Within the last decade, Western psychologists have begun to investigate the processes by which meditation may induce changes in mental experience. Most recently, several authors have hypothesized that through the manipulation of attention, most systems of meditation alter consciousness by inhibiting cognitive functions associated with the dominant or left cortical hemisphere. Ornstein (1975), for example, has suggested that meditation can be considered a method of "turning off" the verbal, linear and analytic style of processing associated with the normal waking state. Similarly, Prince (1979) has proposed that meditation interferes with the functioning of the dominant lobe such that the sense of time, logic and verbal processing no longer dominate consciousness. In association with this proposed left hemisphere inhibition is a hypothesized shift to a non-dominant or right hemisphere specific mode of experience which has been described as holistic, receptive and beyond language or logic (Bakan, 1971; Fischer, 1975). Indeed, Davidson (1976) has even argued that meditation may lead to the development of dormant right hemisphere associated abilities. Support for the right hemisphere theory of meditation is derived principally from descriptions of the phenomenology of meditative experience, comparisons of cognitive task performance of meditators and non-meditators, and electrophysiological investigations. However, consideration of data from similar sources suggests that the cortical hemispheres are affected similarly by meditation and that inhibitory and excitatory influences within each hemisphere may be generated and evolve as meditation practice progresses. In the following discussion, a review of these data will be presented with the aim of delineating the role both hemispheres may play in the production of meditative states of consciousness.
Verbal activity and meditation

Evidence in support of the right hemisphere theory of meditation may be found in the descriptions of meditative experiences and in discussions of the impediments to successful practice. In the literature of yoga, the antithetical nature of verbal analytical thought to the meditation process is often expressed in the form of a warning. For example, Blofeld (1977, pp. 38-9) in commenting on the symbolic aspects of mantra meditation, has written,

> Successful contemplation does not, however, require careful reflection upon the symbolism ... Such interpretations are naturally of interest, but it is necessary to stress that reflection upon the symbolism forms no part of the contemplative practice. The mantric syllables cannot produce their full effect upon the deepest levels of the adept's consciousness if his mind is cluttered with verbal concepts. Reflective thought must be transcended, abandoned.

Statements regarding the importance of abandoning the intellect may also be found in the Buddhist literature. Humphreys (1968, p. 159), for instance, has asserted,

> Until the student can overcome this 'cocoon of discrimination' in thought and speech he will never attain that self-realization of which the Sutra speaks at a later stage. 'Self-realization is all exalted state of inner attainment which transcends all dualistic thinking and is above the mind system with its logic, reasoning, theorizing and illustrations'.

Indeed, the techniques of meditation seem to be designed purposively to avoid logical, verbal and rational reactions to perceived events. Sustaining attention on one object as in one-pointed concentration, naming or noting stimuli successively as they enter consciousness as in Buddhist mindfulness, and maintaining a visual mode of imagery combined with concentration as in tantric practice, all appear to reduce abstract thought and verbal associations.

It is clear, however, from the descriptions of these techniques that the extent to which meditators engage in verbal activity may vary across the types of meditation practice and according to how successful any particular meditation may be. During the practice of one-pointed concentration, verbal thoughts may arise in several forms-verbal association to perceived events unrelated to meditation, verbal reactions to meditation-induced experiences, and verbal recognition and discrim-
ination of changes in the direction and quality of attention. While thoughts of the first category are easily avoidable given adequate motivation, thoughts associated with the meditation process are more difficult to escape. For example, because the early phase of this type of meditation involves discrimination of proper from improper meditation, it is likely that meditators initially utilize a verbal recognition strategy to monitor their progress. Specifically, the meditator may use a method by which he identifies the condition of "attending to the meditation support" and discriminates it from "not attending to the support." After a certain amount of experience or upon instruction from a teacher, the meditator relinquishes the use of this inner voice in his meditation efforts. Ironically, it is acquisition of the logical concept that thinking about meditation interferes with the very process of meditation that leads to a reduction of dualistic and verbal thought.

For the more advanced meditator, the problem is of a slightly different nature. Changes in the state of consciousness induced by meditation may include the evocation of images, emotions and an increased feeling of power. Such changes not only disturb attention, but may alter the motivational state of the meditator. Involvement in these phenomena may lead to increased verbal reflection upon their nature and a lessening in the will to overcome their attractive qualities. Like the initiate, the experienced meditator is taught or comes to realize that involvement with these phenomena may lead to a slowing of meditation progress. Thus, the meditator once more abandons a habitual way of reacting to perceived events.

