

MEDITATION AND  
MODERN PSYCHOLOGY

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MALOR BOOKS

This is a Malor Books publication  
An imprint of ISHK  
171 Main St. #140, Los Altos, CA 94022

The original title of this work, *The Techniques of Meditation and their Implications for Modern Psychology* was published in *On the Psychology of Meditation* by Claudio Naranjo and Robert Ornstein ©1971 by Viking Compass

First Malor Edition © 2008 by Robert Ornstein  
ISBN: 978-1-933779-63-8

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Library of Congress Cataloging in Publication Data  
for an earlier hardback edition is as follows:

Library of Congress Catalog card number: 76-149270

*“The supreme importance of the problem for all kinds of human values, as well as scientific matters, prompts us to search ahead of the evidence from time to time as science advances for any possible new insight. Even a partial solution that would enable us to decide between very broad and general alternatives — like whether consciousness is cosmic or individual, mortal or immortal, in possession of free will or subject to causal determinism, and the like — could have profound and far-reaching ideological implications.”*

— Roger Sperry

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## Preface to the 2008 edition

I wrote this essay in 1970, when meditation was a curiosity, known only to a few tie-dyed people and, of course, the Beatles. There were spasms of “Transcendental Meditation” burgeoning, a few obscure Zen centers, odd Yogas, and more.

I wanted to see if there was anything to it and, if so, what it told us for human development and our psychology. I found that, all over the world, people had found that similar techniques (you’ll have to read the book) yielded similar results. There was method in their method, not madness.

Yogis stare at an object, dervishes repeat a phrase, Zennies concentrate on the inexplicable questions such as “show me your face before your father and mother met.”

What are they doing? Recycling the same information through the nervous system, and this has positive effects, if under control and well organized. It provides a respite from ongoing noise of the world and the insides of plans and worries. It is even used in relaxation.

But it also, as I have written here, leads to a different mode of perception.

That’s where it was, 38 years ago, and this book now looks like a good basic introduction to the high-tech research

that followed (I used mere electroencephalographs). I looked in March 2008 on Google for “meditation” and either “psychology,” or “cognition,” or “neuroscience.” There are 140,000 entries!

Now PET scans reveal changes in the brain during meditation, now corporate Human Resources Managers run meditation classes, it’s taught in evening classes, and in high school and even in prisons. The book gives an idea of why.

Robert Ornstein  
March 2008

## Foreword

This essay is the result of a long process of learning that I didn't really know what I thought I knew. I had studied much of the Western psychological literature on consciousness until I thought I knew. As I began to look elsewhere, to Zen, to Yoga, to the Sufis, I began to understand how little progress we had made in the analysis of the nature of consciousness, and that the richness of the Eastern psychologies had much to offer us. This essay is my attempt to begin to encompass the concepts and techniques of Eastern psychologies in Western terms. What seems to result is a strange mixture of techniques, from computers and electroencephalographs to mantra and dervish dancing.

I have many to thank for different aspects of my education, but I'll mention few. My association with Joe Kamiya allowed and allows me to absorb many of the intricacies of fancy equipment and some of the enthusiasm for physiological feedback. David Galin has been a continuous source of calm yet hysterical and wise advice on many of my vague mumblings — the many times he simply said, “What could you possibly mean by *that?*” Several of the ideas in this manuscript are at least half his.

I am indebted also to Miss Beverly Timmons for her enthusiastic organization of a study group on meditation, as well as for many points of information.

The only previous attempt to consider the practices of meditation within modern psychology has been that of Arthur Deikman. Where his essay touches on similar aspects of meditation, this analysis is similar to, and greatly influenced by, his work. I am in his debt as much for his conceptual analysis as for the demonstration that an attempt to bring meditation within psychology is possible and fruitful.

The interaction with Claudio Naranjo has been fruitful for me in many ways, beyond that of this book. Claudio and I have extremely different backgrounds: he is Chilean, a psychiatrist interested in therapy, psychedelics, etc.; I am an American interested in consciousness and psychophysiology. Early in 1969 we decided that our differences in outlook could produce an interesting book on meditation [this was the original edition, that contains an essay by Naranjo and this one], his part to discuss the experiential aspects and mine to cover the psychology and physiology. We wrote our essays geographically and temporally separated, and we found that the phenomena of the esoteric psychologies seemed to compel similar conclusions. We divided the different types of meditative exercises in basically similar ways: the concentrative form involving a restriction of attention, and an “opening up” form. Naranjo’s manuscript, *The Unfolding of Man*, provided me with many new inputs and ideas.

For reading and commenting on earlier versions of the manuscript I am indebted to Enoch Callaway, Charles Tart, Katie Kocel, Charles Furst, Ivan Pasternak, Roger Kramer — and to many others, thank you.



Thanks also to Majo Keleshian, Ann Skillion, and Ruby Collins for typing and retyping the manuscript, and to Faith Hornbacher.

I was supported during the time of writing by a fellowship from the National Institutes of Mental Health, USPHS 2 TIMH 7082-10; by a grant from the Babcock Foundation, with special thanks to Mike Murphy and Barbara Lassiter; and a grant from Janet and Merrill Bickford.

## Introduction

When we view the practices of the esoteric disciplines from the vantage point of scientific inquiry, we may put forth ideas and conceptions which to the adherents of the esoteric traditions will be minor or irrelevant. My intention is not to “reduce” totally the phenomena of the esoteric disciplines to psychological terms, but simply to begin the process of considering these aspects of the traditions which fall within the realm of a modern psychological analysis. (Several of the major tenets of these traditions remain outside this form of inquiry.) A similar point has been made by many scientists as well as by those belonging to these traditions. The physicist Robert Oppenheimer has said: “These two ways of thinking, the way of time and history, and the way of eternity and timelessness, are both parts of man’s effort to comprehend the world in which he lives. Neither is comprehended in the other nor reducible to it...each supplementing the other, neither telling the whole story.”<sup>1</sup>

If we consider a blind man interested in the phenomena of color, there are certain useful operations that he can perform on colored light. He might construct a machine that prints out (in Braille) the wavelength of light.

