manifold/region, or **complement** surrounding it, *fig. 2.3.3*.

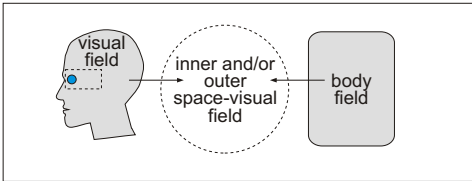
Conversely, the **complement**, in turn, can act as **primary** in relation to its antagonist node. The self vs. the outer world are perceived according to such antagonist variations in the body-mind framework, *fig. 2.3.3a*.

The merger of forces directed outward from the central node and the inward directed ones from the surrounding complement is the configuration described in **Douglas Harding's** book *On Having No Head*, where the inside and outside merge into a (non-dual) singularity, *fig. 2.3.4*.



2.4 Projection

Bodily and mental experience appears in a **space-like** field. The shape and location of this space is a function of **projection** of the nodal framework of the body and sense organs.



2.4.1

Projection is produced by the coaction of spatial positioning by the musculature of the **visual** system and the **body tension** map. Hearing is also a component of the body-mind space, and can serve as a tool in meditation, but it need not be considered here.

Sensation of tension of a body region is identical with the **consciousness** of it and when this perception is combined with visual spatial placement, the object of attention is placed in space, *fig. 2.4.1*. The generation of channels/nadis, i.e., tension regions and lines in the body map are achieved through projection inside the body. When these lines are **relaxed** and **vacuous**, i.e. feel extraordinarily light and unencumbered, then their tension has been **transferred** to their antagonist **complement**, *see 2.7a*. When in meditation the visual muscles are fully relaxed, the visual space becomes vacuous and appears as a field of empty space of great clarity.

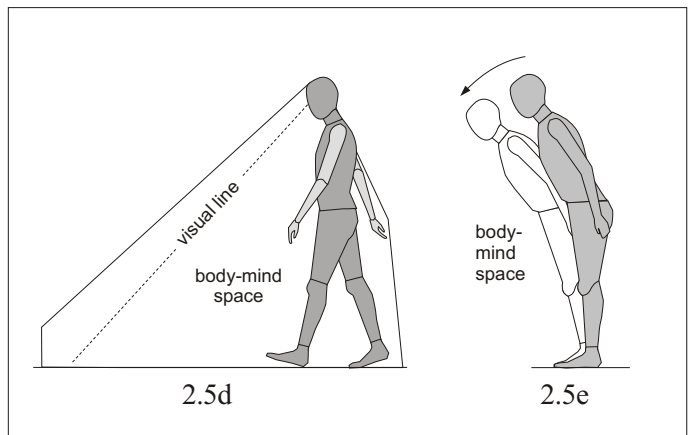
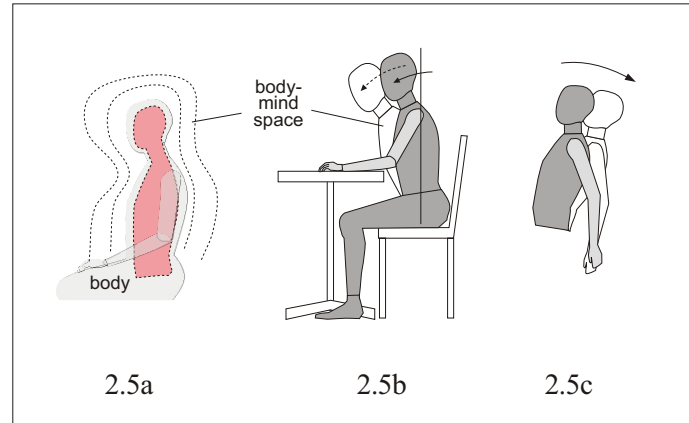
2.5 Projection due to tilt

When sitting straight with legs locked close to the body (lotus position), and with eyes closed and relaxed, this contemplative space is centered within or around the body, *fig. 2.5a*. When the body is not so balanced, but is tilted or is in motion or in various sitting positions that space is no longer congruent with the body axis, but is partly or entirely projected **outside** the body. The exact location of this space depends on where the eyes are focused, and also on whether they are closed or open.

This is a major reasons why after arising from sitting the meditative state can be **lost**. But that state is **regained** if one locates the mental space of the contemplative state in its new projected location outside the body.

The body-mind space rotates forward when one leans forward while sitting. The **angle** of projective rotation is proportional to the **degree of tilt**, *fig. 2.5b*. If a body tilts backward the projection also rotates in that direction, *fig. 2.5c*.

Figs. 2.5 d and e show projection in walking and in a tilted body. In Zen meditative slow walking, with eyes fixed on the ground about 8 ft in front the involvement of visual focusing expands the body-meditative space to reach the ground.



2.6 Traditional methods of controlling projection

1. In Hatha yoga the vertical body axis is built up from a point in the pelvic diaphragm.
2. Focusing the eyes between the eyebrows projects a node, although its exact location is not clearly defined in the such instructions.
3. Focusing vision on a mandala or on the ground ahead, as in Zen slow walk, employs nodal projection outside the body.
4. Focusing on the tanden is an intra-body projection at variously defined locations within the abdomen.

2.6a The behavior of the eyes in inner visualization

Inner visualization is projection of attention to the **inner body core** (see 3. *Trimerism*), which, in terms of musculature is the **upper visceral body** or tract and its three transverse sections. The **upper** section includes the tongue, larynx, pharyngeal muscles, the **middle** one is the esophagus and the **lower** portion is the diaphragm, see *fig. 2.6d*. (See *Visceral body* in *Appendix*).

2.6b Projection of the inner core

1. First **relax** one, two or all three transverse sections of the visceral body.

2. Next apply a **backward** pull on the **chosen** section. **All** parts, the eyes, the tongue, larynx and pharyngeal regions must be also allowed to move **together**. Holding one of these tensed obstructs the movement of the rest. (See 3.2 *Monadism*).

3. Move the **eyes** gently backward. It is important that the eyes be allowed to rotate as shown in *figs. 2.6 a* and *b*, so as to tilt toward the chosen vertical division of visceral body. However, the upper and lower (**rectus**) eye muscles must be **independently** treated. In rotating upwards the **inferior** rectus is active while the **superior** rectus should remain relaxed and inactive. For the **middle** section the eyes are not tilted; backward moving tension is **shared** by both the upper and lower muscles. **Downward** eye rotation uses only the **superior** rectus muscles.

3a. It is important to note that the axes of the orbits (or eye sockets) meet at a 45° angle, and therefore relaxing the eyes should allow them to naturally point medially backwards and hence the frontal eyes to slightly turn outwards. This rotation **automatically** takes place when both a) the superior and inferior and right and left lateral rectus muscles, and b) the superior and inferior oblique eye muscles enter a neutral (tonic or relaxed) state, in which event distracting inner visual imagery is eliminated, *fig. 2.6 b*.

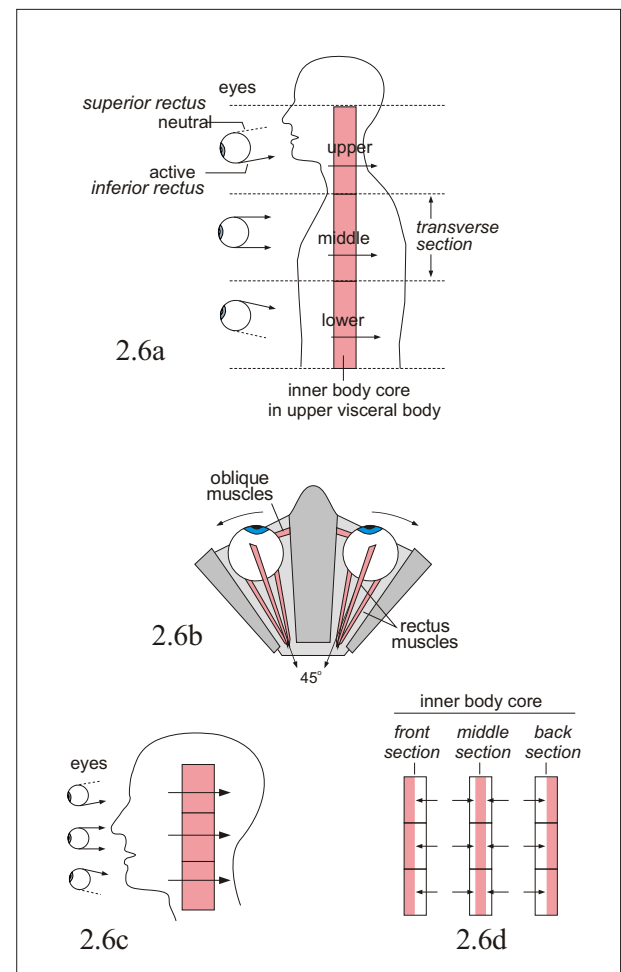
4. As backward pulling of tension proceeds, with eyes neutral, the **inner space spontaneously** arises and its framework locks into a semi-stable state as long as the framework remains unchanged. This visualization results not so much in **seeing** but in **feeling** to be within an inner space. Actual “inner seeing” of objects is matter of creating a mental picture, within the inner space which has now been set in place.

