

MEDITATION FROM NEUROLOGICAL AND ROSICRUCIAN PERSPECTIVES

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Abstract:

Meditation, a technique that frees the mind from distractions and allows for communication with the Master Within, can lead to numerous physical, mental and spiritual benefits. Meditation is a unique state of consciousness with associated changes in the physiological and neurochemical functions in the brain. Neurological investigations provide insights into the mind-brain relationship and the physical and psychological effects of meditation, but questions remain unanswered.

La Méditation des Points de Vue Neurologique et Rosicrucienne

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Abstrait:

La méditation, une technique qui libère le mental de distractions et permet la communication avec le Maître Intérieur, peut apporter de nombreux bienfaits physiques, mentaux et spirituels. La méditation est un état de conscience particulier qui correspond à des changements dans les fonctions physiologiques et neurologiques dans le cerveau. Des investigations neurologiques nous donnent un aperçu de la liaison mental - cerveau ainsi que des effets physiques et physiologiques de la méditation, mais des questions restent sans réponse.

La Meditación desde Perspectivas Neurológica y Rosacruz

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Extracto: La meditación, una técnica que libera a la mente de distracciones y le permite comunicarse con el Maestro Interno, puede llevar hacia numerosos beneficios físicos, mentales y espirituales. La meditación es un único estado del consciente con asociados cambios en las funciones fisiológicas y neuroquímicas del cerebro. Los estudios neurológicos proveen una percepción interna de la relación mente/cerebro y los efectos físicos y psicológicos de la meditación, pero quedan preguntas sin respuesta.

Mediação de Acordo com as Perspectivas Neurológicas e Rozacruz

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Sumário:

A meditação, uma técnica que libera a mente das distrações e facilita a comunicação com o Mestre Interior, pode levar a numerosos benefícios físico, mental e espiritual. A meditação é um estado original de consciência com mudanças associadas nas funções

fisiológicas e neuroquímicas no cérebro. As investigações neurológicas fornecem introspecções no relacionamento da mente-cérebro e nos efeitos físicos e psicológicos da meditação, mas algumas questões permanecem sem respostas.

Meditation aus der neurologischen, sowie der rosenkreuzischen Perspektive.

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Zusammenfassung: Meditation, eine Methode die den Verstand von Ablenkungen befreit und die Kommunikation mit dem inneren Meister erlaubt, kann auch zu manchen physischen, geistigen und spirituellen Vorteilen führen. Meditation ist ein besonderer Zustand des Bewusstseins mit assoziierten Veränderungen in der physiologischen und neurochemischen Funktion des Gehirns. Neurologische Untersuchungen brachten Einsicht in die Zusammenhänge von Gehirn und Verstand und die physischen und psychologischen Folgen der Meditation; doch verbleiben unbeantwortete Fragen.