While similar considerations are relevant to the practice of Buddhist mindfulness, verbal notation and the development of discrimination describes both the technique and major consequence of the practice. Mindfulness entails the successive labeling of the objects of consciousness as they appear without further elaboration. Thus, while a verbal-analytic style of processing information is avoided, the technique cannot be described as a holistic non-verbal process. While automatization of this cognitive strategy probably leads to less and not more dominant lobe activation (Earle & Pikus, 1981)*, the practice may lead to finer and finer discriminations of mental and behavioral phenomena suggesting that left hemisphere abilities may be facilitated as meditation experience is gained.

*Automatized tasks, such as counting, for example, appear to be associated with large amplitude EEG alpha activity indicative of cortical inactivation, while other types of arithmetic tasks induce attenuation of alpha activity. The ability to carry out such well learned tasks also appear to be spared in most cases of cortical brain damage suggesting that sub-cortical processes may control such functions (Lezak, 1976; Brain, 1969).
In tantric meditation, in which visual imagery is utilized, the limited role of verbal activity appears obvious. However, in the initial development and manipulation of the complex and ritualized meditation imagery support, it is likely that a verbal-visual strategy is chosen. Furthermore, in many traditional mantram meditations, the initiate is directed to imagine both ideographic and representational images.

Mental Activity and Meditation

While it is possible that meditation is designed to reduce verbal-analytical thought, most manuals of meditation emphasize that the intention of practice is to inhibit all mental phenomena. Obviously, this includes day dreams, internal and external perceptions and somatic feelings which may have a right hemisphere basis. Verbal thoughts may be inhibited initially because their existence may be tied directly to an active mode involving the shifting of attention or strategies of discrimination. As meditation becomes a learned process, however, passively experienced phenomena such as hypnogogic hallucinations may become more prevalent. The meditator, at this point, is usually instructed to ignore such phenomena and to maintain his/her attentional focus on the meditation support. Alternatively, if distracting thoughts seem too overwhelming, they are at least briefly incorporated as an object of meditation. In most systems of meditation, the meditation leads to a state in which all mental constructions disappear from consciousness. In commenting upon yoga, the Indian philosopher Behanan (1964, p. 214) has written

The objective that the yogin lays before himself in practicing the exercises is the complete elimination of thoughts, or rather that of getting behind thoughts, i.e., transcending the activities and fluctuations of the citra or mind-stuff. The ideal is not reached until all thoughts are suppressed. To the mind as such, yoga attaches no importance, regarding it as an obstacle or veil, so to say, that hides the true self. When the yogin succeeds in suppressing the activities of the mind by means of his mental exercises, then he is said to have realized himself. This is the "pure consciousness" unmarred by the modifications of the mind-stuff which usually result in sense-perception, reasoning, intellectual activities, etc.

Similarly, in a discussion of the various types of Zen practice, Yasutani, as quoted by Kapleau (1965, p. 45) has taught

Shojo Zen provides the answer to this need. It has as its aim the stopping of all thoughts so that the mind becomes a complete blank and enters into a state called mushinjo, a condition in which all sense functions have been eliminated and the faculty of consciousness suspended.
The aim of mindfulness in Indian Buddhist tradition also is directed towards the creation of a state in which no objects arise into consciousness. In addition, detachment or a release from emotional influences is sought as a major component of meditation and its aftereffects. Goleman (1972) has written of a summit state of insight meditation (nirvana):

Insight is now on the verge of its culmination; noticing is keen, strong and lucid. All mental formations are instantly known to be impermanent, painful, or without self, just by seeing their dissolution. All formations are seen either as limited and circumscribed or as devoid of desirability, or as alien. Detachment from them is at a peak. Noticing no longer enters into or settles down on any formations at all. Then consciousness arises that takes as its object the 'signless, no-occurrence, no-formation': In nirvana, physical and mental phenomena cease entirely (pp. 23-4).

Finally, while tantric practice may systematically utilize visual imagery in the search for objectless awareness, the use of such a strategy is self-extinguishing. Blofeld (1974, p. 126) in summarizing the tantric path has stated:

The essence of this tantric method is to start with visualization of an appropriate being; the body, speech and mind of the adept must then be united with the Body, Speech and Mind of that which is visualized; then both adept and object are merged and finally ‘banished’so that nothing is left but pure Mind resting in stillness.