5. The actions can be **initiated** by eye movement and rotation as well, or else it can be coupled with simultaneous upper visceral muscular retraction. However, it is **easier** to start with upper visceral muscular action.

6. It is **best** to perform this action with eyes **closed**, but with sufficient practice the eyes can remain open.

7. Actually transverse division of the body can each be projected onto **any** body region, so that the head, the tongue, the neck, the thorax, or the abdomen can be treated as a three leveled region. (See 3. *Trimerism*). In this case the eyes are rotated the same way. *Fig. 2.6c* shows the eye rotations in a three level projected division of the head.

8. Furthermore, the inner visceral body core can itself be projected as divided in three **axial** (longitudinal) sections, *fig. 2.6d*. These can be utilized in ways described under 3. *Trimerism*.

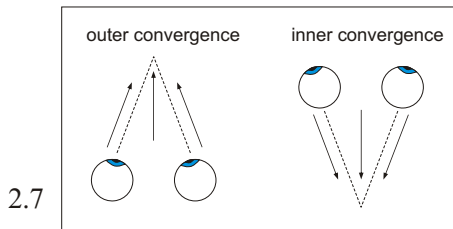


2.7 Visualization

Visualization, as differing from ordinary “seeing” of external objects in the mental field, refers to perception of objects or events in the **inner** mental field.

Visualization occurs when the eyes, whether open or closed, do not converge to focus anteriorly but are rotated as if looking behind, *fig. 2.7*.

The eyes, prime data receptors to the outer world, are active **not** only in seeing external objects, but are also active during the perception of the inner body-mind. **Action** of the eyes refers to the rotation, convergence and focusing of the eye muscles. E.g., in **thinking** the eyes rotate and converge to focus in the “thinking space” which is projected as a region inside the head. Hence the control of the external (rectus and oblique) eye muscles is an important tool in meditation.



2.8 The three sub-functions of projection

Tension of the visual, audio and bodily muscular frameworks are the three functions that create the experience of spatial dimensions. The space in vision and hearing needs no explanation. Bodily spatiality is no more than the perception of a region of muscular tension, which combined with visual space projection informs us of the position in space of bodily sensation, e.g., feeling a finger, a region of the skin or a segment of the intestines, etc. Of course, since all body parts are monadically united all three sub-functions operate simultaneously.

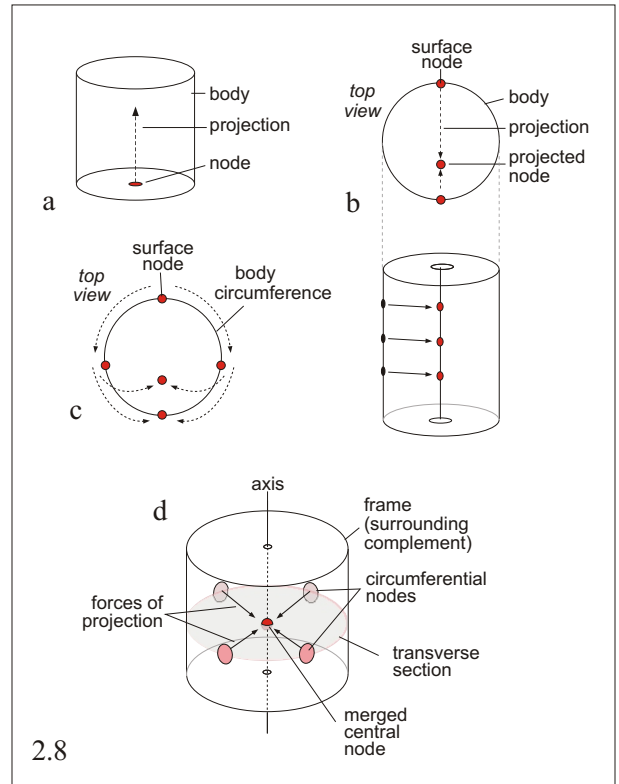
There are at least four methods for muscular projection, *fig. 2.8*:

a. Vertical (longitudinal) projection from a node, as in Hatha yoga, where the starting point is in the pelvic diaphragm, at the base of spine, etc.

b. Linear transverse projection starts with a tense node or point on the surface of the body and moves it inward towards the center. If a series of points in a line are first generated then moving this line inward produces a projected line.

c. Circumferential transverse projection starts with one (or several) node(s) on the body surface and moves it (them) around on the body surface in left and right directions. From such surface nodes inward turned movement can generate nodes within the body.

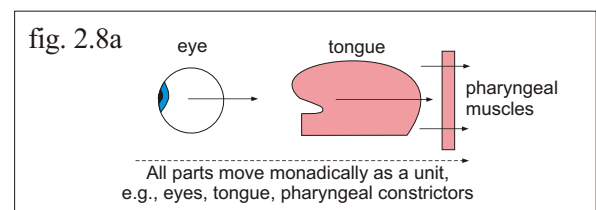
d. Circumferentially located nodes are the starting points in the **linear transverse merger** method of projection. Here surface nodes lying directly opposite to each other are moved inward to meet in an internal merged node, see *2.9.2b*.



2.8a Note: relaxation and monadic unity of parts

1. Relaxation of all parts **other** than the active one allows them to settle into the appropriate configuration: all parts of the framework of a desired action must move together, or else **disharmony** in movement obstructs a unified framework action, *fig. 2.8a*.

It is easiest to operate one agent and let the other relaxed parts fall in place. Hence either bodily or eye action can initiate projection, although the bodily one may be easier in general.



2.9 Methods for nodal projection

Once the inner space body space (in the visceral body) has been projected, one can project nodes and lines in this space. The method in Hatha yoga where a *nadi* or axial line is built from the base of the spine may be the simplest method.

a. Nodes can also be located by placing attention on, i.e., simply tensing a small region or point in the body, preferably in the visceral body, and then balancing the forces running into it, so that the node and its framework can settle into a stable state, *fig. 2.9a*.

b. Another way to find nodes is to locate two (or more) **opposite** points on the circumference of a transverse section of the body, and then to merge them centrally, *fig. 2.9b*. **Merger** is accomplished by the centripetal (medial) pulling together of these points, while allowing the eye musculature to spontaneously adjust, see 2.3 *Mergers*). The eyes must be sufficiently relaxed so that they do not impede this medial pull, but rather, flow with it until they spontaneously reach the correct focal **backward** convergence, inside the head, just as in normal thinking.

As one moves along the line there are intermittent points of obstruction to movement. These are **nodes**, where other lines of force enter into the travel line. When only the two terminal nodes of a line are projected the movement along the *nadi* is unobstructed, *fig. 2.9d*.

c. A nadi can manifest either as a line of a moving tension spot or of a moving relaxed spot, i.e., a vacuole), *fig. 2.9c*.