He might perform certain calculations on his observations, which would enable him, for instance, to predict the wavelength of a new combination of lights, in a wide variety of conditions. We do understand, however, that his analysis in terms of the numbers obtained when a new mixture of lights is combined is in an entirely different order of knowledge from that of the direct experience of color. The Sufi Idries Shah makes the same point in discussing the meaning of the word “Sufi.” He notes that many scholars have wondered about the derivation of the name and that there exist various theories — some say the word has no etymology, some identify it with theosophy, some identify it with the Arab garment of wool. Shah says:

*But acquaintance with Sufis, let alone almost any degree of access to their practices and moral traditions, could easily have resolved any seeming contradiction between the existence of a word and its having no ready etymological derivation. The answer is that the Sufis regard sounds of the letters S, U, F (in Arabic, the signs for soad, wao, fa) as significant in the same order of use in their effect on human mentation.*

*The Sufis are, therefore, the people of SSSSUUUFFFFF. Having disposed of that conundrum (incidentally illustrating the difficulties of getting to grips with Sufi ideas where one thinks only along certain lines), we immediately see a fresh and characteristic problem arising to replace it. The contemporary thinker is likely to be interested in this explanation — this idea that sound influences the brain — only within the limitations imposed by himself. He may accept it as a theoretical possibility insofar as it is expressed in terms that are regarded as admissible at the time of communication.*

*If we say “Sounds have an effect on man, making it possible, other things being equal, for him to have experiences beyond the normal,” he may persuasively insist that “This is*

*mere occultism, primitive nonsense of the order of OM-MANI-PADME-HUM abracadabra, and the rest.” But (taking into account not objectivity, but simply the current phase of accepted thought) we can say to him instead, “The human brain, as you are doubtless aware, may be likened to an electronic computer. It responds to impacts or vibrations of sight, sound, touch, etc., in certain predetermined or ‘programmed’ ways. It is held by some that the sounds roughly represented by the signs S-U-F are among those for reaction to which the brain is, or may be, ‘programmed.’” He may be very well able to assimilate this wretched simplification of the existing pattern of thinking.<sup>2</sup>*

We should keep Shah and Oppenheimer’s comments in mind, and also remember that portions of this essay may be considered, from the viewpoint of modern psychology, in just the opposite way — as too general and as yet lacking in precise experimental verification, such as which specific brain structures are involved, etc.

This essay, however, is an attempt to begin to prepare a new middle ground between two approaches and to “translate” some of the metaphors of the esoteric traditions into those of modern psychology. The first chapter contains a consideration of the communalities of concentrative meditation exercises with an eye to the common experiences these techniques produce and their possible common effects on the nervous system. This will involve retracing part of Naranjo’s path; many of the same techniques and phenomena will be considered from a slightly different viewpoint and move in a slightly different direction. The second chapter is an attempt to point out the essential similarities between the esoteric and modern psychologies of awareness and a consideration of the effects and aftereffects of the practices of meditation

on awareness. The third chapter puts forth a “new” view arising within the scientific community of the capabilities of self-regulation of internal states that man possesses, and the aid that modern technology may be in implementing this extended view of our capacity. This “new” view within science is one at least thousands of years old to those of the esoteric traditions.

## Chapter One :

### "Turning Off" Awareness

A story that appears in Philip Kapleau's *The Three Pillars of Zen* provides us with a useful point at which to begin a psychological consideration of the practices of meditation.

*The importance of single-mindedness, of bare attention, is illustrated in the following anecdote:*

*One day a man of the people said to the Zen master Ikkyu: "Master, will you please write for me some maxims of the highest wisdom?"*

*Ikkyu immediately took his brush and wrote the word "Attention."*

*"Is that all?" asked the man. "Will you not add something more?"*

*Ikkyu then wrote twice running: "Attention. Attention."*

*"Well," remarked the man rather irritably, "I really don't see much depth or subtlety in what you have just written."*

*Then Ikkyu wrote the same word three times running: "Attention. Attention. Attention."*

*Half-angered, the man demanded: "What does that word, 'Attention' mean anyway?" And Ikkyu answered, gently: "Attention means attention." <sup>1</sup>*

There are many clues in other places that meditation is primarily an exercise in deployment of attention rather

than in reason or concept formation. And yet the only major attempt in modern psychology to discuss the practices of meditation, using the concept of attention as the central element of analysis, has been that of Arthur Deikman.

An analysis of any experiential phenomenon in terms of science, in this case in terms of the psychology and physiology of awareness, is naturally more limited, restricted, and drier than actual descriptions of experience. When we try to bring experience within the limiting frame of reference of science, a great deal of the richness and complexity is lost in the attempt to gain a great deal of precision. We will be forced to consider only those points that are amenable to this type of analysis.

Another consideration in this analysis is that most techniques of meditation do not exist as solitary practices but are only artificially separable from an entire system of practice and belief. A given meditation exercise cannot be perfectly understood as an isolated technique but only as an integral part of a whole discipline. The entire process usually, but not always, involves many components, a belief structure, and various forms of concurrent practices. A major component is a detachment from, or even a renunciation of, world activity. Another is a concentration on an energy form called in Yoga *kundalini*. Its activation involves special exercises said to release a form of energy through the spine; this is often combined with special breathing exercises, *pranayama*. Self-observation, which can be considered another form of meditation, is practiced in Zen, Yoga, and Sufism.

Since the general state of our knowledge about the various forms of meditation within science in particular, and within the West in general, is extremely low, we should perhaps first set the background and review some of the general similarities of the meditation exercises. Most

involve separating the practitioner from the daily ongoing activities. He usually sits alone or with a small group in a special room set aside for meditation, or in a special place often constructed in a naturally isolated area, a quiet wood, near a waterfall, or a cave. Generally, the attempt is made to keep all external sources of stimulation to a minimum to avoid distracting the meditator from his object of meditation. This isolation is felt to be especially critical in modern cities, where random sounds or human voices can distract the person from his exercise. In most forms of Yoga and in Zen there is emphasis on maintaining a specific posture, the lotus position. This is done for the purpose of keeping bodily movements to a minimum and therefore out of awareness during the meditation period. The stiff back is said, additionally, to lessen the possibility of drowsiness in the reduced stimulation setting. Incense is often burned during meditation to provide a strong consistent background odor to keep out any small distracting changes in smells.

Instructions for most of the meditation exercises are to attend closely and continuously to the meditation object. This is more difficult than it would seem, and most beginners lose awareness of the meditation object quite often. Each time one notices that awareness has shifted from the object of meditation, the instructions are always to return awareness back to the meditation object. In many traditions, each session of meditation lasts about half an hour. In most, although not all, meditation is practiced twice a day, often in the morning before the day's major work, and in the evening. Beginners usually practice for less time and work up to about a half-hour a day, and as progress is made, more and more complicated exercises are usually given.



In terms of the psychology of consciousness, there seem to be two general varieties of meditation: those exercises which involve restriction of awareness, focusing of attention on the object of meditation or the repetition of a word (which Claudio Naranjo terms “concentrative meditation”), and those which involve a deliberate attempt to “open up” awareness of the external environment. We will consider the first form, that of “concentrative” meditation, in this chapter.

