THE DAWN OF THE AGE OF ENLIGHTENMENT:
EXPERIMENTAL EVIDENCE THAT THE
TRANSCENDENTAL MEDITATION TECHNIQUE PRODUCES A FOURTH
AND FIFTH STATE OF CONSCIOUSNESS IN THE INDIVIDUAL
AND A PROFOUND INFLUENCE OF ORDERLINESS IN SOCIETY

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Research completed August 1976

A review of scientific data shows that a fourth state of consciousness is reached through the Transcendental Meditation program. It is seen that repeated experience of this state develops a fifth state of consciousness, cosmic consciousness or enlightenment, in which behavior is spontaneously “in accord with all the laws of nature.” The enormous influence of orderliness that individuals growing toward enlightenment are now having on world consciousness provides evidence for the dawn of the Age of Enlightenment. —EDITORS

Recent experimental data on the fourth state of consciousness (transcendental consciousness) as produced by the Transcendental Meditation technique in advanced subjects, shows dramatic physiological changes in the same direction as the results of earlier experiments. Suspension of respiration, up to 60% reductions in oxygen consumption, autonomic stability and high long-range order in the EEG confirm the ground state model of transcendental consciousness as the state of least excitation of consciousness. Changes in plasma cortisol, prolactin and phenylalanine and urinary levels of serotonin fit this model and further distinguish transcendental consciousness from waking, dreaming, sleeping, or other forms of rest. EEG coherence is highest during the Transcendental Meditation technique (especially in the alpha and theta band frequencies), is most abundant in long term meditators and participants in advanced TM courses, and is strongly correlated with creativity, neurophysiological efficiency, and reported clarity of transcendental consciousness. High synchronization of the EEG correlated with pleasurable experiences during the Transcendental Meditation technique associates orderliness with the EEG with ability to experience satisfaction.

The fifth state of consciousness, “cosmic consciousness” or enlightenment, is seen as the maintenance of the physiological characteristics of transcendental consciousness along with waking, dreaming, and sleeping. Transcendental consciousness integrates the activity of waking, dreaming, and sleeping more completely into the processes of nature. This is seen in the waking state as greater awareness of contingencies of reinforcement, greater stability of an internal frame of reference in perceptual judgments, more rapid habituation of physiological systems, higher levels of moral reasoning, and greater adaptability and stability of physiological and psychological processes in general.

The subjective experiences of advanced participants in the TM program fall into definite categories, showing that the TM technique is a systematic and scientific means to develop subjective experiences of higher states of consciousness. There is also a close correspondence between the subjective experiences of advanced subjects and classical descriptions of higher states of consciousness from the Rig Veda.

The Maharishi Effect, the experimental evidence and the principle, that the most orderly individuals in society produce the greatest influence in society as a whole, shows that not only is the TM technique a practical means of effecting social change, but that we are now entering into an Age of Enlightenment.

INTRODUCTION

The Science of Creative Intelligence (SCI), founded by Maharishi Mahesh Yogi, contains a systematic description of seven major states of consciousness, of which waking, dreaming, and sleeping are the first three (52). Included within SCI is the knowledge of the theory, procedures, and experiences of attaining the four higher states of consciousness. SCI has opened up three areas of research: academic research on the integration of all disciplines in the light of SCI; scientific research on the development of higher states of consciousness; and applied
research on the extension of the knowledge of the growth of consciousness to the improvement of individual life and society.

According to Maharishi, the fourth state of consciousness is the source of thought which is reached through the Transcendental Meditation (TM) technique by the progressive refinement of mental activity (52). Maharishi has variously described the fourth state of consciousness as the “state of least excitation of consciousness,” “unbounded awareness,” “pure awareness,” “pure consciousness,” and “transcendental consciousness.” The fifth state of consciousness, “cosmic consciousness” or enlightenment, is attained through the repeated alternation of the Transcendental Meditation technique with ordinary activity and is a state in which transcendental consciousness is spontaneously maintained along with waking, dreaming, and sleeping.

The sixth and seventh states of consciousness are further developments in enlightenment resulting from a greater refinement of perceptual and cognitive processes.

As scientific research on the Transcendental Meditation technique has evolved, it has taken a direction towards more technically sophisticated experiments conducted on advanced participants in the TM program. This paper emphasizes the most recent experimental evidence of the existence of the fourth and fifth states of consciousness and reviews the previous research on the TM program in the light of these new data. All research is reviewed in the context of Maharishi’s descriptions of the evolution of enlightenment and its social implications and from the general point of view of the refinement of two opposite but complementary components of homeostasis, adaptability and stability.

Walter B. Cannon who developed the concept of homeostasis defined it as:

The coordinated physiological processes which maintain most of the steady states in the organism... a condition which may vary, but which is relatively constant... the fundamental condition of stability (17, p. 24).

Evolution toward a higher state of consciousness may be viewed as the process of not only maintaining homeostasis within the limits necessary for survival, but in addition to that, as progressively refining the internal conditions of the body until they are so finely tuned as to support a higher state of consciousness, enlightenment, the peak of human biological development. What the TM technique adds to the usual routine of biological rhythms is a new point of maximum stability and rest, truly the “fundamental condition of stability.” The state of least excitation of consciousness can be said to be the “ground state” of the physical nervous system, to use an analogy with quantum physics expressed by Domash (24).

Maharishi writes:

During Transcendental Meditation, the metabolism reaches its lowest point; so does the process of breathing, and the nervous system gains a state of restful alertness (51, p. 124).

Maharishi’s contention, supported by laboratory evidence, is that this deeper state is qualitatively, and not merely quantitatively, different from ordinary states either of wakefulness or rest.

**EVIDENCE OF A FOURTH STATE OF CONSCIOUSNESS**

**METABOLIC, CARDIOVASCULAR, RESPIRATORY, ELECTRODERMAL, AND BIOCHEMICAL DATA**—Wallace in 1970 was the first to experimentally study the possibilities of a fourth state of consciousness, and by measuring a variety of physiological parameters, he saw that the composite pattern of changes during the TM technique was different from that known to occur during waking, dreaming, and sleeping (88). Wallace’s research stimulated a great deal of work in this field and the evidence for a physiologically unique fourth state of consciousness as the ground state of the nervous system has been summarized in Table 1A.

As can be seen from Table 1A, metabolic processes, such as oxygen consumption, heart rate, and respiration rate, all decrease during the TM technique, and the sympathetic nervous system becomes less active and more

<table>
<thead>
<tr>
<th>TABLE 1A</th>
<th>METABOLIC, CARDIOVASCULAR, RESPIRATORY, ELECTRODERMAL, AND BIOCHEMICAL DATA</th>
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<tbody>
<tr>
<td>Oxygen consumption decreases more rapidly and to a greater extent during the TM technique than it does during sleep and hypnosis as reported in the literature (20, 88, 89, 90, 91) or during resting supine (23)</td>
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<td>Significant decreases are observed in heart rate during the TM technique (88)</td>
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<td>Decreased respiration rate has been observed during the TM technique (2, 3, 91)</td>
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<tr>
<td>Increases in basal skin resistance (indicating systematic relaxation) occur more rapidly and to a greater extent during the TM technique than during sleep, as reported in the literature (91). In addition, the changes in skin resistance are greater during the TM technique than during other relaxation procedures—uninstructed “meditation” (47), reading, listening to music, or eyes closed sitting (93)</td>
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<td>Decreased frequency of phasic skin resistance responses, a measure of autonomic stability, is found during the TM technique (64)</td>
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<td>Plasma cortisol, a major stress hormone, decreases significantly during the TM technique but not during eyes closed sitting or sleep, as reported in the literature (43)</td>
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<td>Plasma prolactin increases after the TM technique, but not after eyes closed sitting, and it is known to decrease after sleep (43)</td>
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<td>Plasma phenylalalanine increases during the TM technique in long-term meditators but doesn’t increase during eyes closed sitting (42)</td>
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<td>Serotonin levels (urinary levels of 5-hydroxyindole-3-acetic acid, the main serotonin metabolite) increase during the TM technique but not during eyes closed sitting (16)</td>
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stable as indicated by increased basal skin resistance, decreased frequency of phasic skin resistance responses and reduction in plasma cortisol, a major stress hormone. Biochemical changes in prolactin, phenylalanine, and serotonin metabolite are also different during the TM technique than during sleep or ordinary rest.