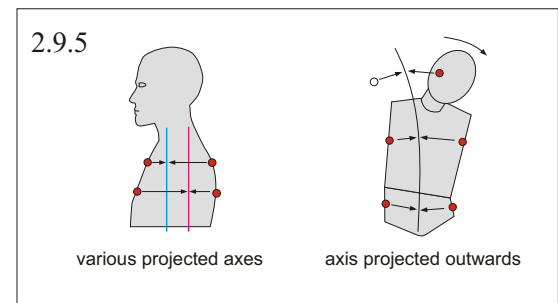
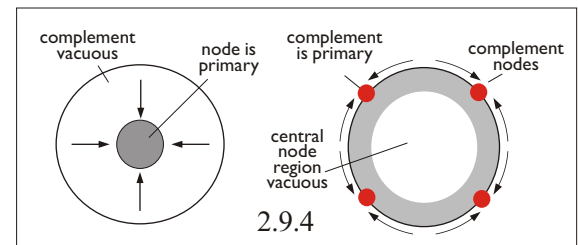
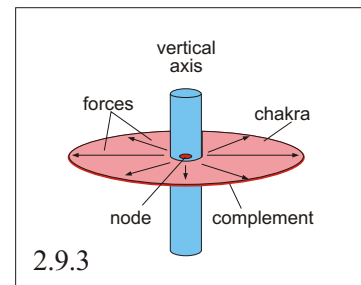
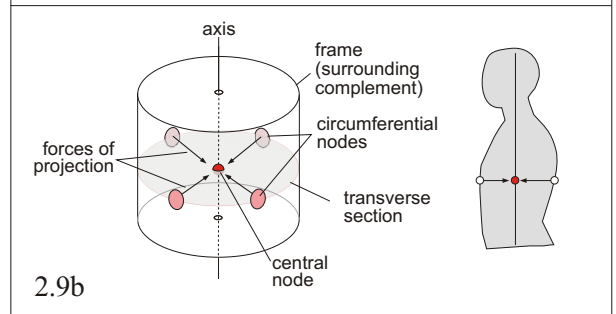
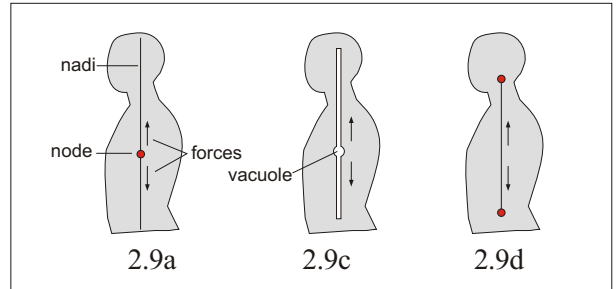
d. From nodes of tension centered on the axial line (*nadi*) the **outlines** of **chakras** can be projectively generated by outward (centrifugal) vision and tension expansion at appropriate heights in the body, *fig. 2.9.3*. The **plane area** of the **chakra** is generated by the merger of the central node and this circumscribed complement. See *Mergers*, 2.3. The physiology behind the rays and colors in chakras is not covered here.

2.9a Vacuoles, prana, ch'i and nadis

A central node can be maintained as **primary**, but its primacy can be **transferred** to its surrounding field or complement, whereupon the node itself becomes relaxed, thereby becoming a **vacuole** (as termed Vajrayana), *fig. 2.9.4*. In this case the forces of the complement pull not against the central node, but against **each other**: tightening the circumference as in barrel or arch construction. The presence or a linear path of vacuous, i.e., completely relaxed nodes or regions constitutes **prana** or **ch'i**.

There are several *nadis* projectable on a central axis. One of these is the *shushumna* of Pranayama yoga, and the various off-center projections generate the *nadis* surrounding it, such as *medha*, *ida*, *pingala*, *jivatman*, etc. Of course, in distorted positions these lines

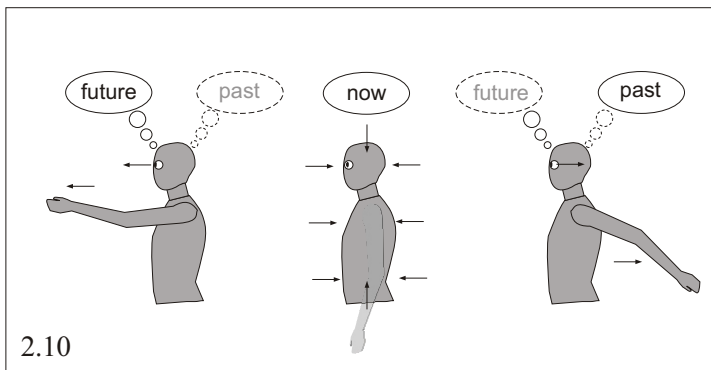
may twist and arise away from the central body axis or may be outside the body, *fig. 2.9.5*. The various Taoist, Tibetan Indian, and other schools each project a different central channel. The reason behind these differences is not covered here.



2.10 The location of mind-body space

The mind-body space is ordinarily located both inside and surrounding the head and body. During the thinking processes the space appears in the head for chair-using Westerners. (Peoples who sit on the ground consider thinking to be in stomach.) When we remember being in a place in the past the space appears somewhat behind: there is a subtle head-body posteriorly biased muscular tension. Thinking of the future brings on a forward bias. **Experimentation** shows evidence for this: if arms are held up forward, and/or the eyes forcefully stare forward, thinking of future action is possible, but thinking of past is significantly impeded. With arms rotated towards the back and eyes retracted the situation is reversed. The **now** is projected when the body-mind is centered and its forces are directed medially, *fig. 2.10*.

This clearly illustrates how we experience only relative locations, and that the mind can be anywhere. Cognition of **future** and **past time** as being forward and backward is a placement projected physically in those directions by the coaction of the visual and bodily muscular frameworks.



3. TRIMERISM

3.1 The three layers

Connecting to the inner body is the most fundamental requirement of meditation.

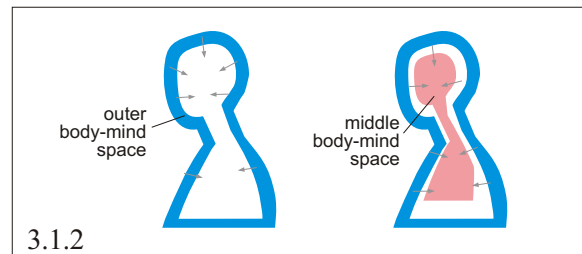
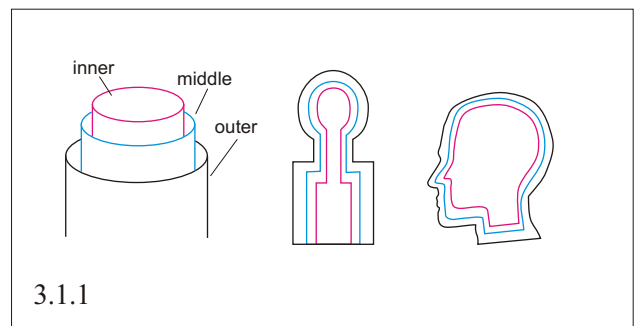
Early embryonic structure is fundamentally three-layered. This format is retained in many adult structures (*see Appendix: Triplicities in the body*) and so a pattern of triplicity, or **trimerism**, appearing in meditation is not surprising. Buddhist tradition also deals with several triples, e.g., the three bodies, the three *gunas*, etc.

The body-mind is composed of **three** shells or layers, *fig. 3.1.1*. If the body and most especially the visual and the respira-

tory musculatures are in a uniformly relaxed state, three distinct body layers can be perceived. One of the ways to perceive these is to generate a small but evenly distributed tension in the musculature under the skin in all around the body, enabling perception the **outer** shell. (One should essentially attempt to feel the skin, as this engages the musculature directly underneath the skin through the fascial attachments of the two tissues.) The inner region surrounded by the shell must be relaxed, *fig. 3.1.2*. Pulling the tension of this outer layer further outwards in one or all directions increases its apparent size to include space outside the body.

One can move to the adjacent **middle** layer by applying slight centripetal force uniformly to the perceived outer layer and gradually relaxing it. One can similarly move to the **central inner** shell. Again, all other parts of the body framework should be allowed their spontaneous adjustments.

The significance of recognizing these layers is that when mentally residing in any one of them, a particular mental state of perception is produced. The **outer** one generates perception of the **outside** world, the **middle** one generates perception of **attention**, and the **inner** core layer generates the feeling of the **self**, or "I", (*see paragraph 5.1*).