In reviewing the extraordinary diversity of the actual techniques of this form of meditation, one general similarity seems to come through. No matter the object of meditation or the superficial practice of meditation, the exercises seem to be attempts to restrict awareness to a single, unchanging source of stimulation for a definite period of time. In many traditions, successfully achieving this is termed “one-pointedness of mind.”

If the exercise involves vision, the meditator gazes at the object of meditation continuously. If the meditation is auditory, the sound, the chant, or the prayer is repeated over and over again, either aloud or silently. If the meditation consists in physical movement, the movement is repeated again and again. In all cases, awareness is directed completely on the movement, or the visual object, or the sound.

In Zen, as a first exercise, the student is instructed to count his breaths from one to ten, and on reaching ten to return to one and repeat. When the count is lost, as it will be by beginners, the instructions are that “the count should be returned to one and begun again.” After he is able to concentrate completely on his breaths, the student then begins a more advanced exercise and focuses attention on the *process* of breathing itself. He thinks about nothing but the movement of the air within himself, the air reaching

his nose, going down into the lungs, remaining in the lungs, and finally the process of exhalation. This is a convenient way to begin meditation, since breathing is a natural activity, which continues whether we will it or not. This is not an attempt to control the normal breathing as in some aspects of the Yoga and Sufi traditions, but simply to be aware of the breathing and to maintain this awareness on the breathing and nothing else.

In *What the Buddha Taught*, Walpola Rahula gives these instructions:

*You breathe in and out all day and night, but you are never mindful of it, you never for a second concentrate your mind on it. Now you are going to do just this. Breathe in and out as usual, without any effort or strain. Now, bring your mind to concentrate on your breathing-in and breathing-out, let your mind watch and observe your breathing in and out; let your mind be aware and vigilant of your breathing in and out. When you breathe, you sometimes take deep breaths, sometimes not. This does not matter at all. Breathe normally and naturally. The only thing is that when you take deep breaths you should be aware that they are deep breaths, and so on. In other words, your mind should be so fully concentrated on your breathing that you are aware of its movements and changes. Forget all other things, your surroundings, your environment; do not raise your eyes and look at anything. Try to do this for five or ten minutes.*

*At the beginning you will find it extremely difficult to bring your mind to concentrate on your breathing. You will be astonished how your mind runs away. It does not stay. You begin to think of various things. You hear sounds outside. Your mind is disturbed and distracted. You may be dismayed and disappointed. But if you continue to practice this exercise twice a day, morning and evening, for about five or ten minutes at a*

*time, you will gradually, by and by, begin to concentrate your mind on your breathing. After a certain period you will experience just that split second when your mind is fully concentrated on your breathing, when you will not hear even sounds nearby, when no external world exists for you. This slight moment is such a tremendous experience for you, full of joy, happiness and tranquility, that you would like to continue it. But still you cannot. Yet, if you go on practicing this regularly, you may repeat the experience again and again for longer and longer periods. That is the moment, when you lose yourself completely in your mindfulness of breathing. As long as you are conscious of yourself you cannot concentrate on anything.* <sup>2</sup>

As the student of Rinzai Zen progresses, he learns to keep himself motionless, to sit in the quite difficult lotus position, and as he learns to maintain awareness of his breath successfully, he is given a more advanced meditation exercise.

A riddle or paradox, called a *koan*, is given him to meditate upon. To most commentators the koan has been the subject of much misunderstanding and confusion. The question-and-answer routine has seemed to be one for the Marx Brothers. The “question” may be, “Show me your face before your mother and father met.” The “answer” may be the student slapping the questioner in the face. The master asks the student, “Move that boat on the lake right now with your mind!,” and the student stands up, runs over and hits his head against the gong, turns a somersault, and lands in front of the master. Since the student answered successfully, it is quite clear that the “answers” to the koan are not to be considered logically in the sense of their being rational problems with set answers, to be solved in the usual manner of thinking through various rational alternatives and choosing one.

We might instead consider the koan exercise in the more restricted terms of the psychology of awareness. In these terms, the koan is an extreme and compelling method of forcing intense concentration on one single thought. The first koan exercise is:

*In all seriousness a monk asked Joshu, “Has the dog Buddha nature or not?”*

*Joshu retorted, “Mu!”\**

This koan is not to be taken verbally and logically, to be worked through like a problem, but as an extreme exercise in concentration. This is confirmed in instructions given in the lectures of a contemporary Zen master, Yasutani Roshi;

*You must concentrate day and night, questioning yourself about Mu through every one of your 360 bones and 84,000 pores . . . what this refers to is your entire being. Let all of you become one mass of doubt and questioning. Concentrate on and penetrate fully into Mu. To penetrate into Mu is to achieve this unity by holding to Mu tenaciously day and night! Do not separate yourself from it under any circumstances! Focus your mind on it constantly. Do not construe Mu as nothingness and do not conceive it in terms of existence or non-existence. You must not, in other words, think of Mu as a problem involving the existence or non-existence of Buddha-nature. Then what do you do? You stop speculating and concentrate wholly on Mu — just Mu! <sup>3</sup>*

Later koan exercises involve other unanswerable questions, such as “What is the sound of one hand clapping?” and “What is the size of the real you?”

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\*Mu is a word that has no meaning in Japanese.

Because no verbal logical answer to the question can be found, the koan becomes a useful and demanding focus of attention over a very long period of time. The koan becomes a meditation object, day and night, a constant and compelling focusing of awareness on a single source. The lack of a rational, logical solution forces the student to go through and to discard all his verbal associations, all his thoughts, all his “solutions” — the conceptual processing usually evoked by a question. He is then forced by the nature of the question to approach the condition known as “one-pointedness” — concentrating solely on one thing: the “unanswerable” koan.

Focusing attention is helped by the demands put on the student, by the pressures he imposes upon himself to achieve a breakthrough (to solve the koan), by the attitude of his fellow students, and by his interviews (*dokusan*) with the Zen master, the *roshi*. In the interviews the Zen student is often asked to demonstrate his level of understanding by giving an answer to the koan. Obviously, the desired answer is not verbal or logical; ideally it should be a communication of a new level of awareness brought about by the process of concentrating on the koan. The “correct” answer, which may be one of many possible ones, seems strange only on a logical level; it is intended to communicate on a different level. The koan is perhaps one of the most extreme techniques to delimit awareness.

The use of the koan is strongest in the Rinzai school of Zen, which places emphasis on sudden alterations of awareness brought about by this extreme concentration on one point over a long period of time under stress. The Soto school of Zen emphasizes another technique involving a different type of meditation exercise.

This second technique is termed “just sitting” (*shikan-taza*) and is an example of the form of meditation in which

a deliberate attempt is made to open up awareness of the external environment. The Soto method emphasizes a much more gradual development than does the Rinzai sect, which places the emphasis on sudden flashes of expanded awareness as the aftereffect of the koan exercise. The second form of meditation, that of opening up awareness while meditating, will be considered at greater length again in the next chapter.