These changes suggest a minimization of metabolic activity. However, the most dramatic evidence that transcendental consciousness is the ground state of the nervous system comes from recent experiments on advanced participants in the TM program conducted at Maharishi European Research University (MERU) which show changes completely unlike those seen in other states of consciousness or produced by other procedures.

METABOLIC STUDIES CONDUCTED AT MERU—If the Transcendental Meditation technique produces the ground state of the nervous system, then the predicted properties of maximum stability and orderliness should be most evident during epochs of pure transcendental consciousness which occur periodically during the TM technique and which are seen most clearly in advanced meditators.

Farrow studied data collected during periods of subjectively reported clear experience of transcendental consciousness from several recording sessions on one long-term meditator (26). The subject signaled periods of “pure” transcendental consciousness by pressing a button immediately after the experience. The event marks made by the subject’s signals were found to have always occurred immediately after periods of suspension of respiration (see fig. 1). These periods of respiratory suspension lasted a mean of 18 seconds and a maximum of 35 seconds, and occurred about once every minute, giving a clear physiological indication of the onset and offset of a period of transcendental consciousness during which co-existent physiological changes could be studied. Periods of respiratory suspensions that were correlated with transcendental consciousness (category 1, without thoughts) were accompanied by a decrease in heart rate by approximately 10 beats per minute, cessation of phasic skin resistance responses, high and rising levels of basal skin resistance, and a generally high level of EEG coherence in all frequency bands, with particularly high and stable theta coherence throughout these periods.

EEG coherence patterns were highly similar in all regions of the brain measured, including frontal, central, temporal, parietal, and occipital derivations, indicating the global effects of transcendental consciousness on the

![Figure 1](image-url)
entire brain (26, p. 127). Total EEG power and EEG power in the delta and beta bands tended to be low during the periods of respiratory suspension and increased at the offset of the periods. Also occurring at the offset of the periods were an abrupt decrease in basal skin resistance, a burst of phasic skin resistance responses, and a sharp decrease in EEG coherence.

During the TM technique as a whole, Farrow found that oxygen consumption decreased a mean of 40%, and that minute ventilation decreased by a mean of 35%, whereas oxygen consumption decreased by a maximum of 60% towards the end of the TM technique. He also found that there was negligible compensatory breathing after the periods of respiratory suspension, much less than after holding the breath for similar periods of time. The mean rate of respiration during the periods when breathing did occur was 10.2 breaths per minute compared with 14.5 during the eyes closed precontrol period. The averaged respiration rate, which included periods of respiration and periods of respiratory suspension, was on the order of 5 to 6 breaths per minute. Farrow found, as did previous researchers, that the respiratory quotient remains constant during the TM technique, indicating that the levels of oxygen and carbon dioxide in the blood do not deviate from normal. This speaks for the naturalness of the process, that it doesn’t involve control or forcing of physiological processes.

The physiological changes that occur during respiratory suspension are what would be expected from a ground state model of transcendental consciousness: minimum metabolic activity, maximum stability, and maximum long-range spatial ordering in the brain. Furthermore, the physiological correlates of transcendental consciousness correspond to the subjective experience of orderliness, harmony, and silence.

According to the Science of Creative Intelligence, the reduction in metabolic processes observed during the TM technique parallels the progressive refinement of thoughts and reaches its lowest point when the finest level of thought is transcended and unbounded awareness is reached (52). As the subject in Farrow’s experiment described transcending:

> There is a very dramatic change as the state of transcendental consciousness begins. It is like skiing down a ski jump; at a certain point you leave the ski

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**FIG. 2. RESPIRATORY PATTERNS DEPICTING PERIODIC SUSPENSION OF ORDINARY BREATHING DURING THE TM TECHNIQUE IN ELEVEN DIFFERENT SUBJECTS.** Notice that there is no compensatory increase in respiration after periods of respiratory suspension. In subjects 8 and 9 respiration was extremely low for periods of more than a minute. Subject 11 was the subject in Farrow’s experiment. (Hebert, 1976)
jump and suddenly you are in the air. In transcending, you dive down and down, then "click," you find yourself in that other state, just "there" (26, p.114).

Hebert, in an independent study, reported the periodic cessation of breathing during the TM technique in ten subjects additional to Farrow's (37). These periods lasted from 10 to 45 seconds in duration with a mean of 12 suspensions occurring per subject (see fig.2). As in Farrow's study, the subjects exhibited little compensatory breathing after the breath stops, indicating no manipulation of the breathing process.

These data emphasize the cyclical nature of the physiological response to the Transcendental Meditation technique important for habituating the physical system to transcendental consciousness and thus giving rise to the fifth state of consciousness (52).

All of the physiological changes which distinguish transcendental consciousness from the non-transcendence periods during the TM technique (such as lower metabolic rate, greater autonomic stability, high levels of EEG coherence) are in a similar direction, but of greater magnitude, than the changes which distinguish the period of the Transcendental Meditation technique from non-meditation control periods. This suggests that the less dramatic changes reported in some experiments are in the direction of pure transcendental consciousness, and that some degree of transcendental consciousness is always reached by the subject.

ELECTROENCEPHALOGRAPHIC DATA—In addition to the metabolic data cited above, a number of studies of the EEG during the TM technique have distinguished it from other states of consciousness. These are summarized in Table 1B.

Banquet found that the spectral composition of the EEG during the TM technique is different from sleep stages, dreaming, or waking, with a preponderance of alpha and theta during the technique (6). He also found a higher index of wakefulness (alpha power divided by delta power) during the TM technique than during rest eyes closed or sleep. It should be noted that although it is natural to fall asleep during meditation if the person is fatigued, sleep is not transcendental consciousness, as Banquet clearly shows.

However, there may be some similarities between the EEG of the TM technique and the "junction point" between waking and sleep, waking and dreaming or between sleep and dreaming. Maharishi has pointed out that transcendental consciousness is the junction point between other states of consciousness, the ground state which the nervous system goes through as it shifts modes of functioning (52). Some investigators have shown the similarity of the EEG of the TM technique and the "junction point" (29), which, however, should not be confused with sleep proper. During the TM technique suspension in this state lasts for many minutes compared to a few seconds when one falls asleep. Also, the experience is clearer during the TM technique and becomes progressively more clear with repeated practice.

Longitudinal changes in the EEG suggestive of the neurophysiology of "clearer" meditations have in fact been observed. Vassiliadis measured the EEG power from the occipital region in novice participants in the TM program before instruction in the technique and six to nine months later (87). He found changes of increased alpha after the technique and increased theta during the technique, supporting Banquet's emphasis on the importance of these frequencies (5, 6).