3.2 Monadism and trimerism

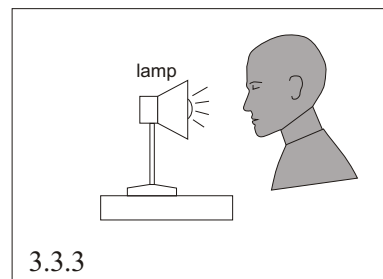
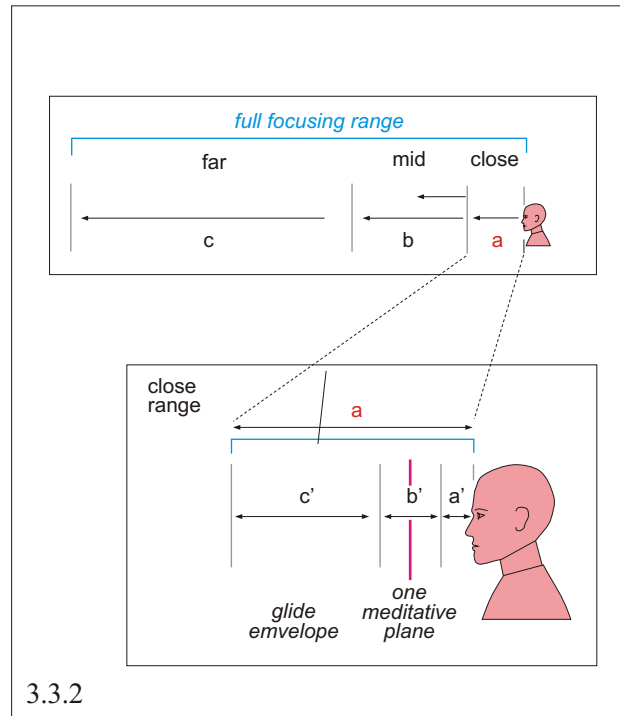
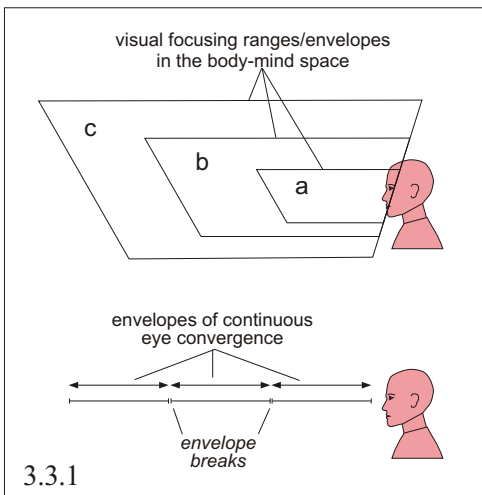
The body framework acts as a unit, as a monadic mechanical structure, that is, all its parts move together in strict coordination and no part can move independently. **Trimerism** is distributed in the **various** parts of the body and can be projected in different **planes** due to this **monadic** unity of the body: if a number of parts move coactively together as a unit, if one part undergoes a tripartite processing, then the other connected parts must also behave in a tripartite format, or else the actions go out of phase. Monadic mechanics are evident in many behaviors, e.g., in the way speakers of different languages, built from different phonetic mechanics gesticulate with arms and hands in different ways. The reason for monadism can be defined, but it is not covered here.

3.3 Eye focal ranges

Eye movement is monadically integrated with the entire body and so trimeric divisions also occur in eye behavior, *fig. 3.3.1*. The full range of focus between close-up and infinity falls into **three** distinct envelopes: close, mid and far ranges. That is, within one envelope or range the eyes can converge in one uninterrupted **glide**. However, moving to the next range requires a break in continuity, with a certain amount of added force—at least an eyeblink—needed in order to cross the envelope boundaries. Each of these ranges is again trimerally divisible, *fig. 3.3.2*. The meditative plane is where converged eyes are most relaxed.

Control of focal distances is important in meditation. Looking at an object so close that focusing on it is no longer possible quiets eye movement and the mind. Looking at extreme distances, like a flat horizon has similar effects. Cf. the serene mood imparted by gazing at the sea, or a cloudless sky or the star field of the heavens. Contemplation with either open or closed eyes and without any saccadic eye movement is possible only when eye convergence is allowed to rest within one focal envelope. (Saccadic eye movement, which is the source of proof reading errors, is related to this topic.)

The nearly hypnotic peace experienced by sunbathers, arising from the lack of eye focus target and the effect of uniform bright light, which retracts the eyes in their sockets, can be recreated in meditation by facing, with eyes closed, into a (60 watt) lamp at a close range (c. 15-25 inches), *fig. 3.3.3*. Staring at a wall too close for focusing has similar effects.



3.4 Mergers of layers

Antagonist coaction and merging by nodes and their complements between trimeric layers are possible. There are constant ongoing mergers in the nodal framework in everyday behavior. Merging of layers can be **consciously** performed by first simultaneously sensing two layers. When the forces in each are equalized, and relaxation is equally and simultaneously applied to both, the two layers spontaneously **merge** into a single, **combined** layer.

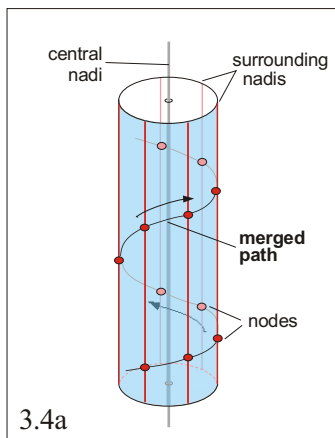
The merger of **outer** world perception with that of **attention** generates attention aimed at the **outer** world. Merger of **attention** with the **self** generates attention on the self.

Merging the layers of the outer world with that of the **self** produces the feeling of **identity** with the outer world. The merger of the attention and the self nodes with the nodes of particular senses appears to be the basis of practices outlined in the Surangama sutra.

3.4a The kundalini path

The spiral path of kundalini is a sequential movement through a series of nodes of either tension or vacuity. A circumferential set of axes can be projected around a central axis, e.g. as the *nadis* in Pranayama. Activating a node on one axis and then transferring the action to a node which lies on the adjacent axis, but somewhat higher (or lower) and then continuing this process produces a spiral path. *fig. 3.4a*.

Under correct relaxation and location of projection as well as appropriate synchronization with breathing, a node on the central axis can move in a straight line, but otherwise the spiral movement is easier. Moreover, it is more useful because it engages a larger portion of the



3.5 Mergers of body-mind space with actions

Body-mind **space** and mental or physical **actions** automatically undergo mergers in ordinary life, as in thinking or working. In meditation body-mind space and actions can be **consciously** merged in many ways. One method is to **first** allow projection of body-mind space to settle in a relaxed state, and **then** to project into this state the framework of an action, which may be breathing, eating, walking, etc., and **finally** equalizing the force level of the two elements, so that their spaces (or frameworks) **combine** in a merger. At this time the action and consciousness become a single (non-dual) experience. **Equalizing** the elements is easiest when respiration is optimally **relaxed**, i.e., freely flowing, with minimal obstruction and effort. In such mergers walking action, for instance, seems to be taking place not in the physical body and limbs space, but inside the body-mind space somewhat **forward**, and a certain distance above the ground, the specific dimensions (depending on visual focus, body posture and speed of movement.) Thus, one can **merge breathing** with any **action**.

3.6 Visualizing spaces and actions

Mental visualization is achieved when attention focuses on the **inner** core of the three body layers, thus when trying to visualize something, first the inner body layer is generated and then follows recall or generation of an image within the **inner** visual field of the body-mind. The entire action should be minimally energetic in execution, otherwise unnecessary forces will cause the ocular muscles to lose their setting for the inner core.

4. PRIMAL NODES

The most **fundamental** nodes in the mind-body framework are the **primal nodes**. These are originally primitive controllers of the cross section of the respiratory-feeding tract and govern the ancestral vertebrate's pharyngeal peristaltic wave motion that transports food. As parts of oral tract shaping these nodes later also became agents of voice production, which can most prominently be perceived in the actions of the **tongue**.

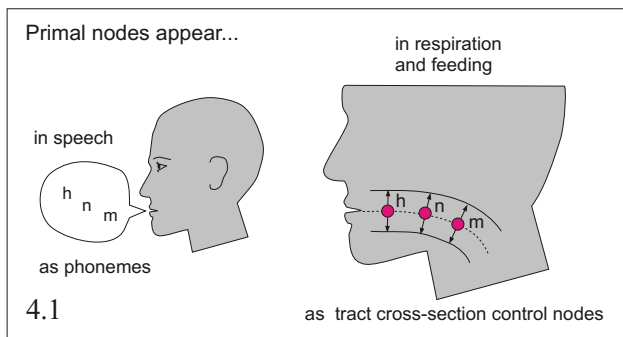
The tongue is a sense organ of great complexity. It has an unusual degree of sensitivity and is closely integrated with body-mind faculties, such as moods. The research of Paul Bach-y-Rita* has shown that the tongue can sense and read visual signals, coded as electrical impulses applied to the tongue surface, to assist in blindness or in other situations of

* P. Bach-y-Rita, K. Kaczmarek, M. Tyler, and J. Garcia-Lara. *Form perception with a 49-point electro tactile stimulus array on the tongue*, Journal of Rehabilitation Research Development, 35:427-430, 1998.

4.1 The primal nodes in the tongue

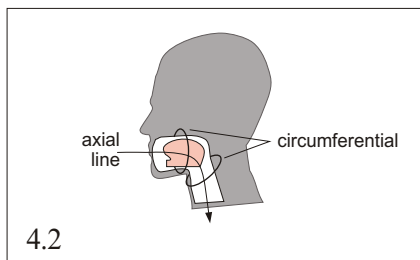
Three of the four primal nodes appear in the lingual articulation of the **three speech phonemes**, /h/, /n/, and /m/. These are not only elements of speech but being essential agents of respiratory tract control are important in meditation, *fig. 4.1*.