The practices of Yoga are much more varied than those of Zen. Concentrative meditation in Yoga is only a part of the totality of activity, and each part is considered a contributing factor to alterations of consciousness. Many Yoga practitioners devote much of their time to attempts to alter basic “involuntary” physiological processes -- blood flow, heart rate, digestive activity, muscular activity, breathing, etc. There are various reports of Yoga masters being buried alive for long periods of time, of stopping their blood flow, of walking barefoot on hot coals, etc. Anand and his associates have found that some yogis can reduce oxygen consumption to levels far below that of normal.<sup>4</sup>

A major component of Yoga involves training in breath control (*pranayama*). Different cycles of breathing are used and different depths of breathing are practiced, in order to obtain some alterations (presumably) in blood oxygen content, carbon dioxide, etc., and the resulting changes in awareness. In these attempts at altering physiological processes, Yoga differs from Zen, where there is no attempt to control breathing or heart activity. The one Zen meditation exercise that does involve breathing is one in which the student simply observes his breathing, as it occurs, rather than attempting in any way to control it. Many of the meditation exercises in Yoga are, however, quite similar to Zen.

A common form of yogic meditation practice involves the use of mantra. Mantra are often words of significance, names of the deity, but in terms of the psychology of consciousness the important element is that the technique uses a word as the focus of awareness, just as the first Zen exercises make use of breathing. The instructions are to repeat the mantram over and over again, either aloud or silently. The mantram is to be kept in awareness to the exclusion of all else. This is similar to the first Zen exercise, in that when awareness lapses from the breathing, the attention is to be returned to it. Mantra are sonorous, mellifluous words, which repeat easily. An example is OM. This mantram is chanted aloud in groups, or used individually in silent or voiced meditation. Another is OM-MANI-PADME-HUM, a smooth mellifluous chant. Similar mantra have analogous sounds such as AYN, HUM, etc., somewhat similar in sound to *Mu* in the first Zen koan. All include sonorous consonants — M's, H's, any many vowels.

Another well-known mantram is the Hare Krishna mantram. This is always chanted aloud in a group. The mantram itself involves a lot of repetition, and the entire mantram is repeated over and over.

HARE KRISHNA  
 HARE KRISHNA  
 KRISHNA KRISHNA  
 HARE HARE  
 HARE RAMA  
 HARE RAMA  
 RAMA RAMA  
 HARE HARE

A form of Mantram Yoga, “Transcendental Meditation,” has become fairly well known in the West, especially in the United States. In this form of meditation, too, the practitioner is given a specific mantram and he is to repeat it silently over and over for about a half-hour twice a day, in the morning and in the evening. No special posture is required for the exercise; rather one is instructed to assume a comfortable posture, such as sitting erect in a chair. The thoughts that arise during the meditation are considered to be of no significance, and as soon as one is aware that one is no longer focused on the mantram, attention is to be returned to it.

The specific mantra used in “Transcendental Meditation” are not given publicly, since the devotees of this technique claim that there are special effects of each one in addition to the general effects of concentration. But it can be noted here that these mantra are also mellifluous and smooth, including many M’s, Y’s and vowels, similar to OM or MU in Zen. The devotees of “Transcendental Meditation” also claim that this technique involves the essence of meditation in a form suitable for Western persons. There is no doubt that Mantram Yoga, including “Transcendental Meditation,” is a very convenient form of meditation. As in the breathing exercises, it is quite easy to produce and attend to a silent word, anywhere, at any time. Since there is no special posture required, the arduous training for sitting in a lotus position is unnecessary. If the essential component of meditation involves concentration on an unchanging stimulus, then “Transcendental Meditation,” as well as other forms of Mantram Yoga, can be said to possess this essence.

Other forms of Yoga practice make use of visual meditation techniques. The yogin generally sits in a lotus position and views a specially constructed visual image, a



mandala. Mandalas take many forms: they may be very simple, like a circle, or extremely complicated, as in the yantra of Tantra practice.

Mandalas are used similarly to mantra. The practitioner focuses his gaze on the mandala and restricts his awareness to the visual input. Any stray thought or association or feeling that arises is suppressed, and awareness is returned from the stray thought or association back to the mandala. Simple mandalas often employ a circular motif in which awareness is drawn to the center, as one continues to contemplate, fixing one's gaze more and more closely on the center.

Another visual meditation technique in Yoga involves a "steady gaze" (*tratakam*) on external objects. External objects are used in meditation to provide a focus for a fixed point of concentration, rather than for their teacher of the particular sect of Yoga, but it can be a stone, a vase, a light, a candle, etc. Rammamurti Mishra, in his manual ***Fundamentals of Yoga***, gives instructions for some of these practices.

*1. Exterior surface of the body*

*a. Nasal gaze: Keep your eyes half closed, half open, and steadily gaze at the tip of the nose. Practice regularly in the morning and in the evening; when the eyes are tired or tearing, close them fully and meditate one minute fully in that state....*

*b. Buru madhya dristi (frontal gaze): Fix your power of attention at the center between the eyebrows, turn your half-closed eyes towards the space between the eyebrows; like the nasal gaze, the frontal gaze is a powerful exercise to control wandering thoughts and mind....*

*c. Tratakam on external objects: Select a picture of a perfect yogi or respected teacher, or you can select some small round object on the wall of your room if you do not know any liberated*

*soul: a round object, a miniature, a small round point, or zero. Think of the thing selected, that is, the symbolic nature, and by gazing at the symbol you are gazing at supreme consciousness and supreme nature. Fix yourself in such a posture and position so that you may see this object easily, neither too far from it nor too near to it. Look at this object steadily, practice constantly and regularly, never gaze long enough to tire your eyes, close your eyes and meditate when your feel strained. After a few months of constant and regular practice, you will increase your power to stare at this object almost indefinitely without strain, fatigue and blinking...*

*d. Tratakam on blue light: Place a bed lamp with a blue, very low voltage bulb at the head of your bed or other suitable place so that you can gaze easily; now light the lamp and recline on the bed or in an easy chair in the most comfortable posture.... Now gaze directly at the bulb in such a way that you do not blink your eyes but the bulb is directly overhead and you are peering intently at it; your gaze must be steady and continuous and constant; concentrate fully on the bulb...<sup>5</sup>*

The repetitive processes of the body, such as breathing and heart beats, can serve as similar foci for concentration in Yoga. These techniques are described in Mishra’s manual and in many others.

Internally generated sounds (*nadam*) can similarly serve as the focus of meditation. Mishra gives some examples, of which the following are the most useful and frequent.