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INTRODUCTION

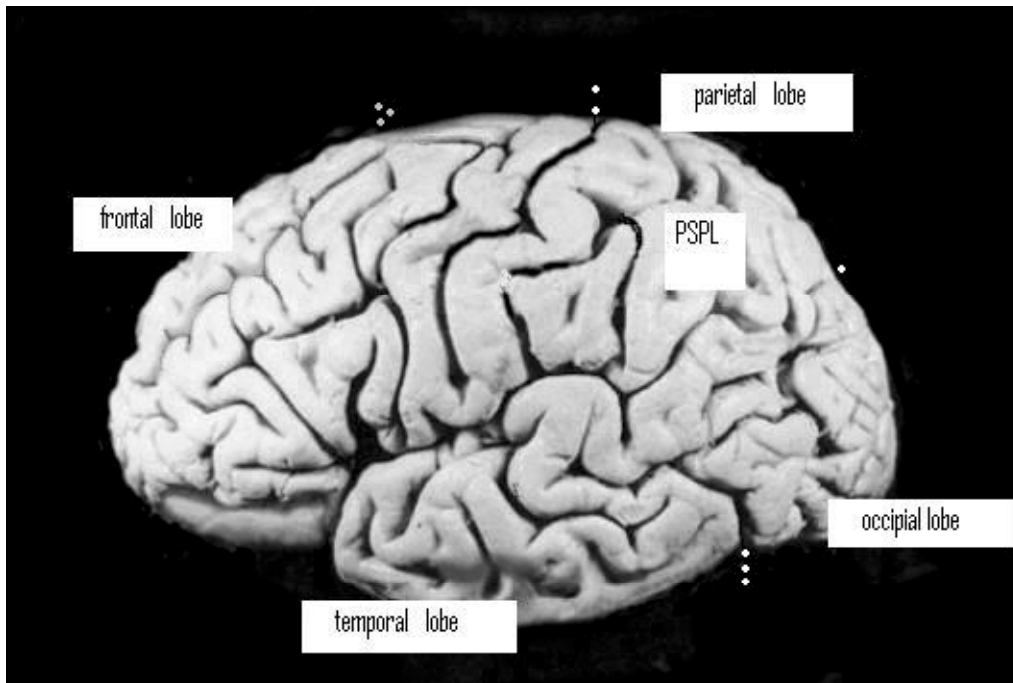
“Meditation” requires definition. Standard dictionaries are of little help: “thinking deeply or spiritually about a subject” fails to capture the essence of meditation and does not differentiate it from ordinary cognitive processes.¹ Yet it is different! Rosicrucians know that meditation is more than relaxation, concentration, contemplation or posturing. It is neither a religion, quiet stupor nor an equivalent to yoga. Meditation is a technique or method of freeing one's mind from emotions and other distractions to allow deeper insights into ourselves and the world around us, including other beings and nature. It goes beyond ordinary thought and links us with inner truths and gives us insight into *knowing* they are true. The ultimate goal, Illumination, is uncommonly achieved. However, along the path, peace and relaxation, quieting of the emotions, insights and perspectives are achieved. The mind connects with our inner selves, the Master Within.

In meditation, we relax, quiet the ego, focus our attention on a “seed thought” while maintaining a deferential, open and nonjudgmental attitude. There is a reduction in our perception of our immediate environment, which allows our minds to be differentially receptive and creative, not distracted by ordinary biological/human needs and desires.

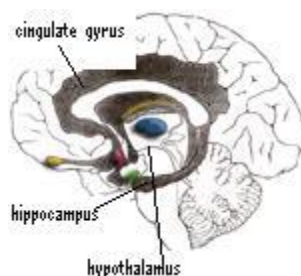
THE MIND

What is meant by “the mind”? The mind is immaterial, but it is clearly intimately related to the function of the brain, a material but marvelous, incompletely understood organ. (Figures 1 A and B show the various lobes of the brain.) This is reflected in the Rosicrucian concept that the mind is the resultant of Spirit Energy (vibratory energy of the material world, negative in polarity) and the Vital Life Force (the Soul, also of vibratory energy, but immaterial, derived from and part of the Cosmic and of positive polarity). Freud divides the mind into three levels: the conscious mind, the preconscious mind and the unconscious.² The *conscious mind* provides the immediate awareness that we experience in the ordinary, awake and attentive state. This is compatible with the Rosicrucian concept of Spirit and material matters. The *preconscious* consists of information that we have processed or are processing that is not in our full awareness but is readily available to us if we so choose or if it achieves immediate relevance.

An example would be a previously “ignored” image that later comes to our attention, e.g., a familiar face appearing in a crowd. The *unconscious*, analogous to the *subconscious* in Rosicrucian writings, is generally inaccessible to the conscious mind without special techniques (e.g., meditation, dreams and hypnosis) or unusual epiphanies. In a mystical experience the mind taps into the unconscious, via its interaction with the Master Within. (“The Master Within,” used in a Rosicrucian context, is a term interchangeable with the “Inner Self.” The Master Within is intimately associated with the Soul, conscience and Cosmic Consciousness and is a source of wisdom and guidance. The Master Within can best be approached when the ego is quieted and one can turn the mind inward.) Such inner communication also relates to insights into the archetypal significance of certain symbols, e.g., the cross, circle, triangle, square and variations on these.