While all other vowels and consonants significantly obstruct respiratory flow, these three "phonemes" are always embedded in the three modes of **respiration**. /h/ is the sound of **open** mouth breathing, a silent /n/ belongs with **nasal** respiration with a lightly closed mouth, and a silent /m/ is always present in **nasal** respiration with mouth fully closed.



4.2 Mechanics of the respiratory-feeding tract

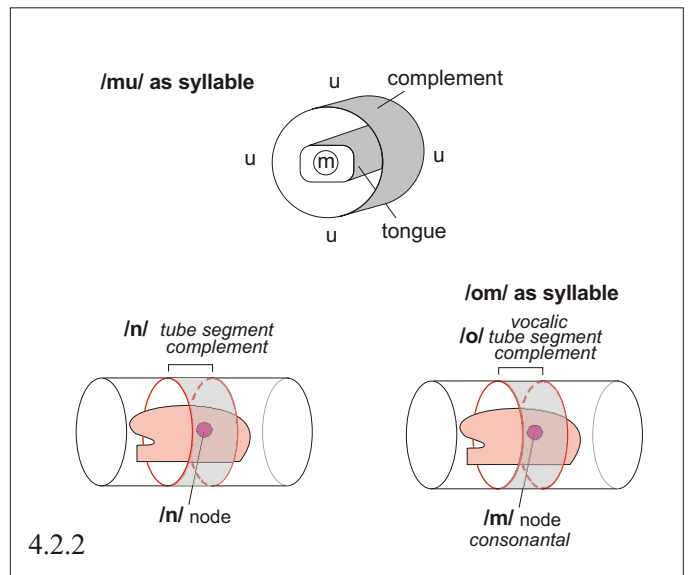
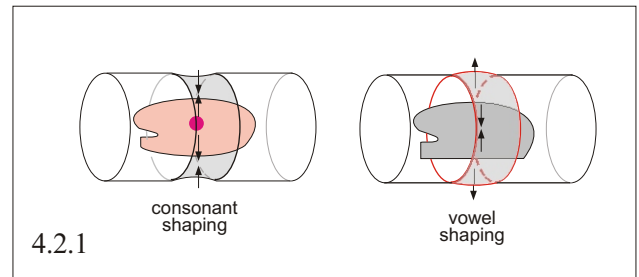
The respiratory-feeding channel is tubular and employs two different forces: axial and circumferential, acting, respectively, along the longitudinal axis and along the cylindrical tube wall surrounding it. The axis can be sensed as breath travels along the line running between the lips and the diaphragm. The tubular frame is perceived when we constrict or expand sections of the respiratory tract, e.g., lips, pharynx, glottis, etc., *fig. 4.2*.



4.2.1 The om, hum, mu, wu mantras

Essentially, vowels and consonants are, respectively, expansions and constrictions of the tract, *fig. 4.2.1*. Distinguishing these behaviors is useful in many ways, including contemplation of **mantras** such as *om*, *wu* or *mu*. The consonant in the syllable is projected, as a node on the longitudinal tract axis, while the vowel is formed by the shaping of the surrounding tract, *fig. 4.2.2*. Both the consonant and the vowel can be generated in **isolation** or in a **merged** combination as a special syllabic construction where the consonant and vowel elements do not follow in order but are **simultaneous**. This way the mantra appears not as a word, which can distract by involving language, but as a purely muscular phenomenon that allows abstract contemplation without speech or thinking.

When the components of *wu* or *mu* are merged the mental sound appears as some form of /ng/, as in English "long".



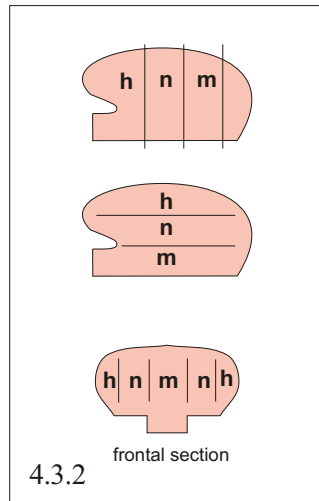
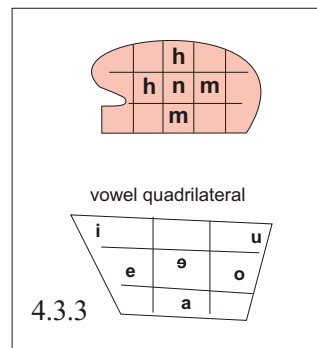
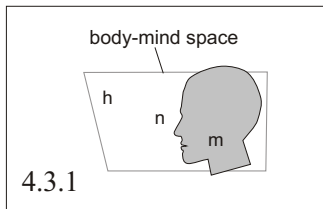
4.3 Primal nodes in meditation

The nodes /h/, /n/ and /m/ appear in the important **mantras** *hum*, *hung*, *namo*, *mane*, *om* and *mu*, etc. When integrated with respiration, these mantras, among other things, harmonize the mind by enabling free respiratory flow and consequently affect mental states.

These three nodes are integral parts of physiology because the tongue, and the entire upper visceral system to which it belongs, are essential in the bodily **grounding** of consciousness. Breathing and the tongue, as well as different parts of the monadic body (as they are employed in reflexology) act as one single unit. Shaping and placement of the tongue in various positions is part of physical yogic practices. Thus, the h/n/m configuration can also appear in other body-mind regions and partitions, depending on the kind of **projection** present. All projections of body-mind space include the primal nodes, *fig. 4.3.1*. (Details on how sounds are effective in meditation are not covered here). For instance, both transverse and coronal sections of the body or of the head, are associated with one of these nodes (see *figs. 5.1* and *5.2*).

The tongue can be **divided** along three planes. In the coronal, (para)sagittal and transverse planes h/n/m occupy, respectively, front/central/back or high/mid/low and left and right positions, *fig. 4.3.2*.

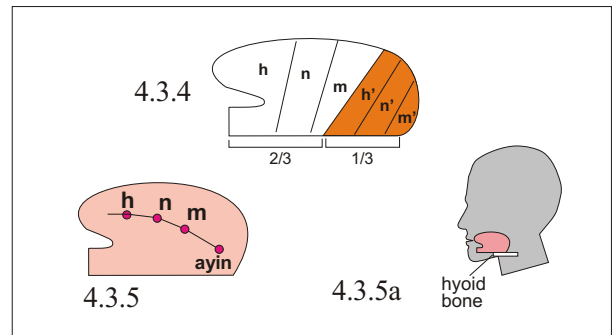
A composite of these two sets forms a **3x3 matrix**, a format very important in speech itself: this same 3x3 pattern appears as the **vowel quadrilateral** in the classification of vowels, *fig. 4.3.3*.



Both the anterior and posterior tongue parts, in turn, can be further divided into a trimeric h/n/m configuration, *fig. 4.3.4*.

Distribution on an **axial line** is another option, *fig. 4.3.5*, and can then include the node of the phoneme /ayin/, which is fundamental in **Jewish** meditation.

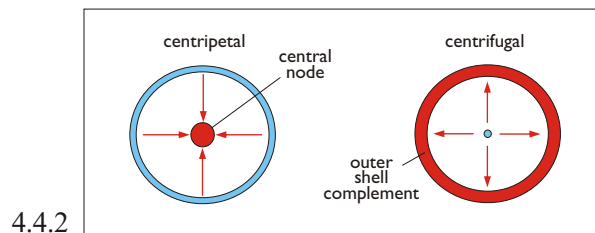
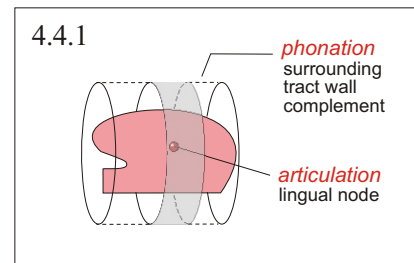
One way to generate /ayin/ is to fix attention on the front midpoint of the hyoid bone. This produces the /n/-/ayin/ antagonist pair, which is reducible to /ayin/ by relaxing the /n/, *fig. 4.3.5a*.