CIN NADAM: Like the hum of the honey of intoxicated bees; idling engine vibration; rainfall, whistling sounds, high frequency sounds

CIN CIN NADAM: waterfall, roaring of an ocean

GHANTA NADAM: sound of a bell ringing

SANKHA NADAM: sound of a conch shell

TANTRI VINA: nasal sound, humming sound like that of a wire string instrument

TELA NADAM: sound of a small, tight drum

VENA NADAM: sound of a flute

MRIDAMGA NADAM: sound of a big brass drum

BHERI NADAM: echoing sound

MEGA NADAM: roll of distant thunder <sup>6</sup>

The sounds used in meditation can be either imagined or naturally occurring. Often the yogin sits near a natural source of repetitive sound, such as a waterfall, wind source, humming of bees, and simply listens and concentrates. When these repetitious, monotonous sounds are imagined, the technique becomes quite similar to the silent repetition of a mantram.

Creation of a meditation image can extend to visual types of meditation as well. Frederick Spiegelberg, in *Spiritual Practices of India*, describes the *dharana*, or fixation of consciousness procedures — the “kasina exercises”:

*The point of primary importance is that one should really create such a meditation-image to accompany him continuously; only as a secondary consideration does it matter what this particular image may be, that is, through which one of the kasina exercises it has been produced. Instead of contemplating a disc of earth, for example, one can meditate on an evenly ploughed field seen from a distance. In the Water Kasina, the yogi concentrates either on the circular surface of water in a jar, or on a lake seen from a mountain. So, too, the fire on the hearth, the flame of a candle, the wind that sways the crests of the trees may also be used as Kasina. The exercise of Color Kasina makes use of round colored discs, and even of bright-*

*colored flags and flowers. In Space Kasina one meditates on a circular window opening, the attention in this case being directed primarily to the dimensional proportions of the opening*

*Every image that remains permanently in one’s consciousness and every enduring mood can be a help to this fixation of one’s consciousness. As a matter of fact, every hallucination, every unappeasable hatred, every amorous attachment provides a certain power of concentration to him who cherishes it, and helps him direct the forces of his being toward a single goal. This is of course more the case with the man who has achieved self-control and freedom from his passions, and who after having mastered his sense impulses succeeds in giving to his consciousness a definite turn of his own choosing . . . Every activity is of equal value as a basis for a dharana exercise. <sup>7</sup>*

The process of active construction of an image of meditation, in this particular case visual images, is elaborated in Tantra practice. In meditating on the yantra, the image is *created* piece by piece until the yogin can produce it in consciousness at will. Many of the yantras that have been drawn out on paper from memory can be found in Mookerjee’s quite beautiful book *Tantra Art*.<sup>8</sup> This type of active visualization also forms a portion of Tibetan Yoga practice. The practices of creating a meditation image have obvious advantages — one need not be present in any special place for meditation and one can reproduce any form at any time — so that many forms of meditation, like breathing and the verbal forms, can be done independently of the circumstance or the place.

Another variety of yogic meditation practice, mudra, involves repetitive physical movements, usually of the arms, legs, and fingers. In these exercises (which are somewhat more difficult to write about since no picture or word is involved) the movement of the limbs is performed

and repeated over and over in the same way as mantram. Awareness is continually directed toward the process of making the movements. Mudras vary in complexity; a simple one may involve touching the thumb to the other four fingers in order and repeating this procedure. The mudra may be combined with the mantram. For instance, the above fourfold repetitive mudra could be combined with the mantram OM-MANI-PADME-HUM, each word corresponding to the thumb's movement to a finger.

The Sufis make similar use of repetitive movements. Manuals for Sufic practice do not exist in any readily available form as they do for Yoga and Zen. The Sufis hold that the techniques must be administered, and the time, place and state of the student must be taken into account. Publication of the details of their practice would lead to faulty applications of the exercises. A technique such as meditation, for instance, is held to be useful only at a specific stage of development, and persistence in any technique after the appropriate period might be a waste of time or even harmful.

There are, however, fragmentary reports available of some of the Sufi meditation exercises, which can be summarized here. The Mevlevi (whirling dervishes) are perhaps the best known in the West. They perform a dance involving spinning and repetition of phrases. George Gurdjieff, who was trained by dervishes, explains the dance of the dervishes as an exercise for the brain based on repetition.<sup>9</sup> Idries Shah writes of these orders: "The so-called dancing dervishes accomplish trance and ecstatic phenomena through monotonous repetition circumambulations, and this is marked in the Maulavi order; most popular in Turkey."

The dance of the dervishes involves both the repetition of physical movements and the concurrent repetition of

sounds. One of the few available first-person descriptions of this dance is found in Roy Weaver Davidson’s valuable symposium, *Documents on Contemporary Dervish Communities*. It is an account by Omar Michael Burke who traveled to a Dervish assembly in Tunisia, and participated in a dervish dance.

***Explanation of the Zikr (repetition).*** *The Dhikr, it was explained to me, is a dance; or, more properly, a performance of a series of exercises in unison. The objective is to produce a state of ritual ecstasy and to accelerate the contact of the Sufi’s mind with the world mind, of which he considers himself to be a part...All dervishes and not only the followers of Maulana Rumi (as most Orientalists believe) perform a dance. The dance is defined by them as bodily movements linked to a thought and a sound or a series of sounds. The movements develop the body; the thought focuses the mind and the sound fuses the two and orientates them towards a consciousness of divine contact, which is called Hal, meaning “state” or “condition.”*

***Description of the Zikr at Nefta.*** *A double circle is formed in the center of the hall. Dervishes stand while the Sheik intones the opening part of this and every similar ceremony — the calling down of the blessing upon the congregation and from the congregation upon the Masters, “past, present and future.” Outside the circle stand the Sheik, drummer and flute player, together with two “callers,” men who call the rhythm of the dance. The drum begins to beat, the caller begins to call a high-pitched flamenco-type air, and slowly the concentric circles begin to revolve in opposite directions. Then the sheik calls out, “Ya Haadi!” (O Guide!) and the participants start to repeat this word. They concentrate on it, saying it at first slowly, then faster and faster. Their movements match the repetitions.*

*I noticed that the eyes of some of the dervishes took on a far-away look and they started to move jerkily as if they were*

*puppets. The circles moved faster and faster until I (moving in the outer circle) saw only a whirl of robes and lost count of time. Now and then, with a grunt or a sharp cry, one of the dervishes would drop out of the circle and would be led away by an assistant, to lie on the ground in what seemed to be an hypnotic state. I began to be affected and found that, although I was not dizzy, my mind was functioning in a very strange and unfamiliar way. The sensation is difficult to describe and is probably a complex one. One feeling was that of a lightening; as if I had no anxieties, no problems. Another was that I was a part of this moving circle and that my individuality was gone, I was delightfully merged in something larger.*