[Figure 1a (above): View of the brain showing the major lobes of the cerebral hemispheres, the most highly evolved part of the human brain. The lobes are labeled. The central sulcus, separating the frontal from the parietal lobe begins directly below the vertically paired white dots. The single white dot demarcates the occipital from the parietal lobe and the three vertical white dots separate the occipital from the temporal lobes. The prefrontal portion of the frontal lobe lies to the left of the three clustered gray dots.]



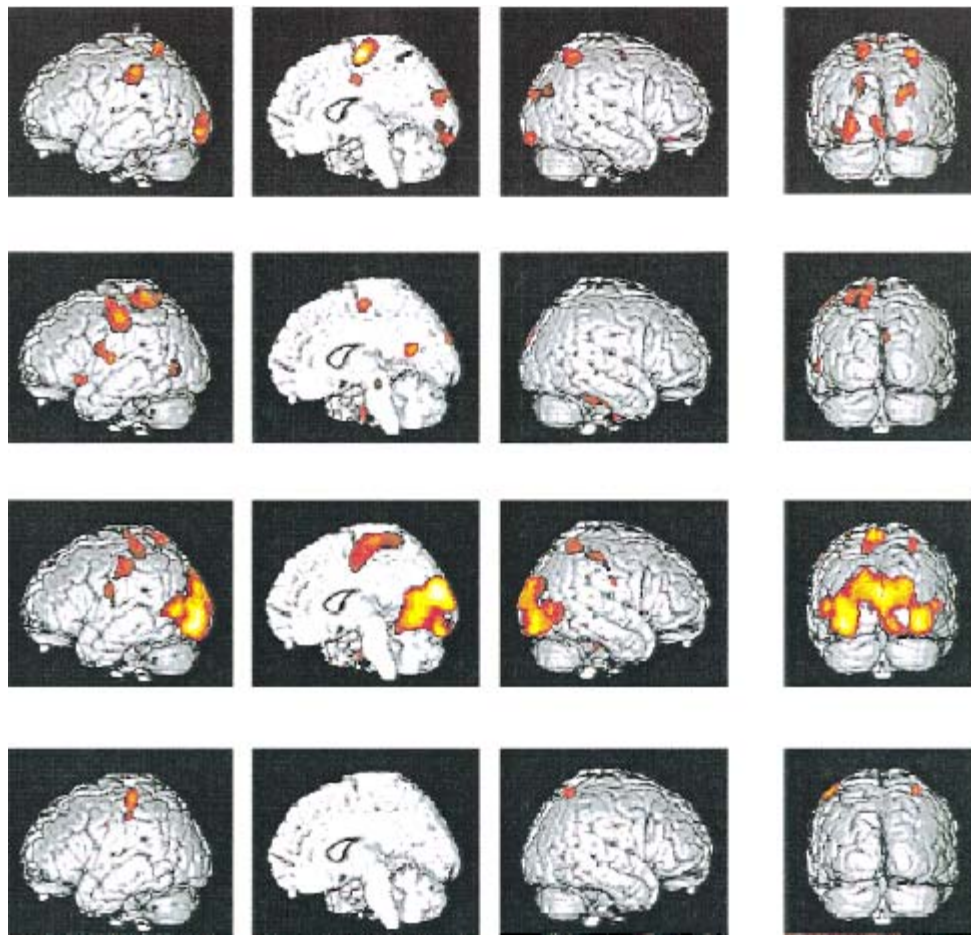
[Figure 1b (above): The inner surface of the cerebral hemisphere, showing with various components of the limbic system (involved in memory and emotions) labeled.]