4.4 Some methods of node isolation

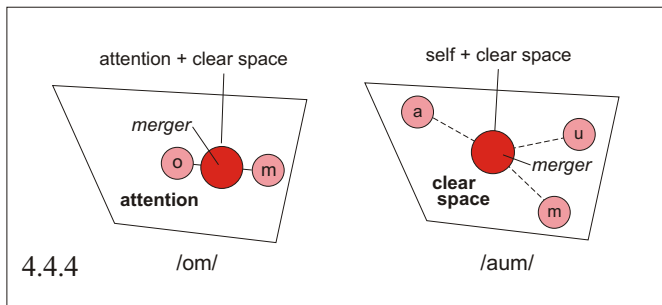
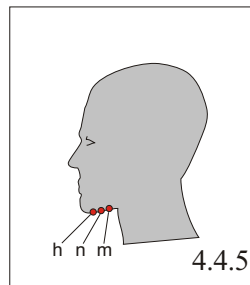
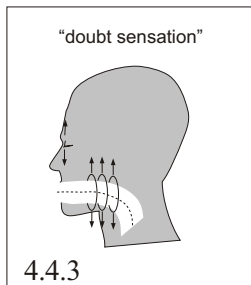
Simple pronunciation, even if only mental, of the h/n/m/ nodes as phonemes is ineffectual in meditation. Rather, their two basic functions, articulation and phonation should be distinguished.

The agent of **articulation** is the **axial node**, situated within the tongue, and can be activated without any complementary **phonation**. This node can be found by producing only the articulative force shaping the tongue. The **phonatory** forces active in the tract tube wall, when similarly isolated, without any force of lingual articulation, generate the tension within the tract wall and spatial envelope surrounding the lingual articulative node, *fig. 4.4.1*. (In the head or thorax, etc., such a transverse body slice corresponds to a *chakra*). The difference between articulation and phonation can be expressed as centripetal vs. centrifugal pressure, *fig. 4.4.2*.



Axial speech nodes within the tongue are the nodes that anchor external and internal lingual muscles to shape tongue **articulation**, and can be isolated from complementary **phonatory** tract shaping. The **complement** is a shaping function of the tract wall, which surrounds the articulatory node. The **"doubt sensation"** of the *hua-t'ou* exercise in Ch'an is an amplified generation of the surrounding vocal /u/ phonatory tubular tract shape of the lingual node of Chinese /w/ in *wu* and of Japanese /m/ in *mu*. The amplification of the articulatory node aids **concentration**. In ordinary actions such tract shapes appear when strong curiosity and doubt are combined. Forceful generation of such a feeling allows sensing the outward expansion of oro-pharyngeal space. *fig. 4.4.3*. In European languages this expansion is slightly more forward in the oral tract but it is still effective in projecting of inner body-mind space. This muscle configuration in Rinzai Zen may be projected into the tanden.

A note on om vs. aum: the spelling "a-u-m", commonly pronounced /om/ reflects the original pronunciation of the mantra, which is, in fact, more useful in mental control. Simultaneous production of the **isolated** phonemic nodes /o/ plus /m/ generates **attention** on body-mind space, while the same action with /a/, /u/ and /m/ generates the **unity** of self and this space, and is a state more stable than one associated with /om/, *fig. 4.4.4*.



4.5 Some methods for the perception of lingual primal nodes

Initial relaxation of the upper respiratory-feeding tract is necessary to perceive lingual primal nodes in the three methods described below.

1) Continuously **produce** a primal node as the phoneme /h/, /n/ or /m/, either vocalized or silently. Suddenly relax the

entire framework of production and note that the various lines forces decay not at the same time, but at different rates. The last ones remaining will be the primal node and its complement. Flattening the tongue on the oral floor or tilting the head forward assists in this action.

2) Produce one of the phonemes silently, but drawing air nasally and backward and then suddenly relax as above.

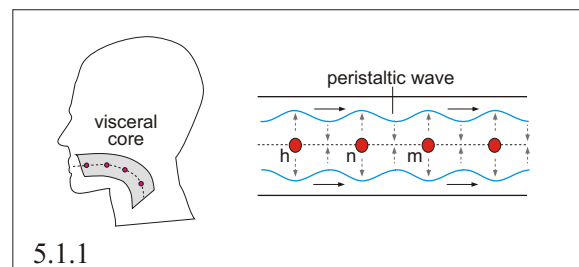
3) Start from a relaxed neutral state and with **gradually** increasing force **slowly** generate the phoneme. The first regions to become perceptible are the primal node and its complement. Once located, **either** the node and complement can be chosen to be primary or secondary.

4) The nodes are easily sensed when projected on the underside of the jaw, *fig. 4.4.5*.

5. THE VISCERAL CORE

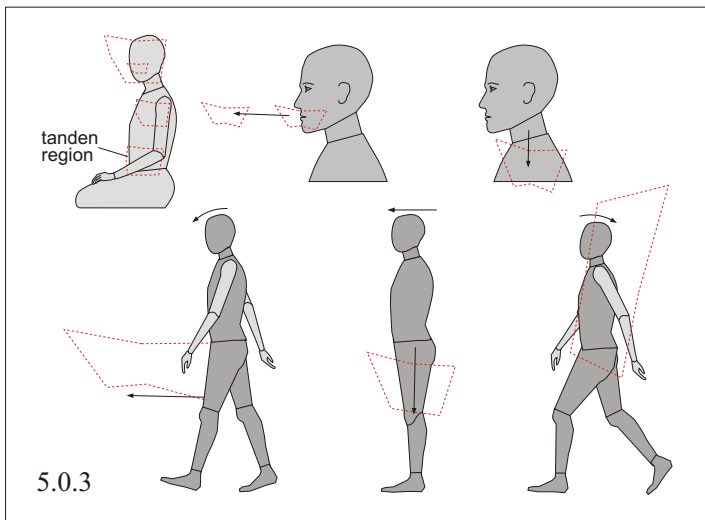
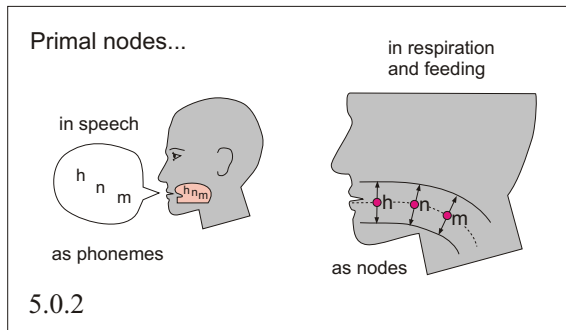
The section of the oro-pharyngeal tract in which the lingual primal nodes are located may be called the **visceral core**. "Visceral" here refers to the anterior or upper section of the "visceral body" (see Romer, Alfred Sherwood. 1972. "The Vertebrate as a Dual Organism: The Somato-Visceral Animal." *Evolutionary Biology* 6:121-156.), and term "core" indicates that this region is a factor at a fundamental level. (Details not covered here).

The series h/n/m are the primal nodes of the **visceral core** because, situated in the oral visceral tract, they control the peristaltic wave motion of the upper visceral respiratory-feeding tract, which is the essential and primitive function of the tract. This tract is **tubular** and lies along a longitudinal linear axis. The h/n/m nodes are situated along the axis and each one is coactive with its **complementary** tract section of the tube wall surrounding the node, *fig. 5.1.1*. Forces can be directed centrifugally from the central node outwards toward the wall, or in the opposite, centripetal direction. /h/, /n/ or /m/ can be produced with **primacy** assigned to either the central node or to its complementary circumferential wall section, or as



a **merger** that combines both. **Naming** the h/n/m/ series in terms of phonetics is a matter of practicality. They are primitively functions of feeding and respiration and are only secondarily evolved for vocalizing, but since they are most easily evidenced in their role in speech, it is convenient to refer to them as such, *fig. 5.0.2*.