*[He leaves the dance, and later] I went out into the courtyard to assess my feelings; something had happened. In the first place, the moon seemed immensely bright, and the little glowing lamps seemed surrounded by a whole spectrum of colors.* <sup>10</sup>

The Sufis use other forms of concentrative meditation, some of which, in some aspects, appear quite similar to those of Zen and Yoga. Dhikrs are verbal repetition exercises. The first line of the **Koran** is quite often used for this purpose. Idries Shah thus describes the exercises:

*Having either been given a set of Dhikrs to repeat (if he is under the direct guidance of a sheik) or having selected one himself if he is a uwaysi, working towards the goal alone, his task is to repeat it meticulously with regard for the times and frequency of its saying. If the formula is said under the breath, Dhikr Kafi, a rosary with ninety-nine beads, is used, one bead being told after each repetition; in the case of the Dhikr Jali, loud repetition, the rosary is often not used; ...attending an actual Halka circle (meeting) the seeker goes to some quiet place or spends his contemplation time in a room set aside for the purpose.*

*There is, too, the exercise known as Fikr, which consists of meditation, concentration on some power that is desired or upon the immensity of the universe. When Dhikr and Fikr have been indulged in to such an extent that they become second nature, the superior form of Dhikr becomes necessary. This is the control and concentration of breath. The mind is concentrated upon a single idea, and the original Dhikr form or another is recited, this time in set rhythm corresponding to the breathing.*<sup>11</sup>

There exist fragmentary descriptions of other exercises used by the Sufis and some of their followers. A student of George Gurdjieff writes of meditating on a series of dots on a piece of paper.<sup>12</sup> The dervishes repeat the phrase “Ya hud” in a way similar to the Yoga mantra and the Zen koan *Mu*, and also repeat stories over and over in their minds, as Zen Buddhists do with the koan.<sup>13</sup>

In conventional religions more familiar to us in the West, as well as in sects less known than Yoga, Zen, and Sufism, similar kinds of meditation practices exist. In early Christianity, for example, the exercise of contemplation performed a function similar to that of meditation in Zen, Yoga, and Sufism. Jakob Bohme, the Christian mystic, practiced fixing his gaze on a spot of sunlight on his cobbler’s crystal as his object of contemplation throughout the entire day. He contemplated sunlight so much that this spot of light remained on his eyes permanently, burning part of the retina. He was then able to carry this image with him all the time, in the same way, perhaps, that the yogi can construct a yantra at will and observe it. Deikman has commented that the Christian mystics Walter Hilton and St. John of the Cross gave instructions for contemplation exercises that were strikingly similar to those of Patanjali, the author of the Yoga sutras.



*In Hilton one reads, “Therefore if you desire to discover your soul, withdraw your thoughts from outward and material things, forgetting, if possible, your own body and its five senses.” St. John calls for the explicit banishment of memory. “Of all these forms and manners of knowledge the soul must strip and void itself and it must strive to lose the imaginary apprehensions of them, so that there may be left in it no kind of impression of knowledge, nor trace of thought whatsoever, but rather the soul must remain barren and bare, as if these forms has never passed through it, and in total oblivion and suspension. This cannot happen unless the memory can be annihilated of all its forms, if it is to be united with God....” Patanjali comments, “Binding the mind stuff to a place is fixed attention, focusing the presented idea on that place is contemplation. This same contemplation shining forth on concentration.... The three in one are constraint....even these [three] are indirect aids to seedless [concentration].”<sup>14</sup>*

Some of the current practices in the Christian Church and in Judaism have some similarities and even perhaps their origins in the practices of meditation. Prayer, in general, is a practice most similar to concentrative meditation. St. John Climacus said: “If many words are used in prayer, all sorts of distracting pictures hover in the mind but worship is lost. If little is said or only a single word pronounced, the mind remains concentrated.” The “Russian Pilgrim” said: “If thou wilt that thy prayer be pure, made up of good and lovely things, thou must choose a short one consisting of a few powerful words and repeat it many times.” Many of the prayers are monotonous, repetitive chants. Judaism makes use also of ritual nodding movements and intoned prayers. Hasidism and Cabalistic tradition contain many elements similar to Zen, Yoga, and Sufism. The cross and the Star

of David appear as contemplation objects in traditions other than the Jewish and Christian; some of the yantras in *Tantra Art*, for instance, contain many six-pointed stars. Perhaps one reason for a decline of interest in these more organized religions is that the stress on altering awareness has largely been muted. And, although the techniques for altering awareness still persist, the practices have become “automatic,” part of a set ritual, lacking their original purpose.

The Prayer of the Heart in Greek Orthodox tradition, however, is much less removed from the meditative traditions considered. A similar focusing of awareness is also part of Taoist meditation. Instructions are given to sit quietly and focus awareness of the center of the body, on one point, on the abdomen. The medieval alchemists describe long and repetitive exercises — the constant redistillation of water, the prolonged grinding exercises — which were written down allegedly for the “distillation” of base metal for its transmutation into gold. These instructions can also be taken metaphorically as descriptions of attempts to alter man’s awareness from his ordinary “base” level to a higher one, symbolized by the gold.<sup>14</sup>

Peter Freuchen, in his *Book of the Eskimos*, describes a technique for meditation in which the Eskimo sits facing a large soft stone; he takes a small hard stone and begins to carve a circle in the larger one by moving the small stone continuously around and around the larger surface. This practice, similar to the creation of a mandala, often lasts for several days at a time and is designed to produce a trance state. Many primitive peoples, such as the Bushmen of the Kalahari Desert, dance in a circle facing a fire, staring at the fire, and repetitiously chanting. Some gaze continuously at the full moon, the sun, or at a candle.

This has been a fairly quick, selective review of some of the major forms of concentrative meditation. Each of the major traditions — Zen, Yoga, and Sufism — has exercises involving the different sensory modalities. A chant is repeated in each of the traditions; a word, koan, mantram, or dervish call is repeated; concentration is focused on the breath, on the heart beat, on the short prayer, longer prayer, story, or on natural sounds, such as a waterfall, or on some imagined sounds, such as the humming of bees, or on vibration. Symbols or pictures of gurus are subjected to steady gaze, and images are created only in the mind's eye of the practitioner, more like imagined sounds silently repeated. Sufi dervishes dance in a repetitive whirl; Indian yogis make continuous movements with their limbs; Taoists concentrate on the abdomen. The early Christian Fathers contemplated an object or the cross. These are all extremely different forms of the same type of meditation.