It appears then, that in advanced stages of meditation, only the exercise of attention occupies the mind. Thus, whether the contents of consciousness be visual, verbal, sensory or emotional or whether they originate from the left or right cortical hemispheres, the eventual impact of meditation is the same. Inhibition or most functions in both hemispheres may underlie the higher meditative states of consciousness.

EXCITATORY PHENOMENA

Although successful practice of meditation may lead to functional inhibition and a reduction in cortical activity, excitatory phenomena in the form of visual hallucinations, spontaneous emotional feelings and somatic illusions are often reported. Experienced during the early and middle phases of meditation practice, these phenomena are reported by meditators using both concentration methods (Carrington, 1978; Deikman, 1963; Kapleau, 1965) and mindfulness techniques (Kornfield, 1979). Because similar phenomena may be induced primarily through electrical stimulation of the right hemisphere (Baldwin, 1970; Penfield & Perot, 1963) or after injury to this area...
(Hecean & Badaraco, 1956), it is possible that meditation may lead to a condition in which the non-dominant lobe is disinhibited. However, while less frequently reported, verbal hallucinations may also be produced during this phase of practice (Serbida, 1975). Moreover, olfactory and gustatory hallucinations, verbal and motor perseverations and intense myogenic discharges may be induced, suggesting that wide areas of the cortex may be disinhibited (Carrington, 1978; Harris, 1975). One factor that may determine the types of phenomena experienced may be the nature of the meditation support. For example, hallucinations or distortions might tend to occur in the same modality as the perceived meditation object. Meditating on one's reflection, for example, may initially produce visual distortions, followed by archetypical hallucinations and eventually lead to the disruption of the sense of three-dimensional space (Luce, 1975).

In the case of concentration on the breath, hallucinations may even be of a particular type (e.g. white light experience). However, this factor cannot explain why meditation on a visual image (kriya yoga) and a verbal mantram (T.M.) can produce the kundalini experience which has both visual and somatic components (Sannella, 1979). Knowing the type of meditation support also does not explain why some meditators report hallucinatory phenomena, while others do not. Finally, the nature of the meditation object probably does not explain why there is a disparity in the frequency of visual and verbal hallucinations. Given the complexity of these various factors, then, it seems unlikely that a simple model that identifies disinhibition of one area of the brain as the underlying cause, is an entirely adequate construct.

Perhaps the most compelling evidence for the right hemisphere theory of meditation is the growing amount of data suggesting that the control of attention may be a right hemisphere specific function. Mesulam & Geschwind (1978) have described the symptoms of a number of right hemisphere damaged individuals who show dramatic impairments of selective attention. These symptoms include inability to direct and maintain vigilance, distractibility, incoherent thought and an apathetic demeanor. The non-reactivity of right hemisphere lesioned patient, or the so-called "neglect syndrome," has been shown to be associated with a defect in the orienting response to sensory input (Critchley, 1949), a reduction in reaction time to auditory stimuli (Howes & Boller, 1975), and a
lack of autonomic responsiveness to visual stimuli (Marrow, Urtrinski, Youngjai, & Boller, 1981). In studies of vigilance with commissurotomized epileptics, Dimond (1979) has reported that unlike performance with the left hand or right hemisphere, right hand performance showed a steep decrease in the detection of visually presented signals. Moreover, when signals were not detected, the number of additional signals needed to evoke a response was significantly higher when the right hand was responding in comparison to the left hand condition.

Assuming then that attention is controlled by the right hemisphere, it seems justifiable to conclude that the practice of meditation induces relative right hemisphere activation. However, similar to practice of mindfulness with regard to left hemisphere functioning, automatization of sustained attention most likely leads to decreased levels of activation. Presumably as sustained attention becomes effortless, subcortical mechanisms may begin to operate more efficiently in subserving this function. In the initial stages of meditation, however, relative right hemisphere activation might be expected.

MENTAL TASKS AND MEDITATION AFTEREFFECTS

Several investigators have claimed that as a consequence of meditation, cognitive task performance may improve, performance may become more stable, and susceptibility to stress may be reduced (Appelle & Oswald, 1974; Blasdell, 1973; Orrne-Johnson, 1973). However, few studies of the aftereffects of meditation have included control procedures that would rule out the effects of self-selection in the ability examined, differences in the motivational level of meditators and control subjects, and experimenter bias. Those studies which have included such controls procedures have generally found that meditation does not lead to increased levels of performance (Frumkin, 1979; Yuille & Sereda, 1980).