The most interesting changes seen in the EEG during the TM technique, however, have been in those measures which reflect the degree of orderliness of the relationship of the EEG signals from different regions of the brain: effects on synchrony, correlation, and coherence. Banquet noticed an abundance of synchronous alpha spindles during the TM technique, as well as the occasional appearance of highly synchronous theta spindles and synchronous beta spindles (5). Others have found increased correlation in the amplitude and power of the EEG between the left and right hemispheres during the TM technique (94). Synchrony and coherence effects have become the most fruitful avenue of investigation of the EEG of the TM technique and are of particular theoretical interest because they imply increased orderliness in neurophysiological functioning.

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<thead>
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<tr>
<td>EXPERIMENTAL EVIDENCE OF A FOURTH STATE OF CONSCIOUSNESS: ELECTROENCEPHALOGRAPHIC DATA</td>
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<tr>
<td>— During the TM technique alpha EEG is extended from occipital to frontal regions indicating restful alertness as opposed to drowsiness (5, 91)</td>
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<td>— During the TM technique there is a preponderance of alpha and theta in the spectral power, whereas during sleep there is a preponderance of delta and during dreaming, a preponderance of beta (6)</td>
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<td>— There is a greater alpha activity during the TM technique than during eyes closed sitting in controls (46)</td>
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<tr>
<td>— An index of wakefulness (alpha power divided by delta power) is highest during the TM technique and lowest during sleep, reaching intermediate values during eyes closed sitting (6)</td>
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<td>— Synchronization of anterior and posterior channels is seen during the TM technique which does not occur during eyes closed sitting (5)</td>
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<td>— During the TM technique there is the unusual occurrence of synchronous beta (5) and theta spindles (5, 91)</td>
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<tr>
<td>— During the TM technique the alpha amplitude is more highly correlate between left and right hemispheres (frontal and parietal) than during eyes closed sitting or concentration (94)</td>
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<td>— During the TM technique there occur in the compressed spectr array (EEG power displayed over time) parallel peaks in the theta in alpha frequencies not seen in other states of consciousness (5)</td>
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<td>— A comparison of EEG measured before instruction in the TM technique and 6–9 months later shows longitudinal changes, an increase in the alpha after the period of the TM technique and more theta during and after the TM technique (87)</td>
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RECENT EEG STUDIES CONDUCTED AT MAHARISHI EUROPEAN RESEARCH UNIVERSITY—Unusual occurrence and morphology of EEG theta spindles. Hebert and Lehmann observed, in about one-third of over 90 advanced participants in the TM program tested, the occurrence of ultra synchronous high-amplitude theta spindles (100–300 µV) which were not associated with drowsiness and which were not observed in non-meditating subjects (38). These theta spindles appear out of a background of alpha activity, especially during, and occasionally outside the practice of the TM technique, which replicates earlier reports of this phenomenon by Wallace (88) and Banquet (5). As can be seen from fig. 3 these theta spindles occur simultaneously in all leads, are most prominent in the frontal areas, and exhibit a decreasing amplitude gradient from front to back.

In Hebert and Lehmann’s study the synchronous theta spindles seen during the TM technique were associated with the subjective experience of “pleasantness,” “floating sensations,” and “relaxation,” suggesting that during the TM technique motivational tensions are relaxed as the physiology settles into its “ground state.” Occurrence of high-amplitude theta has also been associated with pleasurable experiences in children, as well as rewards and satiation in animals, although previously it has rarely been observed in the normal adult population. In this context it can be mentioned that different parts of the hippocampal arch have shown a highly consistent phase pattern when the subjects (cats) approach the goal on successful trials, but that markedly different phase patterns were seen on incorrect trials (1).

FIG. 3. DISTRIBUTION AND MORPHOLOGY OF SYNCHRONOUS LARGE-AMPLITUDE THETA SPINDLES IN NORMAL ADULTS. Highly ordered theta spindles occur during the TM technique and show a decreasing amplitude gradient from anterior to posterior regions. (This figure was provided by J.R. Hebert, MERU, April 1976)

Thus synchronization of the EEG during the TM technique may reflect in adults the growing ability to experience satisfaction, and Hebert and Lehmann's experiment is important in linking EEG synchrony effects commonly seen in those practicing the TM technique with the experiences of increased fulfillment that they commonly report (13).

FIG. 4. COSPAR DURING SLEEP. This experiment monitored a non-meditator during a portion of the night’s sleep including both REM and non-REM stages. Note the absence of coherence peaks and low level of total coherence during Stage IV and the higher level of total coherence during REM sleep. The sleep spindles near 14 Hz are a characteristic feature of Stage II sleep.

Subject: Male, 19 years, nonmeditator
Reference electrode: Linked ears (Levine, 1975)

Thus synchronization of the EEG during the TM technique may reflect in adults the growing ability to experience satisfaction, and Hebert and Lehmann’s experiment is important in linking EEG synchrony effects commonly seen in those practicing the TM technique with the experiences of increased fulfillment that they commonly report (13).

EEG COHERENCE STUDIES AT MERU—The study of the EEG correlates of consciousness have been greatly facilitated by the development of new quantitative methods by Levine at the MERU laboratories (49). Intrigued by Domash’s speculation that there may arise superfluid or superconductive type effects in the nervous system associated with transcendental consciousness (24), Levine focused his work on the study of high global EEG coherence as the simplest pathway to uncover highly ordered new states in the brain and their possible relation to altered functioning on the cellular or even molecular
levels. Independently of any speculations, however, it became evident that the logical choice of EEG measures was the coherence spectrum which provides a measure of the correlation between two EEG channels for each frequency and attains a high value (i.e., near unity) at a given frequency if the phase relationship between the two channels is nearly constant over the time interval used to measure the coherence (49, p. 190).

Coherence in the EEG measured between two areas on the scalp represents a common mode of activity between two cortical areas, reflecting collective action among widely separated neurons (25). EEG coherence is particularly relevant to the concept of homeostasis or internal stability because homeostasis is a function of integrated, holistic bodily systems acting at many levels simultaneously, and coherence is a direct measure of brain integration. As was seen in Farrow’s study, coherence was highest during periods of the maximum physiological stability and quietude of transcendental consciousness.

To emphasize high EEG coherence, Levine devised the coherence spectral array or COSPAR technique of graphical representation of coherence history. The COSPAR, an adaptation of the compressed spectral array technique, displays coherence spectra for each successive epoch of time (usually selected at 5.12 seconds in Levine’s study), allowing a detailed analysis of moment by moment changes in coherence at each frequency. To emphasize high coherence which might occur with a change in the state of consciousness, Levine added two filtering features to the COSPAR; a threshold which displays coherence only in excess of a preselected value (typically set at .95); and a temporal continuity filter which displays a coherent event only if it persists for at least two successive intervals, thus eliminating sporadic events.

Figure 4 illustrates the usefulness of the COSPAR technique in distinguishing various states of consciousness. During sleep stages III and IV high coherence is virtually nil, with 14 Hz sleep spindles evident as coherent events.
FIG. 6. VARIETIES OF COHERENCE INCREASES SPECIFIC TO THE TM TECHNIQUE. This bilateral frontal COSPAR shows three different types of increases in coherence specific to the TM technique: (a) total coherence increases during the Transcendental Meditation technique; (b) alpha band coherence peaks appear with the start of the period of the technique; and (c) theta band coherence peaks (near 7 Hz) appear during the latter half of the period of the technique and vanish with the cessation of the technique.