The strong common element seems to lie in the actual restriction of awareness to one single, unchanging process. It does not seem to matter which actual physical practice is followed; whether one symbol or another is employed; whether the visual system is used or body movements repeated; whether awareness is focused on a limb or on a sound or on a word or on a prayer. This process might be considered in psychological terms as an attempt to recycle the same subroutine over and over again in the nervous system. The instructions for meditation are consistent with this; one is instructed always to rid awareness of any thought save the object of meditation, to shut oneself off from the main flow of ongoing external activity and attend only to the object or process of meditation. Almost any process or object seems usable and has probably been used. The specific object of meditation (for this analysis) is much

less important than maintaining the object as the single focus of awareness over a long period of time.

Shah points out that some Tibetans repeat the OM-MANI-PADME-HUM mantra exactly backward, and the following Sufi story from his *Tales of the Dervishes: Teaching-Stories of the Sufi Masters over the Past Thousand Years* illustrates this same point:

*A conventionally-minded dervish, walking along the shore of a lake, heard another dervish give the dervish call incorrectly. Considering it a duty to correct the unfortunate person who was mispronouncing the syllables, for this was probably someone who had had no guidance and was doing his best to attune himself to the idea behind the sound, he hired a boat and traveled to the island from where the loud shout came. He corrected the other dervish, who thanked him, and he returned to the mainland, feeling satisfied with his own good deed. After all, it is said that a man who could repeat sacred formulas correctly could even walk on the waves.*

*While he was thinking like this, he suddenly saw a strange sight. From the island the other dervish was coming toward him, walking on the surface of the water. “Brother,” the dervish said when he was close enough, “I am sorry to trouble you but I had to come out to ask you again the standard method of making the repetition you were telling me, because I find it difficult to remember it.”<sup>15</sup>*

The same point is made by a Russian story of three holy men (*staretzi*) who lived in complete isolation on a small island in the Arctic Sea:

*A bishop heard of them and decided to pay them a visit. On the shore of the island he found three bearded, toothless old men who bowed low before him. The bishop asked how they prayed. The old man replied: “We pray thus: ‘Ye are three; we*

*are three; have mercy on us!’ The bishop was amazed at this and began to teach them how to pray. He taught them the Lord’s Prayer until they knew it by heart. They thanked him fervently for the lesson. Then he went aboard his ship with a glad heart for performing a good deed. His ship had been sailing for a while when strange clouds formed on the horizon, and quickly approached. Suddenly the passengers realized that the clouds were the forms of three men. The three men bowed low before the bishop and told him sadly that they had forgotten the newly learnt prayer. Would he have the graciousness and patience to teach it to them again. Then the bishop crossed himself, bowed to the staretzi and said: “God will hear your prayer as it is. There is nothing I can teach you. Go and pray for us sinners.” The bishop prostrated himself before them. But they turned around and went over the water back to the island. And until the dawn, a light streamed forth, at the place where the pious staretzi had vanished.<sup>16</sup>*

It seems that the mode of meditation, too, makes little difference. The primary effect can be considered as a central state evoked by the process of repetition. The stress on the communality of the techniques of meditation need not necessarily conflict with the contention of those of the esoteric traditions that certain forms of meditation may have *additional* specific effects on specific individuals. The Maharishi Mahesh Yogi, the originator of the “Transcendental Meditation” movement, feels that a specific mantram must be given to each individual. Shah “wretchedly simplifies” for Western observers and states that the letters S, U, F in Arab pronunciation have a *specific* effect on consciousness. At a level beyond that of this analysis, the Sufis also hold that specific tales can communicate knowledge in dimensions other than the ordinary.<sup>17</sup>

But, since the general level of knowledge within science about the actual practices of meditation is so scanty, the stress here is on the *major communality* of the techniques of concentrative meditation across disciplines, across sensory modalities.

These techniques are said in the traditions to lead to a “one-pointedness” or to a “clear” state of awareness. The state is generally described as “dark,” or in Indian terminology, “the void,” or “emptiness.” It is a withdrawal of the senses, a “turning off” of perception of the external world. In yogic practice this withdrawal is most explicitly sought. In Buddhist meditation the stress is more often on an expanded rather than restricted awareness. But recall that Rahula says, in describing the breathing meditation, that “after a certain period you will have experienced just that split second when your mind is fully concentrated on your breathing, when you will not hear even sounds nearby, when no external world exists for you.”\* Augustine Poulain describes it as “a mysterious darkness wherein is contained the limitless Good, a void, other than solitude.” St. John describes it as the “annihilation of memory.”

It may be that men in different places at different times have noticed that by repeating an action or a phrase over and over again, or continuously focusing on breathing, the awareness of the external world can be shut out. Since we, the Bushmen, the Eskimos, the monks of Tibet, the Zen masters, the Yoga adepts, and the dervishes all share a common nervous system, it is not so surprising that similarities in techniques should have evolved.

These techniques have persisted for centuries. Many sensory modalities have been employed, and many different symbols or objects within any one sensory modality have been used. This may indicate that one primary effect

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\* See page 9.

of the concentrative meditation exercises is the state of emptiness, the non-response to the external world, evoked in the central nervous system by the continuous subroutine called up by the exercise regardless of the specific nature of the input or the sensory modality employed.

There is a whole body of work on the psychological and physiological effects of restricting awareness to an unchanging stimulus. One variety of concentrative meditation discussed involves a “steady gaze” on either a natural object or a specially constructed one, a “mandala.” A very similar situation would arise if input to the eye were always the same, no matter how one moved one’s eyes.

Normally, as we look at the world, our eyes move around and fixate at various points in large movements called “saccades.” We hardly ever gaze steadily at any one object for a prolonged period of time. Even when we try to fix our vision on a single object, very small involuntary movements of the eye occur, called “optical nystagmus.” The image on the retina is kept in constant motion by both these types of eye movements.

A group of physiological psychologists succeeded in devising a system that enables a visual image to remain constant on the retina even though the eyes are in constant motion. One apparatus for producing this “stabilized” image consists of an extremely small projector mounted on a contact lens worn by the subject. The contact lens moves with every movement of the eyeball, and no matter how the eye is moved, the same image falls on the retina.<sup>18</sup>

*(See Figure 1.)*

This study of stabilized images was undertaken in psychology primarily to investigate a theory of Donald Hebb, according to which continuously varied input is needed to maintain normal awareness. It was felt that “stabilizing” the image would eliminate the continuous



*Figure 1*

changes in input that normally occur as we move our eyes in space.

The effect on awareness of stabilizing the visual image is consistent: the image tends to disappear completely. The fact that it does tend to reappear periodically in some studies is most likely due to the slipping of the contact lens on the eyes. When an image is stabilized on the retina with extreme precision, using the internal structure of the eye as the stimulus, the image disappears in a few seconds and never returns.