Nevertheless, some investigations of the effects of meditation on cognitive abilities have suggested that right hemisphere specific abilities may be facilitated. For example, several reports have demonstrated that meditators in comparison to control subjects show faster reaction times on simple visual reaction time tasks (Appelle & Oswald, 1974; Holt, Caruso, & Riley, 1978). Using a more powerful design, Pagano & Frumkin (1977) reported that on a right hemisphere specific musical task, experienced meditators performed significantly better than either a less experienced group or non-meditator.
control group. Although no pre- to post-meditation effect was observed, the authors concluded that meditation-induced increments in ability might be too small to be detected over a short period of time. Recently, rather significant increases in perceptual ability have been observed as an immediate aftermath of meditation and after only two weeks of practice (Dillbeck, 1977). In contrast, other investigators have found that meditation (transcendental meditation) has no effect on pursuit rotor tasks (Williams & Herbert, 1976; Williams, Lodge, & Reddish, 1977), or mirror-tracing tasks (Williams, 1978), Raven’s progressive matrices, (Yuille & Sereda, 1980) or on iconic memory task (Frumkin & Pagano, 1979). Assuming that these tasks involve a right hemisphere component, it is apparent that if meditation does have all impact on right hemisphere abilities, it is undramatic and selective in character.

Studies of left hemisphere abilities and meditation have also yielded mixed results. While some studies have found that meditation has no effect on short- or long-term verbal memory (Yuille & Sereda, 1980), others have found that verbal memory may be facilitated (Abrams, 1977). Similarly, while verbal-analytic performance has been found to be actually lower in meditators than in controls (Schwartz, 1974), meditation has been reported to increase arithmetic performance (Miskinian, 1977). Because of the methodological problems mentioned previously, it is unclear how these data should be interpreted. It does seem clear, however, that no impact of meditation on hemisphere associated abilities is implied by the pattern of results.

**ELECTROPHYSIOLOGICAL EVIDENCE**

**EEG Synchronization and Meditation**

Perhaps the most distinguishing EEG characteristic of meditation is unusually high intra- and interhemispheric synchronization. While highly correlated bilateral activity has been observed in meditators during the initial meditation (Farrow, 1976), and as a meditation aftereffect (Levine, Herbert, Haynes, & Strobel, 1977), it appears to be associated with sustained concentration (Cazard, 1972; Fehmi, 1971), subjective state reports of “pure awareness” during transcendental meditation (Orme-Johnson, 1977) and to be much higher than during sleep or drowsiness (Banquet & Sailhan, 1974; Levine, 1975). Nevertheless, recent investigations of sleep EEG have indicated that higher values of synchronization or coherence are found during REM sleep in comparison to NREM sleep.
This finding suggests that there might be physiological similarities between REM sleep and meditation. Banquet, Haynes, Russel & Re­lier (1978) have even argued that the characteristics of REM sleep in transcendental meditators indicates that meditation may act as a substitute for this stage of sleep. The authors point out that meditation may reduce the number of REM periods experienced over the night, the average number of REMs for a REM period as well as time within the REM stage. Relevant to this hypothesis are other reports which have linked medita­tion to increases in dream vividness (Kornfield, 1979) and recall (Reed, 1978) and, of course, reports indicating that med­i­tation itself may induce dream-like images and primary process thinking (Prince & Savage, 1966). Recently, electrophysiological and cerebral blood flow studies have indicated that the right hemisphere may be dominant during REM sleep (Goldstein, Stoltzfus & Gardocki, 1972; Hirshkowitz, Karacan, Meyer, Ware, & Saki, unpublished manuscript; Hirsh­kowitz, Ware & Karacan, 1979). Given the similarities between meditation and this sleep stage, it is possible that meditation may be mediated by the right hemisphere as well.