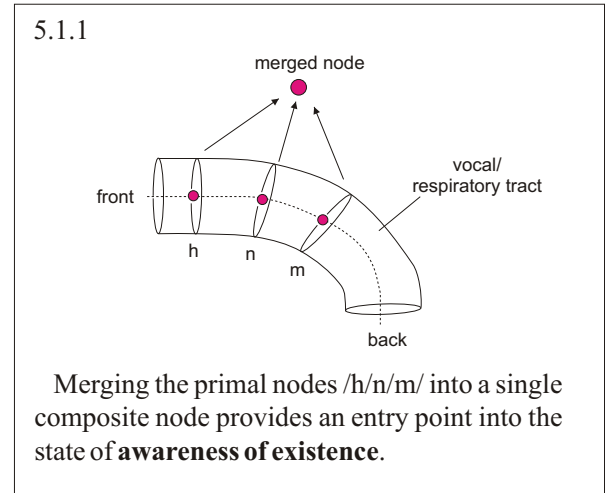
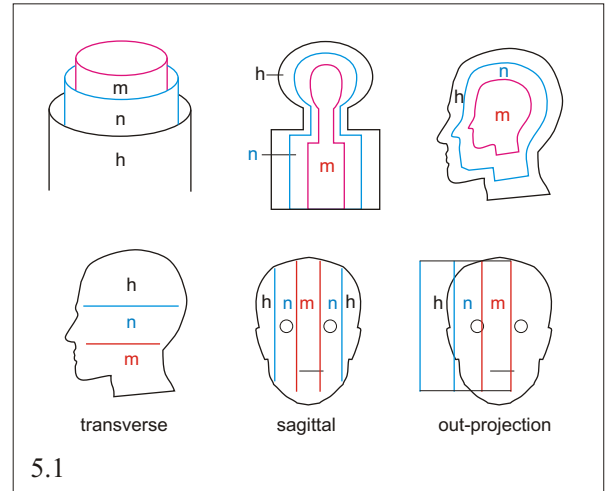
Essentially being a feeding and breathing tube, the visceral core is, in body-mind actions, usually **projected** away from a body centered location. Its size and shape, likewise, varies with the projection. Moreover, it can appear in any intra-corporal or extra-corporal location. For instance, in walking at an average pace the visceral core is forwarded from the body and is usually approximately at waist level, depending on posture and speed of walk, *fig. 5.0.3*.



5.1 The primal nodes in the trimeric body layers

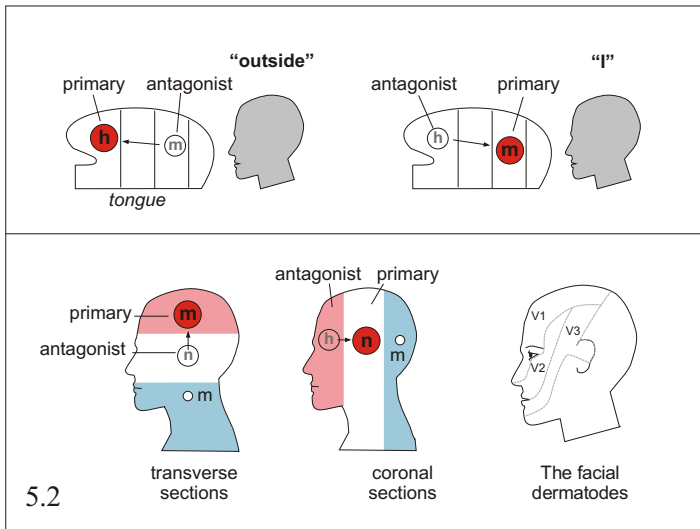
The primal nodes /h/, /n/, and /m/ are monadically tied to the perception of the **three** body layers in all projections. /h/ is integral in the framework of the perception of the outer layer, /n/ with the middle, and /m/ with the innermost one, *fig. 5.1*.

Generating the isolated perception of each is therefore also connected with perception, respectively, of the outer world, of attention, and the self. **Merger** of isolated primal nodes duplicates the effect of merging of the three layers, i.e., it produces a clear mental space.



5.2 Primary vs. secondary forces in trimerism

Assignment of primary role among trimeric divisions is automatic in normal behavior. But by voluntarily assigning primacy or secondary role to /h/, /n/, /m/ or other divisions we can control mental states. For example, in the division of the tongue or the head, **primacy** can be allocated to any node or section. In /h/ primacy outward attention will be dominant, whereas in /m/ primacy the sense of self will dominate, *fig. 5.2*. Note that the number of facial dermatomes also numbers three.



5.3 Mergers of tripartite divisions

Tripartite divisions can be **merged**. (Merger involves breathing and projective action, and is not covered here in detail; many persons can spontaneously execute mergers without instruction). It is through **variation** in mergers that the outer and the inner bodies (self) can be united in specific ways. It is possible that Lin Chi's four categories (of host and guest) are at one level varying patterns of antagonist pair role assignments and their mergers. The diagrams on inward and outward attention offered in Douglas Harding's book *On Having No Head* refer to such inward-outward directed antagonist forces and their projections.

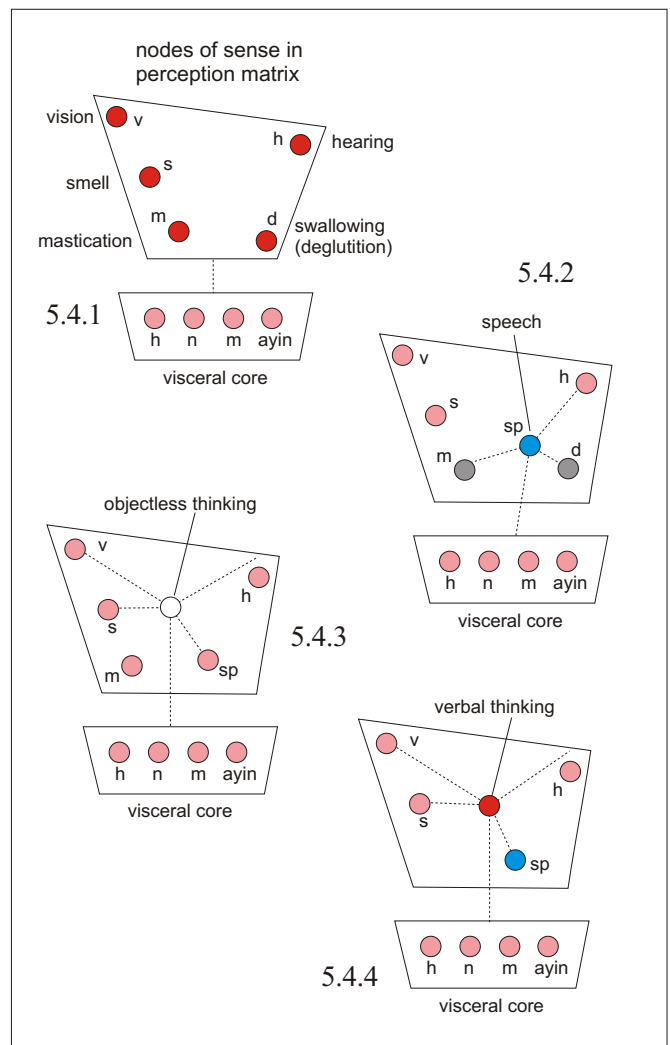
5.4 The node matrix of perception and thinking

The visceral core is closely connected with the **matrix** of the nodes of **sense perceptions**. The muscular frameworks of each sense perception is a nodal structure and these nodes are distributed in the head, in this case, as the matrix shown in *fig. 5.4.1*. Combinations of sense and thought functions are generated through their nodal mergers. In normal behavior this matrix is always merged with the visceral core. All these nodes may be projected **outside** the head and may be linked with **any** primal node. These nodes are easiest to locate with eyes closed.

Independently generated, disengaged from other framework structures these sense perception nodes are "**empty**", i.e., the node of vision, for example has no "life" of its own unless it is merged with the node of awareness, i.e., when it is cognized.

Speech is produced from a complex variable merger of the nodes of thinking, hearing, mastication, deglutition, voice, etc. Various other mergers between a sensory node matrix and the visceral core can be indicated. Vision + /n/ = attention to vision, olfaction + /m/ = self is one with odor, vision+ speech = reading. The speech node lies at a low and posteriorly placed region because it also involves the forces of non-cognitive laryngeal (phonational), and pulmonary pressure nodal functions, *fig. 5.4.2*.

Objectless thinking involves the **balanced** merger of all the sensory and speech nodes combined with one or more primal nodes of the visceral core. When there is an object one or more nodes become primary agents. **Visual thinking**, for instance, appears when the merged nodes of thinking and seeing are primary. In **verbal thinking** the merged thinking and speech nodes are primary, *fig. 5.4.3*.



6. APPENDIX

Experiment 1 - phoneme articulation and finger coactivity

Setup: hold arm with forearm horizontal and hand palm up, **maximally** relaxed. Rotate forearm to enter range where fingers partly open. See figs. (a), (b) and (c).

Action 1: with attention on the fingers, but without looking at them, separately produce forcefully the three phonemes /h/, /n/, and /m/, without vowels.

Alternatively, produce the syllables /hi/, /n+neutral vowel), and /ma/ and note the same results.

Observation 1: each sound activates, or initiates the **flexure** of particular fingers: /h/, /n/, and /m/ respectively move the thumb-plus-index, the middle, and the fourth-plus-fifth fingers. Here respiration combines the thorax and abdomen, but when isolated the two modes differ: in abdominal breathing the fingers **extend**.