Subject: Female, 44 years, four months practicing the TM technique
Reference electrode: Linked ears
(EO = Eyes open, EC = Eyes closed)
(Levine, 1975)

FIG. 7. ALPHA AND THETA COHERENCE DURING THE TRANSCENDENTAL MEDITATION TECHNIQUE. In the latter half of the period of the TM technique, strong coherence in the theta band near 6 Hz appears together with strong alpha band coherence near 9 Hz.

Subject: Female, 31 years, 62 months practicing the TM technique
Reference electrode: Linked ears
(EO = Eyes open, EC = Eyes closed)
(Levine, 1975)

during stage II sleep. More coherence was seen during dreaming than during deep sleep, especially in the lower frequencies (2–3 Hz) and in the total coherence values displayed to the right of the COSPARS (see fig. 4). These values are the average of coherence for all frequencies. It can be seen in figure 4 that total coherence, which is generally low and varies greatly during deep sleep, is consistently higher during dreaming. However, during dreaming there is virtually no high coherence in the higher EEG frequencies.

The results of 108 COSPARS generated from 35 experiments show increases in high coherence specific to the TM technique which are different from sleep or dreaming and which Levine (49) has classified into four types:

1. Coherence increase with onset of the TM technique, no decrease during eyes closed postcontrol.
2. Coherence increase with onset of the TM technique and decrease during eyes closed postcontrol.
3. Spreading of coherence peaks to other frequencies with the onset of the TM technique.
4. Other—various mixtures of effects of the onset and end of the TM technique.

Figure 5 shows the abrupt appearance of high coherence peaks in the alpha band coinciding with the onset of the TM technique and their disappearance with the end of the technique in a new meditator. It can also be seen in figure 5 that the effects of the TM technique on coherence were repeatable when measured on two different days. Note that on the second day there were also some high coherence peaks in the beta frequency (15 Hz), that total coherence was higher, often reaching near unity, and that high coherence tended to last more into the eyes closed
postcontrol period. The increase in coherence during the TM technique relative to the eyes closed precontrol period has been found to be highly statistically significant (35).

Figure 6 shows a variety of coherence effects seen in a single COSPAR of a four-month meditator. It can be seen that the total coherence increases during the TM technique, that alpha band peaks appear with the start of the technique, and that theta band coherence appears in the latter half of the period of the technique and disappears with its cessation. The appearance of theta coherence is associated with a deepening of meditation. Notice that the alpha band peaks continue during the eyes closed postcontrol period and somewhat into the eyes open postcontrol period, indicating the habituation of the system to maintain a coherent mode of functioning outside of the TM technique.

Figure 7 illustrates a further development in coherence, broader band alpha coherence peaks, often seen in experienced meditators, occurring in the pre- and postcontrol periods as well as during the TM technique, again illustrating habituation effects. Notice that towards the latter half of the period of the TM technique coherence peaks occur in the theta band together with strong alpha band coherence.

If high EEG coherence is indeed an effect of the TM technique on neurological functioning, then it would be most evident in the most experienced meditators, as has been found. Figure 8 shows the COSPAR of a long-term TM meditator. Large quantities of broad band coherence peaks were found within specific ranges of the theta, alpha, and beta frequencies throughout the experimental period. During the eyes open precontrol period high coherence peaks were seen in the beta frequencies (at 16–18 Hz). When the eyes were closed, strong coherence also appeared in the alpha range. Abruptly at the onset of the TM technique, strong coherence appeared in the theta range (near 6 Hz) as well. After the cessation of meditation, strong theta, alpha, and beta coherence continued, and in the post TM eyes open period, coherence peaks persisted in the alpha, beta, and lower frequencies (near 2 Hz). Note that the total coherence value for this advanced meditator was near unity throughout the period of the experiment.

From these data taken together it appears that the TM technique produces increased EEG coherence, the spread of high coherence to a wider range of the EEG spectrum, and, with repeated practice of the technique, the eventual maintenance of high coherence during the waking state, eyes open or eyes closed. This conclusion is strongly supported by recent experiments at MERU on graduates of advanced six-month courses in Switzerland (Age of Enlightenment Governor Training Courses) which Maharishi has developed to accelerate the growth of consciousness. These subjects frequently report experiences of the stabilization of transcendental consciousness to the point where it is maintained along with the waking, dreaming, and sleeping states. And the COSPARS of these subjects typically show high levels of coherence occurring over a broad band of the EEG spectrum (fig. 9).

**FIG. 8. COSPAR OF A LONG-TERM MEDITATOR.** In the most experienced subject studied, the highest levels of coherence were found. Note how during the period of the Transcendental Meditation technique the coherence peaks extend over a major portion of the 0–25 Hz band. The strong beta coherence—possibly harmonically related to the alpha/theta activity—is particularly unusual. Strong theta coherence near 6 Hz begins abruptly with the start of the period of the technique.

Subject: Female, 26 years, 15 years practicing the TM technique
Reference electrode: Linked ears (EO=Eyes open, EC=Eyes closed) (Levine, 1975)
FIG. 9. HIGH-LEVEL, WIDE-BAND EEG COHERENCE—A FEATURE OF BRAIN WAVE ACTIVITY DURING THE TM TECHNIQUE IN AN ADVANCED PARTICIPANT IN THE TM PROGRAM REPORTING FREQUENT EXPERIENCES THAT INDICATE STABILIZATION OF THE STATE OF ENLIGHTENMENT. This COSPAR was computed using a 40 second epoch (instead of 5.12 sec. as in figs. 4–8) which gives a more stable estimate of coherence. The threshold was adjusted to .8 to make this COSPAR comparable to those in previous figures. (Hebert and Haynes, Private Communication, April 1976)

FIG. 10. CORRELATIONS AMONG EEG COHERENCE, CREATIVITY, H-REFLEX RECOVERY, AND CLARITY OF THE EXPERIENCE OF TRANSCENDENTAL CONSCIOUSNESS. Significant positive correlations were found between all pairs of variables, suggesting that the growth of consciousness is an integrated development of many systems. (Haynes, Hebert, Reber and Orme-Johnson, 1976)

The results indicate that the clear experience of transcendental consciousness is likely to be accompanied by (a) high EEG coherence, (b) high levels of creativity, and (c) rapid motor neuron recovery.

The difference in the level of coherence in high and low creativity subjects is quite distinct, as can be seen from the COSPARS in figure 11. The three subjects who performed best on the creativity test showed an abundance of high coherence, especially in the alpha range, whereas much less coherence is seen in the three subjects who scored the lowest. In this experiment, greater clarity of transcendental consciousness and greater coherence during meditation were associated with greater creativity during waking activity. These data support Maharishi’s assertion that the stabilization of transcendental consciousness along with activity gives rise to more powerful, successful, and creative thought, characteristic of enlightenment (52).

A COHERENCE CONTINUUM OF FOUR STATES OF CONSCIOUSNESS—The data on EEG coherence show that during sleep coherence is nil, whereas it increases during dreaming, is even higher during waking, and reaches its highest point during the TM technique. This suggests the existence of a consciousness-coherence continuum, with sleep occupying the low end, followed by dreaming, waking, and transcendental consciousness (see fig. 12). All of the existing EEG coherence data fit nicely into this scheme which proposes a single EEG parameter on which the first four states of consciousness can be represented. Parallel to the coherence dimension is an awareness dimension that includes the lack of awareness of sleep, the illusory awareness of dreaming, awareness of thoughts and perceptions in the waking state, and pure awareness of the experiencer experiencing himself in the state of transcendental consciousness.