However, in the classical literature of yoga, the summit state of awareness associated with meditation is described as a state similar to dreamless sleep or that sleep state in which no mental objects are perceived. Furthermore, a number of reports have suggested that unlike visual fantasy activity, med­i­tation does not reduce the REM rebound effect after REM deprivation (Butters, 1976; Cartwright, Butters, Weinstein, & Kroeker, 1977). Since this paradigm has been the one most often used to assess whether particular types of cognitive activity can "substitute" for REM, it appears doubtful that the substitution hypothesis is correct. Finally, Banquet et al. (1978) also reported that meditation may have dramatic effects on NREM sleep as well as on REM sleep, suggesting that meditation may substitute for sleep, but is not specific to the sleep stage. In summary, then, these considerations do not justify indirect conclusions regarding REM, meditation and right hemisphere specialization. It is possible, however, that like REM dreams, meditation-induced visual hallucinations may be subserved by a disinhibition of the non-dominant lobe.

Other EEG reports of coherent activity during meditation tend to favor a bilateral hypothesis. High anterior-posterior coherence has been found in both hemispheres during meditation (Farrow, 1976; Levine, Herbert, Haynes, & Strobel, 1977), while in the performance of non-verbal spatial tasks, there is a tendency for synchronization to be higher in the right hemisphere than the left (Beaumont & Rugg, 1979; Shaw, Brooks,
Colter, & O'Connor, 1979; Shaw, O'Connor, & Ongley, 1977). Although it is possible that differences in the dominant frequencies associated with meditation and cognitive task performance may invalidate any comparison between the two, the intrahemispheric data does not suggest a non-dominant lobe specialization for meditation.

**EEG Amplitude} Frequency and Meditation**

Greater support for the right hemisphere theory of meditation is found in EEG studies that have focused on the parameters of amplitude and frequency. Glueck and Strobel (1975), for example, reported that transcendental meditators at the beginning of their meditation exhibited an increase in alpha density (8-13 Hz) in the dominant hemisphere followed one to two minutes later by a spreading of activity to the non-dominant lobe. Similarly, when subjects were asked to meditate using their own style of meditation, Ehrlichman and Wiener (1980) found forty seconds of this activity was associated with greater alpha or slow wave (2-13 Hz) activity in the left hemisphere in comparison to the right. Furthermore, out of seventeen tasks involving the utilization of either verbal or visual strategies, the meditation condition produced the greatest mean asymmetry. Assuming an increase in alpha activity is indicative of lower arousal or activation, the data suggests that the initial stages of meditation are associated with greater deactivation of the left hemisphere than the right.

In contrast to these reports, a number of authors have been unable to find asymmetry differences between meditation and resting baseline conditions (Bennett & Trinder, 1977; Brown, Fischer, Wagman, & Horrom, 1977-8; Earle, 1977) or left hemisphere specific tasks (Bennett & Trinder, 1977; Brown, Fischer, Wagman, & Horrom, 1977-8). Bennett and Trinder (1977), for example, reported no alpha asymmetry differences between a 20-minute transcendental meditation and left or right hemisphere specific tasks when asymmetry values were compared within subjects (N = 16). In addition, the authors reported that an across-subject comparison of meditation with a relaxation group produced no significant results. It is possible that some of these across-study discrepancies may be explained by differences in the time over which asymmetry was assessed during meditation. As was observed by Glueck and Stroebel, right hemisphere dominance during meditation appears to be transient; thus, using long periods of meditation to compute asymmetry ratios may obscure rapid changes in lateralization.

The transience of relative right hemisphere activation during
meditation was examined in a study carried out by the author (Earle, 1977) using subjects trained in breath concentration.

Figure 1. Mean left hemisphere (P3) / right hemisphere (P4) full wave (1-40 Hz.) power ratio during the mathematics (M), baseline (B), and experimental recording sessions for the meditation and control groups. For the meditation group—M<2; p<.05, M<B, 4; p<.06. Greater relative right hemisphere activation is up.

After two weeks of training or after completing 12 meditations of one hour in length, six meditators were asked to meditate for 18 minutes while parietal activity was recorded. In comparison with values associated with an arithmetic condition (successive subtraction of 7’s from 200 for 2 minutes), meditation was associated with a higher left to right hemisphere ratio of full wave power (1-40Hz) during the initial six minutes of meditation (first 2 minutes p<.05; next 4 minutes, p<.06) but not during the last 12 minutes.

Figure 2. Mean full wave power (1-40 Hz.) for the left and right hemispheres (P3, P4) during the mathematics (M), baseline (B), and meditation period for the meditation group.
Inspection of power values at each electrode site revealed that in comparison to values associated with the arithmetic condition, full wave power increased more in the left hemisphere compared to the right during the first third of the meditation when alpha activity was prominent. This was not the case, however, during the rest of the meditation when slower activity was also found.