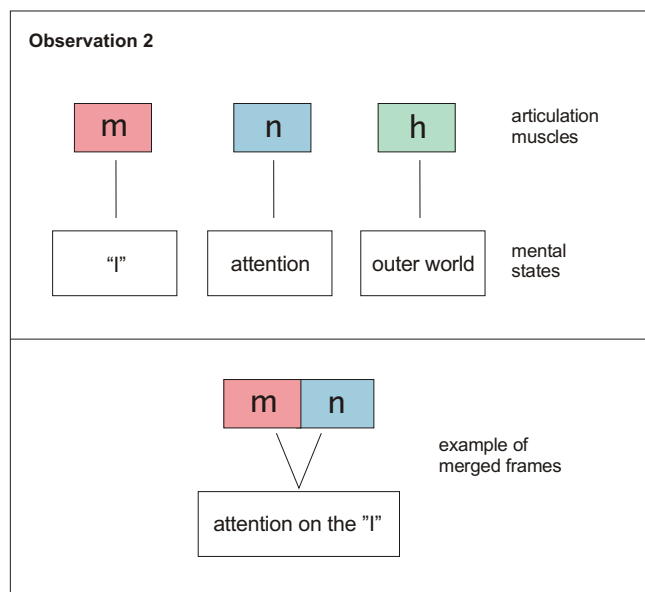
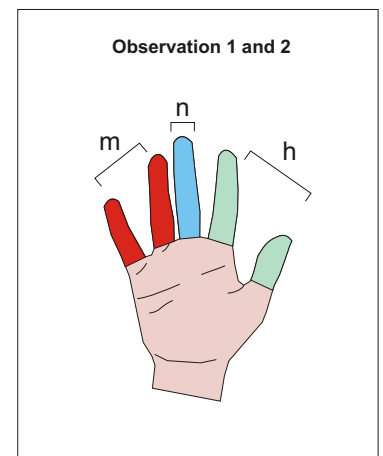
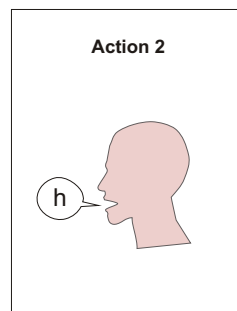
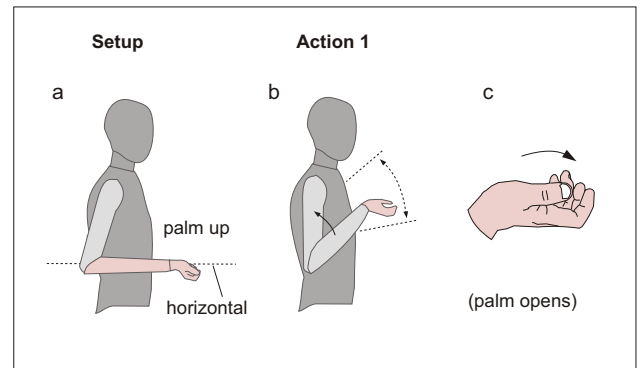
Action 2: merely producing the three sounds, examine which of three mental contents, (a) perceiving the outer world, (b) objectless attention, or (c) sense of the "I" (or "self") most spontaneously associates with which particular vocalization.

Observation 2: the following associations will occur:

- /h/ - outer perception
- /n/ - objectless attention
- /m/ - the "I" or "self"

Each configuration comprises a single frame. Combining two or three frames yields mergers, e.g., /m/+/n/ = attention on the "I". This topic relates to gesticulation, cognitive embodiments, religious and meditative vocalizations and hand gestures, cf. "hoshannah", "halleluya", "amen", "mu", "om-mani-padme-hum", etc.

Conclusion: this experiment documents inherent coactions between particular phoneme articulations, finger movements and mental settings.



Experiment 2 - some facial muscles associated with mental states

Action: locate and familiarize with the muscles indicated. With eyes closed, and body, head, upper visceral region neutralized continuously press with fingers the symmetrically paired points. Observe which of the following mental states most spontaneously associates with a particular muscle: (a) perceiving the outer world, (b) objectless attention, or (c) the "I" sense.

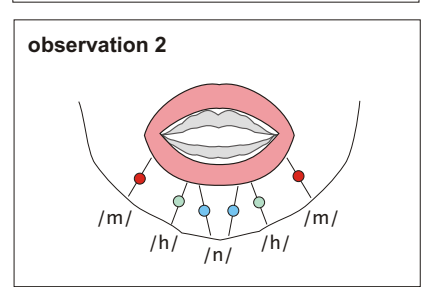
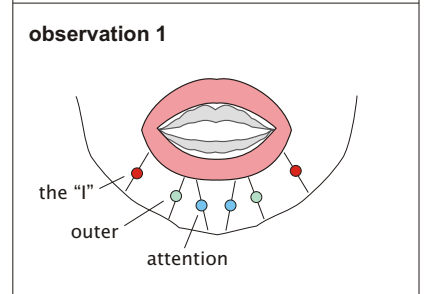
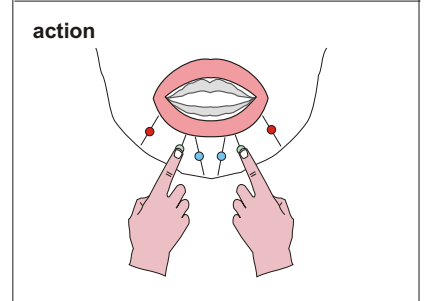
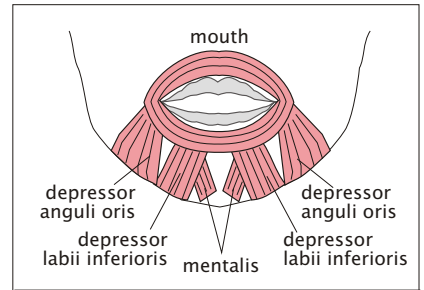
Observation 1: (a) pressure on the *depressor anguli oris* associates with the "I" sense

(b) pressure on the *depressor labii inferioris* with outer perception

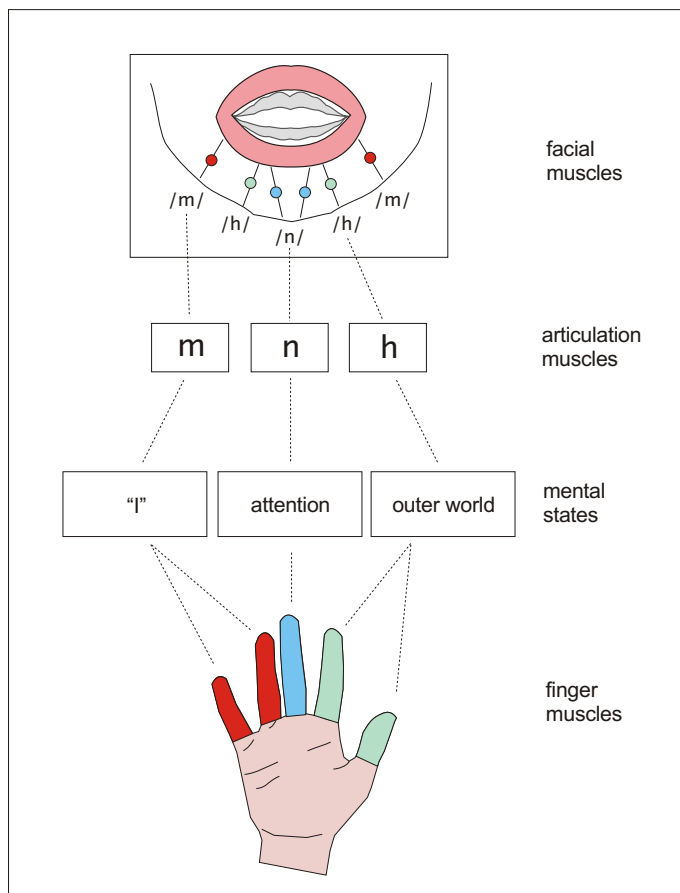
(c) pressure on the *mentalis* with objectless attention.

Observation 2: Note that pressure on each muscle is also associated with germinally or fully articulating one of the phonemes /h/, /n/ and /m/.

Conclusion: experiments 7 and 8 integrating four frames: (a) sound articulations; (b) facial muscles; (c) finger movements; and ((d) mental states document monadism, frame organization, and connection of mental and bodily functions. The mapping of these frame associations necessarily reflects a corresponding **neuromuscular** dimension of this map.



Map of four frame associations



Additional parts of extended /m/ frame