It is suggested in fig. 12 that sleep and dreaming function as preparation for more effective waking state activity. Waking activity is thought to be directed toward fulfillment of desires. It is well known that when a desire is fulfilled the EEG becomes more synchronized (post-reinforcement EEG synchronization after positive reinforcement or avoidance, discussed by Hebert and Lehmann, 38). This suggests that the result or “goal” of fulfilling desires is physiological (and psychological)
COHERENCE OF THE THREE SUBJECTS
WITH HIGHEST CREATIVITY SCORES AMONG THOSE TESTED

A

B

C

D

E

F

FIG. 11. PORTIONS OF COHERENCE SPECTRAL ARRAYS (COSPARS) FOR THE THREE SUBJECTS WITH THE HIGHEST AND THE THREE SUBJECTS WITH THE LOWEST CREATIVITY SCORES AMONG 33 SUBJECTS TESTED. High creativity was associated with high EEG coherence particularly evident in the 8 to 10 Hz frequency band. The COSPARS are for bilateral frontal (F3, F4) derivations during the TM technique. (Haynes, Hebert, Reber and Orme-Johnson, 1976)

integration. The state of maximum integration in transcendental consciousness must be the ultimate goal of all waking state activity, and of sleep and dreaming as well, since they support the waking state. Our suggestion is that all the activity of the first three states of consciousness is directed toward attaining the fourth state. The Transcendental Meditation technique is the direct means of achieving transcendental consciousness through which the fifth, sixth, and seventh major states of consciousness can be developed (52).

The representation of the first four states of consciousness on a continuum suggests that the fourth state of consciousness occupies a unique position as the “absolute zero point” of consciousness from which all states can be derived (52). It is a law of physics and perhaps of nature generally that the state of least excitation of a system represents a unique condition fundamental to all the more active states (24).

It would be a mistake to think of the fourth state of consciousness only as a condition of extraordinary relaxation; both according to traditional Vedic philosophy and according to Maharishi pure consciousness is a type of very basic knowledge (52). This idea is parallel to the Reconstruction Theorem of quantum physics that states that “an entire theory of nature can be recovered from complete knowledge of the vacuum state only” (24, p. 663) which is similar to Maharishi’s contention that transcendental consciousness is the home of all the laws of nature. In fact, Domash has suggested that the human nervous system may actually be “a macroscopic device sensitive to its microscopic internal state” able to directly experience the vacuum state during transcendental consciousness (24, p. 663). If this is true, then pure consciousness is quite literally the “home of all the laws of nature.”

This connection between transcendental consciousness and the vacuum state is supported by striking parallels
### CONTINUUM OF FOUR MAJOR STATES OF CONSCIOUSNESS

<table>
<thead>
<tr>
<th>STATE OF CONSCIOUSNESS</th>
<th>Sleep</th>
<th>Dreaming</th>
<th>Waking</th>
<th>Transcendental Consciousness</th>
</tr>
</thead>
<tbody>
<tr>
<td>EEG COHERENCE DIMENSION</td>
<td>nil</td>
<td>low</td>
<td>intermediate</td>
<td>high</td>
</tr>
<tr>
<td>AWARENESS DIMENSION</td>
<td>no awareness</td>
<td>illusory awareness</td>
<td>awareness of perceptions, thoughts</td>
<td>pure awareness</td>
</tr>
<tr>
<td>FUNCTION</td>
<td>normalization of physiological fatigue</td>
<td>normalization of psychological tension (unsatisfied desire)</td>
<td>motivated activity for the fulfillment of desires</td>
<td>maximum physiological and psychological integration, state of fulfillment</td>
</tr>
</tbody>
</table>

**FIG. 12. THE FIRST FOUR STATES OF CONSCIOUSNESS ON A CONTINUUM OF TWO PARALLEL DIMENSIONS, AWARENESS AND COHERENCE.** In this representation, EEG coherence is conceived of as a continuum parallel to awareness, with higher levels of awareness associated with higher degrees of brain integration. It is suggested that the functions of sleep and dreaming are preparation for waking activity, and that the ultimate goal of all waking activity is the experience and stabilization of transcendental consciousness, the state of maximum physiological and psychological integration.

between the subjective experience of pure consciousness, the properties of the vacuum state, and the measured effects of pure consciousness on the physiology. Each is characterized by orderliness, stability, non-change, the source of change, and unboundedness (54). Although the concepts non-change, the source of change, and unboundedness are not ordinarily used in the context of measurement, which is concerned with boundaries and change, the suspension of respiration and uniform ordered effect of the EEG across the brain can be described in this way.

In the following section we will see that from the point of view of the survival and success of the individual, that as he rises toward enlightenment, he does become more in accord with the laws of nature, as can be seen from the enhancement of the fundamental processes of adaptability and stability.

**EXPERIMENTAL EVIDENCE OF A FIFTH STATE OF CONSCIOUSNESS—ENLIGHTENMENT**

Experimental scientists interested in studying the state of enlightenment have found it profitable to become familiar with Maharishi's descriptions of the evolution of cosmic consciousness, such as in the following excerpt from his commentary on the *Bhagavad-Gita*:

Now, for transcendental consciousness to become permanent and to co-exist with the waking state of consciousness, it is necessary that the two states of the nervous system corresponding to these two states of consciousness should co-exist. This is brought about by the mind gaining alternately transcendental consciousness and the waking state of consciousness, passing from one to the other. This gradual and systematic culture of the physical nervous system creates a physiological situation in which the two states of consciousness exist together simultaneously. It is well known that there exist in the nervous system many autonomous levels of function, between which a system of coordination also exists. In the state of cosmic consciousness, two different levels of organization in the nervous system function simultaneously while maintaining their separate identities. By virtue of this anatomical separation of function, it becomes possible for transcendental consciousness to co-exist with the waking state of consciousness and with the dreaming and sleeping states of consciousness.

In the early stages of the practice of Transcendental Meditation, these two levels of function in the nervous system are unable to occur at the same time; the function of the one inhibits the function of the other. That is why, at this stage, either transcendental consciousness or the waking state of consciousness is experienced. The practice of the mind in passing from one to another gradually overcomes this physiological inhibition, and the two levels begin to function perfectly at the same time, without inhibiting each other and still maintaining their separate identities. The function of each is independent of the other, and that is why this state of the nervous system corresponds to cosmic consciousness, in which self-awareness exists as separate from activity. Silence is experienced with activity and yet as separate from it (51, p. 314).

Maharishi's description of distinct levels of the nervous system that simultaneously function in the fifth state of consciousness, one maintaining the physiology of the
waking state and the other maintaining the physiology of transcendental consciousness, is consistent with the basic principle of anatomical separation of function of the nervous system. His description of the mutual inhibition of two levels of functioning which is later overcome as the fifth state of consciousness develops gives a model for interpreting the experimental data.

For example, we have already seen that aspects of waking physiology, such as respiration, autonomic activity (phasic skin resistance responses) and cortisol production, are inhibited during transcendental consciousness (26, 43, 64). The burst of electrodermal activity, abrupt resumption of respiration, and sudden rise in EEG delta and beta power coinciding with the end of a period of transcendental consciousness can be interpreted as the sudden disinhibition of these aspects of waking state physiology (26).