Even though the right hemisphere may be in ascendancy only during the initial stages of meditation, EEG amplitude data does suggest that meditation may have long-term effects on right hemisphere specific abilities. Bennett and Trinder (1977) found that as a group, meditators exhibited greater asymmetry differences between visual and verbal tasks. Similarly, the present author found that while an arithmetic condition was significantly left-lateralized from a baseline condition for a trained group of meditators, this was not true for an untrained group. Greater EEG asymmetry differences between verbal and visual tasks has been associated with spatial orientation and superior ability (Fiore, 1978). Thus, in concordance with Davidson's contention, it is possible that meditation may lead to greater right hemisphere specific abilities. Recently Westcott (1976) in an alpha asymmetry study of transcendental meditation, reported that meditators showed a higher degree of relative right hemisphere activation (lower right to left ratio of activity) in comparison to a group of control subjects. Because relative right hemisphere activation has been found to be correlated positively with performance on spatial tasks (Davidson, Taylor, & Saron, 1979; Furst, 1976), Westcott's findings add further support to the notion that meditators are spatially oriented. However, it must be pointed out that data does not directly confirm Davidson's hypothesis that meditation leads to greater right hemisphere abilities. Further research is necessary to determine if meditation is responsible for increases in spatial ability or if spatially oriented individuals are more attracted to meditation than individuals lacking this ability.

Finally, EEG investigations that have focused on the physiological correlates of meditation practiced by advanced or experienced meditators have found little evidence that amplitude asymmetry is associated with deep meditative states. Banquet (1973) did report a transient asymmetry in fast wave activity in association with "pure awareness," a deep state of transcendental meditation. Fast wave activity appeared initially in the left frontal region and then spread to more posterior and lateral regions of the cortex. Other researchers, however, have not reported such asymmetries (Brown, 1977; Das & Gastaut, 1957). With regard to slower frequencies that
often dominate the record of advanced meditators, symmetry of activity is apparently quite noticeable. Cade & Coxhead (1979) have asserted that with increasing practice, alpha and theta activity increase both in amplitude and symmetry. In agreement with these results are the findings of Herbert and Lehmann (1977) who found that theta bursts were about equal amplitude in the records of some advanced T.M. meditators and in only two cases did gross asymmetries (> 30%) favor one hemisphere or the other. Thus, it appears that meditation in its more advanced forms leads to a condition in which both hemispheres undergo similar changes.

Other Physiological Evidence

While the majority of laterality investigations of meditation have involved electrophysiological measures, a few reports utilizing other indices of lateralization have been carried out. Similar to the EEG data, little evidence has been found in support of the right hemisphere hypothesis. In contrast to the EEG amplitude asymmetry data (Westcott, 1976), meditators do not exhibit a bias towards leftward reflective eye movements (Spanos, Rivers, & Gottlieb, 1978). Because such a bias is associated with superior spatial ability (Tucker & Suib, 1978, a note; Hamad, 1972), the data indicating that meditation may facilitate right hemisphere specificabilities is not supported. In a study of regional cerebral blood flow changes during meditation, Jevning and Wilson (1981) have found bilateral increases in blood flow. This pattern of excitation can be contrasted to spatial task performance (Gur & Reivich, 1980; Risberg, Halsey, Wills, & Wilson, 1975) and REM sleep (Hirshkowitz, Ware, & Karacan, 1979) in which flow is higher in the right hemisphere in comparison to the left.

Finally, although no neuropsychological studies of meditation have been carried out, Dewhurst and Beard (1970) have studied a number of epileptic patients who have experienced mystical states as part of their auras. There is no indication from their report that the site of the lesion is an important variable in determining the character of their aura experience.

In conclusion and summary, it appears that the phenomenological and psychological data on meditation does not fully support the right hemisphere hypothesis. What it does seem to suggest is that in the early stages of meditation, relative right hemisphere activation may be induced through the control of attention, the use of visual imagery and the inhibition of verbal-analytical thought. During the advanced stages of meditation, however, cognitive functions associated with each
hemisphere are either automatized or inhibited, leading to a reduction in cortical activity or diminished cortical participation in the generation of mental phenomena. The degree of asymmetry exhibited by meditators in the early stages of meditation may vary according to the type of meditation they are engaged in, the particular object or objects of meditation they are utilizing and on individual differences. During the advanced stages of meditation, these factors probably become less important in the production of meditation experience.

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