Lehmann, Beeler, and Fender attempted to investigate the brain state evoked by the stabilized image.<sup>19</sup> The electroencephalogram (EEG) as recorded at the scalp, consists of the tiny electrical potentials that emanate from the brain. These tiny potentials, about 5 - 50-millionths of a volt, are amplified and written out on paper by the electroencephalograph. The first brain rhythm was discovered by Berger in 1924, and termed the “alpha”



rhythm, which consists of rhythmic activity between 8 and 12 Hz. Since Berger, other rhythms have been classified: beta, defined as 12 cycles and above, theta, 4 - 7; and delta, 1 - 4. The alpha rhythm is usually thought of as representing a state of decreased visual attention to the external environment. It is increased almost always when the eyes are closed or when the eyes are rolled up into the head — when vision is turned down.

Lehmann, Beeler, and Fender recorded the EEG from the occipital cortex of the brain while their subject was viewing the stabilized image. They asked their subject to press a button when the stabilized image disappeared, and attempted to correlate the subjective experience of the disappearance of the image with the concurrent brain state. They found that the alpha rhythm was likely to appear at the time when the subject reported the disappearance of the image. Alpha rhythm, in this case too, seems associated with a decrease in awareness of the external world.

Another means of supplying consistent visual input provides the observer with a completely patternless visual field, called a “ganzfeld.” This field can be produced in many ways. A whitewashed surface can serve as a ganzfeld. Cohen, in a series of studies, produced his ganzfeld using two spheres, each 1 meter in diameter.<sup>20</sup> Hochberg, Triebel, and Seaman produced a homogeneous visual field more conveniently by taping halved ping-pong balls over the observer’s eyes.<sup>21</sup> The effect on consciousness of the ganzfeld situation is similar to that of the stabilized image.

Cohen found that some observers reported an absence of any visual experience — what they called “blank out.” This was not merely the experience of seeing nothing, but that of *not seeing*, a complete disappearance of the sense of vision for short periods of time, as Cohen puts it. The feeling of not seeing at all usually occurred after about twenty

minutes of exposure to the ganzfeld. During blank-out the observers did not know, for instance, whether their eyes were open or not, and they could not even control their eye movements. Cohen’s suggestion was that this continuous uniform stimulation resulted in the failure of any kind of image to be produced in consciousness. He also found that the periods of blank-out were associated with bursts of alpha rhythm. He suggested that the appearance of alpha during these continuous stimulation periods indicated a functional similarity between continuous stimulation and no stimulation at all. He also found that individuals with high alpha EEG’s were more susceptible to the blank-out phenomenon.

Tepas performed a study on the ganzfeld similar to that of Lehmann, Beeler, and Fender’s on the stabilized image.<sup>22</sup> His observers watched the ganzfeld for five-minute periods while EEG’s were recorded. When the observer experienced the blank-out, he was asked to press a microswitch that marked the EEG record. Tepas found that the alpha activity of the brain was increased during the period of blank-out.

Both the stabilized image and the ganzfeld situation are very similar to the practices of concentrative meditation. Consider the activity of the observer in meditation and in the two precisely regulated input situations: in both an attempt is made to provide unchanging input. Analogous is the subjective experience in both situations: a loss of contact with the external world. In all these conditions the state of the brain indicates an increase in alpha rhythm. The electrophysiological studies of meditation by Bagchi and Wanger,<sup>23</sup> those by Anand and others in India on Yoga meditation,<sup>24</sup> and those by Kasamatsu and Hirai,<sup>25</sup> and by Akishige in Japan on Zen meditation<sup>26</sup> indicate that meditation also is a high alpha state. The more precisely

controlled situations seem to produce, both psychologically and physiologically, effects similar to those of concentrative meditation.

The stabilized image and ganzfeld condition in themselves indicate that the phenomenon or blank-out, or disappearance of the stabilized image, or loss of contact with the external world, is due to effects on the central nervous system rather than on the characteristics of the peripheral senses. The effects of stabilized images are transferred between the eyes, indicating that the disappearance phenomenon must occur somewhere later in the visual system than in the retina. Stimulation in other sensory modalities (the sudden onset of a noise, for example) also returns the stabilized image back into consciousness.

It seems that a consequence of the structure of our central nervous system is that if awareness is restricted to one unchanging source of stimulation, a “turning off” of consciousness of the external world follows. Common instructions for meditation all underscore this; one is continually advised to be aware of the object of meditation and nothing else, to continuously recycle the same input over and over. Stabilizing a visual image or homogenizing visual input results in the same experience. A set of instructions by Knowles of the English mystical tradition indicates that this blanking-out is a desired function of meditation that can be produced by restriction of awareness.

*Forget all creatures that God ever made, and the works of them so that thy thought or thy desire be not directed or stretched to any of them, neither in general nor in special...At the first time when thou dost it thou findest but a darkness and as it were a kind of unknowing, thou knowest not what, saving that thou feelest in thy will a naked intent unto God.<sup>27</sup>*

The interpretations of this experience of “darkness,” of “blank-out,” of the “void,” of the disappearance of an image in the subject of a scientific experiment, would certainly differ: the subject of a physiological experiment would have extremely different expectations and ideas about his experience than a man who has sought this experience as part of his meditative practice. But the experiences themselves have essential similarities and are produced simply and through quite similar procedures.

So the practices of meditation — whirling, chanting, concentrating on a nonsensical question, repeating a prayer over and over again, picturing a cross, looking at a vase, counting breaths, etc. — are probably not quite so exotic as those who seek the exotic and esoteric would like, and are not properly considered as exercises in reasoning or problem-solving,<sup>28</sup> but rather as exercises in restriction of attention. The somewhat bewildering superficial differences in the various practices — the koan, the mantram, the mudra, the mandala, the kasina exercises, the dharana exercises, the dhikr, the fhikr, the dance of the Mevlevi dervishes, the Taoist meditation on the abdomen, the “Prayer of the Heart:” — all can be understood as aids in focusing awareness of a single process, continuously recycling the same subroutine through the nervous system. When this is achieved, a common experience seems to be produced: awareness of the external environment diminishes and “turns off” for a period of time.

Psychologically, continuous repetition of the same stimulus may be considered the equivalent of no stimulation at all. The two situations, which from the psychological and physiological points of view are quite similar, insofar as they restrict awareness to that of a single source of unchanging stimulation, also seem to produce the same effects. So we can say (within our frame of reference) that concentrative meditation is a practical technique which uses

an experiential knowledge of the structure of our nervous system to “turn off” awareness of the external world and produce a state of blank-out or darkness, the “void,” the cloud of unknowing. The techniques of concentrative meditation are not deliberately mysterious or exotic<sup>29</sup> but are simply a matter of practical applied psychology.