An example of the inhibition of the physiology of transcendental consciousness by the onset of waking state physiology is the sudden decrease in EEG coherence in the alpha and theta bands at the end of a period of transcendental consciousness (26) and at the end of the period of the TM technique (49).

The occurrence of high EEG alpha and theta coherence often seen immediately after the TM technique together with ordinary levels of respiration and metabolic activity is an example of a mixed state of waking physiology and the physiology of transcendental consciousness maintained simultaneously. As a general principle, we would expect that as enlightenment develops, the characteristics of the fourth state of consciousness would be maintained along with waking, dreaming, and sleeping.

Changes during the sleep state—Banquet has studied sleep occurring during the TM technique in long-term TM meditators who reported that they experienced preserved awareness during sleep (6). Their EEG during these periods shows the simultaneous occurrence of waxing and waning of slow waves (1 Hz or less) indicative of deep sleep, together with alpha spindle activity, indicative of awareness. In studies of night sleep in TM meditators, Banquet found one subject who could consistently signal with a pushbutton the occurrence of K complexes and delta trains of stage III sleep, suggesting that the subject was spontaneously maintaining awareness during sleep. It is possible, however, that Banquet’s subject was maintaining waking state awareness rather than transcendental consciousness during sleep. Whereas some level of awareness can be observed in nonmeditator subjects during hypnagogic phases or morning dreams, in long-term TM meditators awareness apparently extends to deeper phases of sleep and even to the entire period of sleep (6).

Greater adaptability of TM meditators with respect to sleep is seen in the ability of insomniacs to fall asleep sooner, indicating an increased ability to change states of consciousness (57, 60). This is also shown in Banquet’s study by a shorter transition time from alpha to large amplitude delta periods of deep sleep (6).

Banquet also found that the total duration of night sleep tended to be shorter in long-term TM meditators, lasting three to four hours in the extreme (6), which may be an indication that sleep is becoming more efficient, or that the waking state is more efficient and less sleep is needed.

Changes during the dreaming state—There is as yet little experimental evidence of increased inner awareness during dreaming, although advanced TM meditators often report “witnessing” their dreams. Banquet has reported shorter, more pleasant, and less frequent dreaming in long-term TM meditators (6). Others have found less compensatory REM on recovery nights after a period of 40 hours sleep deprivation in TM meditators (58). This shows less of a stress response to the deprivation of sleep.

Physiological changes during the waking state—Evidence of the development of a fifth state of consciousness during the waking state is first seen in the laboratory as the tendency of TM meditators to go into transcendental consciousness while they are sitting with eyes closed even though not practicing the TM technique, and later as the development of the characteristics of transcendental consciousness while awake with eyes open, as was seen in the EEG coherence data. Wallace (88) was the first to find that during the eyes closed precontrol period, subjects sometimes “slipped into meditation” (as they reported after the experiment). These “slips” were characterized by large rises in skin resistance characteristic of the TM technique proper.

Table 2A summarizes changes in physiological stability in the waking state which are parallel to the changes seen during transcendental consciousness summarized in Tables 1A and 1B. For example, during the waking state either before or after practicing the TM technique, TM meditators have been observed to have lower respiration and heart rates, greater autonomic stability, more synchronous and coherent EEG, less of the stress hormone cortisol, and higher levels of serotonin metabolite than control subjects, all of which are changes characteristic of transcendental consciousness.

Clearly, there is substantial evidence of the development of a mixture of the physiology of transcendental consciousness with waking, dreaming, and sleep in participants in the TM program. The question arises as to what influence transcendental consciousness has on other states when it is maintained simultaneously with them. We have already seen evidence that sleep and dreaming become more efficient, and in general, it appears that transcendental consciousness enhances the integration of other states.
Maharishi has explained that the nervous system becomes more flexible and efficient as it alternates through the extreme range many times, it becomes more adaptable. The experimental evidence of increased adaptability of the waking state physiology in TM meditators is presented in Table 2B. The results show a wide range of effects, such as rapid habituation, enhanced performance in athletes, faster recovery after exercise, greater ability to perform complex perceptual-motor tasks, sharper perceptual abilities, and more rapid recovery from a variety of physiological abnormalities such as hypertension, over-weight, bronchial asthma, and stuttering.

Although the presence of inner awareness or “witnessing” is reported to occur during the waking state in advanced meditators, it appears to be less distinct an experience than witnessing sleep and dreaming. However, the growth of an internal stability factor during the waking state can be inferred from a number of different psychological measures.

Psychologists have long recognized that “internal stability” is a key factor in determining perceptual style, learning, personality, and social behavior, as Pelletier has pointed out (68).

Witkin’s field independence—field dependence dimension is perhaps the most thoroughly researched example of this concept. The name field independence means independence from distracting influences from the surrounding “field” on one’s focus, implying inner stability. The results of several years of study by Witkin and his coworkers show that “field independent” persons have a stable internal frame of reference from which they interpret and react to the world. These individuals possess a stable view of themselves which is independent of their social context; they are more “self directing” and need less guidance from others. They have stabler attitudes, social context; they are more