MEDITATION

In meditation the usual frameworks of time, space and other aspects of conscious content are absent, although the mind is not asleep. Meditation is thus a unique state of consciousness, and this idea has been confirmed in various studies of brain function compared to other states of consciousness, either wakefulness (full alertness or restful

wakefulness) or sleep (including both REM [the rapid-eye-movement state in which we dream most vividly] and “slow-wave sleep”).³ Compared to quiet or slow-wave sleep, in which brain blood flow is reduced, meditation shows no reduction in total brain blood circulation or perfusion (tissue circulation).

Regional maps of brain blood flow/perfusion differ among meditation, slow-wave sleep and wakefulness. Positron emission tomography (PET), single photon emission computed tomography (SPECT) and functional magnetic resonance imaging (fMRI) allow examination of changes in regional blood flow, metabolism or receptor (sites of neurochemical and drug actions) activation in the brain in response to various tasks (see Figure 2). Some studies have compared meditation tasks with restful wakefulness.⁴ Test results at baseline are mathematically subtracted from the meditative state. Such studies thus show changes in blood flow or metabolism that are related to the task. Most types of meditation, which involve an initial focusing of attention, are associated with increased regional blood flow or glucose metabolism in the prefrontal and cingulate cortex, areas that are important in selection of a mental task.^{5 6 7} During visualization regional blood flow increases in the “visual cortex” and visual association areas in the occipital lobes (see Figures 1a and 2). In contemplation of “self” the parietal lobes on both sides are activated.⁸



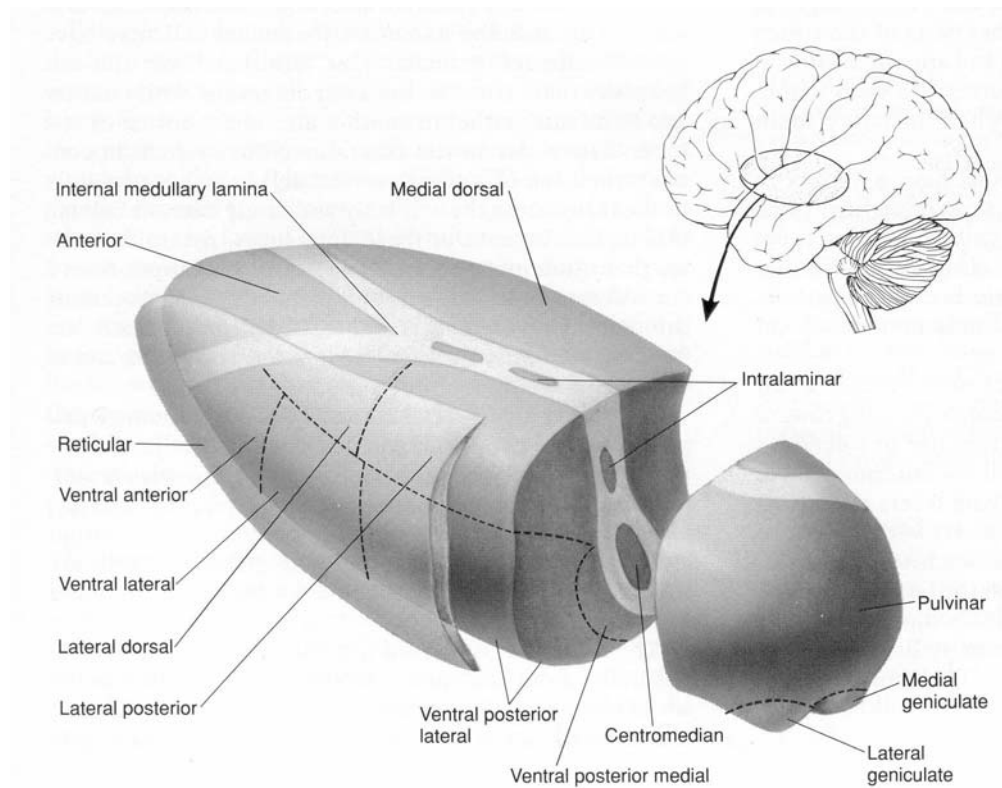
[Fig 2 (above): Cerebral activity pattern of four stages of meditation vs. normal consciousness (all with auditory stimulation). Each horizontal row shows brain activity with different meditative tasks. The first picture of each row shows the outer (lateral) aspect of the left side of the brain, the second the inner aspect of the right cerebral hemisphere. The third picture of each row shows the outer aspect of the right side of the brain and the 4th frame shows the back part of the brain, especially the occipital lobes and the cerebellum. The right side of the brain is on the right and the left is on the left for the last frame. The experience of emotional and volitional detachment is combined with meditation on weight of body parts (upper row), abstract perception of joy (second row), visual imagery (third row) and symbolic representation of the self (lower row). Characteristic differential flow activities are supplementary motor area and parietal, left parietal and speech, visual (except the primary visual cortex) and anterior parietal, and parietal regions, respectively. In addition, focal hippocampal activity is prevalent (poorly seen in the perspectives chosen). Normalized values, $P < 0.01$, mean of nine subjects.⁹]