<table>
<thead>
<tr>
<th>TABLE 2A</th>
<th>TABLE 2B</th>
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<tbody>
<tr>
<td><strong>EXPERIMENTAL EVIDENCE OF THE GROWTH OF A FIFTH STATE OF CONSCIOUSNESS IN PARTICIPANTS IN THE TRANSCENDENTAL MEDITATION PROGRAM: PHYSIOLOGICAL STABILITY</strong></td>
<td><strong>EXPERIMENTAL EVIDENCE OF THE GROWTH OF A FIFTH STATE OF CONSCIOUSNESS: PHYSIOLOGICAL ADAPTABILITY</strong></td>
</tr>
<tr>
<td>—Lower levels of respiration and heart rate have been seen in TM meditators outside the period of the TM technique than in controls (73, 95)</td>
<td>—Skin resistance responses to stressful auditory stimuli habituate more rapidly in TM meditators than in controls (9, 64, 82, 95)</td>
</tr>
<tr>
<td>—Fewer phasic skin resistance responses (a measure of autonomic stability) are found in TM meditators relative to controls (64, 95) and longitudinal increases in stability have been measured in TM meditators (9, 65)</td>
<td>—EEG alpha induction and alpha blocking to photic stimuli (two indices of attention) are greater in TM meditators, eyes closed sitting, than in controls, eyes closed sitting, suggesting enhanced neurological alertness (96)</td>
</tr>
<tr>
<td>—Levels of plasma cortisol are lower in long-term TM meditators outside of practice of the TM technique than in controls (43)</td>
<td>—Shorter reaction time has been reported after the TM technique relative to resting supine (66)</td>
</tr>
<tr>
<td>—Biochemical effects (increased phenylalanine) are seen in long-term TM meditators which are not seen in new TM meditators (42)</td>
<td>—Performance of complex perceptual-motor tasks is enhanced in TM meditators (11, 72)</td>
</tr>
<tr>
<td>—Higher levels of the serotonin metabolite are seen in TM meditators outside of meditation than in controls (16)</td>
<td>—Temporal discrimination of auditory stimuli is improved after the TM technique relative to eyes closed sitting (70)</td>
</tr>
<tr>
<td>—TM meditators display the unusual ability to maintain alpha activity (abundant during the TM technique) after the end of the technique with eyes open (5, 46)</td>
<td>—Agility and performance are increased in athletes practicing the TM technique relative to controls (71)</td>
</tr>
<tr>
<td>—Power in the left and right cerebral hemispheres of TM meditators remains equalized in the postcontrol eyes open period (94)</td>
<td>—Increased cardiovascular and respiratory efficiency have been seen in athletes practicing the TM technique relative to controls (71)</td>
</tr>
<tr>
<td>—More highly correlated EEG between left and right hemispheres (frontal and parietal) is seen in TM meditators after practice of the TM technique than in controls (94)</td>
<td>—Increased hemoglobin concentration (indicating increased oxygen carrying capacity of the blood) has been seen in athletes practicing the TM technique relative to controls (71)</td>
</tr>
<tr>
<td>—High coherence associated with the TM technique lasts into the postcontrol eyes closed period and sometimes is found in the precontrol period (49)</td>
<td>—Faster recovery of peripherally measured temperature homeostasis after exercise has been seen in TM meditators relative to controls (55)</td>
</tr>
<tr>
<td>—High coherence is seen during the pre- and postcontrol eyes open periods in long-term TM meditators (49)</td>
<td>—Decreased blood pressure has been observed in hypertensive patients practicing the TM technique (7, 10, 81)</td>
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</tbody>
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<tbody>
<tr>
<td>—Increased duration of exercise, increased maximum work load, delay in onset of ST depression (an electrocardiographic measurement), and lower double product (an indirect measure of oxygen consumption of the heart) were seen in a study of heart patients (angina pectoris) who learned the TM technique compared to control subjects who did not change significantly (99)</td>
<td>—Increased duration of exercise, increased maximum work load, delay in onset of ST depression (an electrocardiographic measurement), and lower double product (an indirect measure of oxygen consumption of the heart) were seen in a study of heart patients (angina pectoris) who learned the TM technique compared to control subjects who did not change significantly (99)</td>
</tr>
<tr>
<td>—Improvement in symptoms of bronchial asthma and reduced airway resistance have been reported in TM meditators relative to controls (20, 40, 97)</td>
<td>—Increased hemoglobin concentration (indicating increased oxygen carrying capacity of the blood) has been seen in athletes practicing the TM technique relative to controls (71)</td>
</tr>
<tr>
<td>—Reduction in stuttering (56) and normalization of weight (92) indicate recovery of normal adaptive functions in TM meditators</td>
<td>—Faster recovery of peripherally measured temperature homeostasis after exercise has been seen in TM meditators relative to controls (55)</td>
</tr>
<tr>
<td>—Less time is needed to fall asleep in persons with chronic insomnia who begin the practice of the TM technique (57, 60)</td>
<td>—Decreased blood pressure has been observed in hypertensive patients practicing the TM technique (7, 10, 81)</td>
</tr>
</tbody>
</table>

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TABLE 2C

<table>
<thead>
<tr>
<th>EXPERIMENTAL EVIDENCE OF THE GROWTH OF A FIFTH STATE OF CONSCIOUSNESS: PSYCHOLOGICAL STABILITY</th>
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</thead>
<tbody>
<tr>
<td>Decreased susceptibility of visual perception (vertical orientation and pattern recognition) to the effects of experimentally manipulated distracting stimuli (Rod-and-Frame Test and Embedded Figures Test) suggests increased stability of an internal frame of reference in TM meditators relative to controls (67, 68).</td>
</tr>
<tr>
<td>Increased internal locus of control found in TM meditators (Rotter's Internal/External Locus of Control Scale) indicates the enhancement of awareness of contingencies of reinforcement, awareness of the consequences of one's behavior on the environment and on one's self, leading to more stable learning and performance (39).</td>
</tr>
<tr>
<td>Inner-Directedness (a major scale of the Personal Orientation Inventory), measuring independence and self-supportiveness, increases in those practicing the TM technique compared with control groups (62, 76).</td>
</tr>
<tr>
<td>Decreased neuroticism and decreased anxiety are reported in TM meditators in a number of personality studies (22, 27, 28, 30, 39, 63, 69, 83, 84, 85).</td>
</tr>
<tr>
<td>Increased stability of psychiatric outpatients practicing the TM technique has been observed by the treating physician (12).</td>
</tr>
<tr>
<td>Increased stability in hospitalized psychiatric patients practicing the TM technique relative to a control group has been shown by greater recovery at the time of hospital discharge (33).</td>
</tr>
<tr>
<td>Increased stability in patients practicing the TM technique relative to control groups in drug rehabilitation clinics assessed by psychological tests as well as by reduced usage of illegal drugs has been measured longitudinally (15, 74).</td>
</tr>
<tr>
<td>Reduced anxiety in prisoners practicing the TM technique has been measured by psychological inventories (4, 21) and by autonomic stability (reduced phasic skin resistance responses) (65).</td>
</tr>
<tr>
<td>A study of case histories has reported reduced anxiety, reduced drug usage, and more stable social behavior in juvenile offenders practicing the TM technique, as measured by psychological tests, self-rating, and parental rating (18).</td>
</tr>
<tr>
<td>Greater stability of the work environment as assessed by improved interpersonal relations between supervisors and employees and greater job stability have been observed in TM meditators relative to controls (31, 32).</td>
</tr>
</tbody>
</table>

Table 2C summarizes the experimental evidence of the growth of a fifth state of consciousness, highlighting psychological stability in various domains.

TABLE 2D

<table>
<thead>
<tr>
<th>EXPERIMENTAL EVIDENCE OF THE GROWTH OF A FIFTH STATE OF CONSCIOUSNESS: PSYCHOLOGICAL ADAPTABILITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-actualization increases in TM meditators, as inferred from holistic changes on a variety of personality scales that reflect greater awareness of oneself and of others, increased flexibility, and more spontaneity (Personal Orientation Inventory, 62, 76; Northridge Developmental Scale, 30, 79; Personality Research Form, 75; Self-Actualization Inventory, 86).</td>
</tr>
<tr>
<td>General fluid intelligence, the capacity to learn and to perceive complex relationships and to respond adaptively and effectively to new situations, has been reported to increase in TM meditators relative to controls (Differential Aptitude Test, Dutch adaptation, 84, 85; Raven's Progressive Matrices, 80).</td>
</tr>
<tr>
<td>The increased ability of TM meditators to think abstractly has been measured longitudinally by &quot;secondary organization,&quot; the tendency to cluster random events into conceptual categories (59).</td>
</tr>
<tr>
<td>Acceleration of academic achievement (measured by grades) in university students (19, 36) and in secondary school students (45) practicing the TM technique has been observed.</td>
</tr>
<tr>
<td>Greater creativity, more originality, flexibility, and fluency of verbal thinking (Torrance Test of Creative Thinking) have been measured in TM meditators (50).</td>
</tr>
<tr>
<td>A higher level of moral reasoning (Kohlberg's stages) has been reported in TM meditators relative to a control group (61).</td>
</tr>
</tbody>
</table>

Table 2D outlines the experimental evidence of the growth of a fifth state of consciousness, focusing on psychological adaptability in various aspects.

The stabilization of transcendental consciousness is the development of increased self awareness in its most profound sense, the awareness that one's essential nature is pure consciousness (52). As this experience grows it is not surprising to find that a sense of self worth increases, as well as the ability to live in the present (39, 62, 76). Table 2D shows a number of changes in psychological adaptability that arise along with the stabilization of transcendental consciousness: increased self-actualization, increased general fluid intelligence, improved ability for abstract categorization and memory, accelerated academic performance, greater creativity, and a higher level of moral reasoning. If these changes are found in beginning TM meditators, it is obvious that enlightenment must be a state of enhanced mental abilities.