The frontal lobes, especially the prefrontal regions (see Figure 1a) help to organize, prioritize, plan and focus attention. They are especially active during our conscious, goal-directed activities and are closely related to our concept of “ego.” Although the focusing of attention is an initial component of meditation, its other aspects require non-directed, perceptive activity. It is of interest that electroencephalographic (EEG) studies during meditation reveal continued, awake-and-aware type activity in the mid and posterior part of the brain, while the frontal lobes show greatly modified, simplified activity. Frontal midline theta, a slower, idling rhythm predominates. Quantitative EEG studies show reduced nonlinear dynamic complexity (a measure of the variety of frequencies of brain rhythms and how they change over time) of frontal lobe function, compared to restful wakefulness.¹⁰ This has been interpreted as the “switching off” of previously active neuronal networks. This may be equivalent to maintaining focus but relinquishing the executive role of the frontal lobes (quieting the ego). This is still compatible with the studies of regional blood flow and glucose metabolism (mentioned above), indicating focusing and selection of attention.

THE THALAMUS AND HIPPOCAMPUS

The thalamus, a deep gray matter structure in the brain (Figure 3), serves as a relay station and filtering station for sensory information that reaches the cerebral cortex for further processing. The filtering is mainly performed by the reticular nucleus, which covers the rest of the thalamus like a thin shield. The reticular nucleus receives direction for this filtering aspect by various centers, including the prefrontal cortex.^{11 12} Preliminary studies suggest that during meditation the thalamus filters sensory input to part of the parietal lobe (the posterior superior parietal lobule or PSPL) that is involved in “body awareness,” i.e., distinguishing the self from the external world.^{13 14} Two studies have shown decreased activation of the PSPL during meditation.¹⁵ The increased thalamic blood flow during meditation implies that this is an active process of filtering of information and processing of information about the body.¹⁶ This, along with

modification of prefrontal function, allows the meditating person to lose the distinction between self and “everything else.”



[Figure 3 (above): The thalamus, a deep gray matter structure. The oval on the diagram of the brain shows the relative size and shape of the thalamus, which lies deep to the cortex or outer part of the cerebral hemisphere. The various nuclei of the thalamus are shown. Note that the reticular nucleus, shown as a transparent sheet, lies on the outside of the other thalamic nuclei and is strategically placed to gate outflow from the various thalamic nuclei to the cerebral cortex.¹⁷]

Some studies during meditation show increased activity in the hippocampus or inner aspect of the temporal lobe.¹⁸ The hippocampus is part of the limbic system and has close functional connections with the hypothalamus and autonomic nervous system. Thus, during meditative practice there is enhanced opportunity for the autonomic nervous system to integrate with those aforementioned parts of the brain that show increased activation without the constraints imposed by ego-directed activity. This is compatible with Rosicrucian teachings on the key role of the autonomic nervous system in psychic phenomena.

NEUROCHEMICAL CHANGES

A number of neurochemical changes in the brain occur in concert with the above-mentioned physiological-anatomical alterations in activity. When breathing and heart rates slow down, as they do in meditation, there is decreased activity of a center in the brainstem known as the locus ceruleus.¹⁹ The locus ceruleus produces and transports norepinephrine, a neurotransmitter and neuromodulator that acts on higher centers. The end result is that there is decreased sensory activation of the PSPL and less stimulation of the hypothalamus (see Figures 1 and 2) to secrete adrenocorticotrophic hormone that circulates in the blood to stimulate the adrenal glands to produce cortisol, a stress hormone.²⁰ In addition, relatively greater activity of the parasympathetic than sympathetic nervous system in meditation leads to decreased production of the catecholamines, epinephrine and norepinephrine – other stress hormones, by the adrenal medulla. This could again benefit patients with hypertension and other adverse effects of these hormones. There is evidence for increased brain serotonin during meditation.²¹ Serotonin is important in regulating mood (e.g., the antidepressant effect of the antidepressants known as specific serotonin re-uptake inhibitors [SSRIs] relates to increased serotonin activity in the brain). In addition to elevating mood, serotonin can stimulate increased production of acetylcholine, involved in memory mechanisms and attention.^{22 23}

BENEFITS

Meditation has a number of general, potentially beneficial physiological effects, which follow directly from its effects on brain control centers:

1. Oxygen consumption, a measure of the general metabolic rate of the body, is reduced by 16%, even greater than the reduction of 12% in sleep²⁴
2. Neural structures that are intimately related to the control of the autonomic nervous system are activated.
3. Activity of the sympathetic nervous system is reduced: Galvanic skin response decreases, phasic changes in blood pressure are diminished and the heart rate is slowed.
4. The diurnal, cyclic secretion of stress hormones (adrenocorticotrophic hormone, cortisol and beta-endorphin) is absent.

There have been few, carefully controlled studies that demonstrate a beneficial effect of meditation on various health conditions.²⁵ While these remain to be done, there is preliminary evidence that meditation may benefit some subgroups with hypertension (high blood pressure) and asthma.^{26 27 28}

Psychological benefits that can help us in our day-to-day lives include:

1. Improved concentration and attention, allowing for greater productivity, problem-solving, creativity, learning ability and organization of memory
2. Enhanced self-image

3. Less “catastrophic reaction” to stressful situations, e.g., in survivors of attempted suicide²⁹
4. Better sociability and tolerance
5. Improved mood

More importantly, meditation moves us closer to self-mastery, a prime goal of Rosicrucians. It facilitates communication with Master Within and allows insights beyond ourselves that are not limited by time or space. Meditation helps us move along the path toward illumination and Cosmic Consciousness and provides numerous benefits along the path. While meditation is a sacred act, it should be an essential component of the daily life of every Rosicrucian. As a meditating scientist commented, “It's like coming home.”³⁰ This observation rings true for Rosicrucians, who find great comfort, benefit and inspiration from its daily practice.

UNRESOLVED ISSUES – NEW FRONTIERS

There are, of course, a number of unresolved issues, some of which probably defy scientific explanations or approaches:

1. Although we can understand how the various lobes and neurotransmitters function during meditation, how are these actions directed and by whom? A neuroscientist presented the various control centers of the brain, using the analogy of a piano keyboard. A perceptive senior scientist asked, “But who is playing the piano?” No one in the room full of neuroscientists could answer.
2. What accounts for the actual *awareness* of the experience and of self and where are they perceived?
3. How do we actually *know* that something is true and meaningful? What accounts for this conviction?
4. The link with the Master Within and with Cosmic Consciousness has not been explained and cannot be approached from a neuroscience perspective.

Although science gives us some insights into the mind, it cannot explain the mystical aspects of human nature. However, this does not diminish the validity and great benefits, including ultimate Enlightenment, psychic experiences and absent healing, that can be found through meditation and related activities.

ACKNOWLEDGEMENT

The author is grateful to Ingrid Hutchinson for advice in the preparation of the manuscript.

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