SOCIOCOLOGICAL IMPLICATIONS OF A FIFTH STATE OF CONSCIOUSNESS

So far we have considered the experimental evidence of a fourth and fifth state of consciousness and the changes they produce in the individual. The question naturally arises as to the impact of such changes on social behavior. Experiments measuring social behavior and attitudes have documented improved interpersonal relations (31, 32), increased tolerance and respect for others (27, 28, 80), a more positive view of humanity, and more concern for man and for the environment (increased self-actualizing values: 39, 62, 76).

Most impressive, however, is the impact of the Transcendental Meditation program on the area of social rehabilitation. Studies of prisoners and juvenile offenders have shown positive changes in personality (18, 65), reduced anxiety (4, 18, 21), more participation in positive activities (4, 18), and fewer violations of prison rules (4). Numerous others have documented the decline in polydrug use in students, juvenile offenders, and drug abuse patients (8, 15, 18, 44, 48, 74, 77, 78). Psychiatrist Bernard Glueck has found that hospitalized psychiatric patients from a variety of diagnostic categories who received the TM program along with regular hospital treatment were significantly more improved at the time of hospital discharge than a matched comparison group (33). The usefulness of the TM technique for the treatment of psychotic outpatients suffering from anxiety neurosis,
obsessive-compulsive neurosis, depression, drug use, and psychosomatic disease has been shown by psychiatric case reports (12).

The TM program has a beneficial effect on the social behavior of those who practice it, on those around them, and this effect stretches beyond to the entire community. Clearly a new state of consciousness is not only implied for individuals but for society as a whole. This is most dramatically shown in the improvement in the quality of life in cities when one percent or more of their population is practicing the TM technique.

THE MAHARISHI EFFECT—A study of all possible, initial crime rate (14). Crime rate in each city decreased, reminiscent of phase transition or thresholding crime rate in control cities matched for resident population, geographic region, college population and when possible, initial crime rate (14). Crime rate in each city was found to show a steady yearly increase, as it did throughout the U.S., until the year the number of TM meditators reached one percent, whereupon it suddenly was found to show a steady yearly increase, as it did throughout the U.S., until the year the number of TM meditators reached one percent, whereupon it suddenly decreased, reminiscent of phase transition or threshold effects common in physics and biology. This phenomenon has been named the “Maharishi Effect.”

The authors of this study point out that similar phenomena of more orderly elements in a population creating an influence of order in the entire population are quite common. It is a general principle in physics that in wavelike interactions the combined interaction of coherent elements adds up to a much more powerful influence than the combined interaction of incoherent elements. The same principle is found to operate in developmental biology. The developmental fate of an organism is determined by the influence of a few cells (the Primary Organizer), which do not merely replicate themselves but rather orchestrate the coordinated specialization of all the tissues, organs, limbs, etc. The authors suggest that in a city as well, a relatively small proportion of more orderly individuals, approximately one percent TM meditators for cities in the 25,000 to 50,000 population range, will have an orderly effect on the entire city, and that for larger cities and countries less than one percent may be needed. This is to imply that there is a fundamental and simple law of social dynamics by which the Maharishi Effect can be understood.

In 1974, the population of the San Francisco Bay area participating in the TM program reached one percent and San Francisco became the only major city in the U.S. that year in which crime rate did not increase dramatically. Furthermore, beginning in 1969 thousands of people in the San Francisco Bay area began the TM technique and that year the rising trends of serious crime, deaths, and hospital admissions began to decline, and have continued to decline since. Other cities like Cleveland and Detroit have experienced a decline in crime rate in suburbs or sections with one percent or more TM meditators after local teachers of the TM technique predicted that this would occur. As of late summer 1976 with over 600 towns and cities in the U.S. with one to seven percent TM meditators the country as a whole is obviously on the threshold of a phase transition to a better quality of life.

THE CORRESPONDENCE OF THE SUBJECTIVE EXPERIENCES OF PARTICIPANTS IN THE TM PROGRAM WITH CLASSICAL DESCRIPTIONS OF HIGHER STATES OF CONSCIOUSNESS FOUND IN ANCIENT LITERATURE—In our analysis of enlightenment we have emphasized the objective and physiological side. It is equally important to recognize that growth toward the threshold of enlightenment is also an area of very beautiful subjective experience. Unlike other forms of subjective experience, experience of the growth of enlightenment is systematically and scientifically developed. Different individuals practicing the TM technique are likely to have experiences which may be classified into certain definite categories, suggesting that the nervous system at this subtle level operates in a very definite way which can be subjected to scientific investigation.

Advanced courses in the TM program have given rise to many such experiences in the last year and a major study of 17,000 experiences is underway at MERU and will be published elsewhere. Here we would like to quote a few examples with the purpose of demonstrating that these experiences correspond closely to descriptions in the ancient records of developed consciousness, and that the state of enlightenment that the TM technique brings is the same state that is described by Vedic rishis (see Table 3). It is likely that experiences like these have not been developed in so many people for a number of centuries. The fact that these experiences fall together in definite categories and that they correspond to the classical descriptions of enlightenment shows that the TM program is a systematic, scientific, and effective way to develop subjective experience of higher states of consciousness.

GOVERNORS OF THE AGE OF ENLIGHTENMENT—Maharishi has designed the advanced courses referred to earlier in order to accelerate the growth of consciousness. The Age of Enlightenment Governor Training Courses consist of six to twelve months of continuous deep experience of the TM technique in a carefully controlled environment together with the use of certain advanced ancillary practices. These courses have provided the most advanced subjects for MERU’s psychophysiological studies, subjects in whom respiratory suspension (fig. 2) and high broad band EEG coherence (fig. 9) have been observed. These individuals have also provided the large library of
subjective experiences which correspond to experiences described in the Vedas, thus linking modern psychophysiology with man’s most ancient records of the knowledge of consciousness.

As we have seen, an enlightened person is one who spontaneously maintains transcendental consciousness throughout the cycles of waking, dreaming and sleep. In one who functions on this level of consciousness, according to Maharishi, thinking and intuition are more closely integrated into the processes of nature generally (52). Therefore his activity is more likely to be successful. This statement can be verified by the greater stability and adaptability reported in the scientific literature. Developing a nervous system capable of continuous profound experiences of the subtlest levels of consciousness, and learning to operate there in an effortless but specific fashion give rise to greater intuition and powerful thinking that, according to Maharishi, attract the cooperation of nature for the fulfillment of desires (52).

These individuals can be said to be in “accord with all the laws of nature” (52), that is, they possess a nervous system at such a level of development that it is a perfect transducer of all impinging sensory information which it integrates from a basis of pure awareness, and, consequently, behavior is spontaneously in harmony with nature. As a result of heightened alertness and perception, the individual is in lively attunement with the environment, and his actions are free from mistakes.

Being by far the most highly ordered and coherent elements in nature, enlightened persons can be expected to exert an enormous influence of harmony on the environment. If a small fraction of novice meditators spending 15 to 20 minutes twice a day experiencing transcendental consciousness can measurably increase orderliness and improve the quality of life in the whole community, then enlightened individuals who have stabilized transcendental consciousness 24 hours a day could

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TABLE 3

<table>
<thead>
<tr>
<th>TEXT</th>
<th>EXPERIENCE</th>
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<tbody>
<tr>
<td>1. Experience pertaining to transcendental consciousness</td>
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</tbody>
</table>
*Rig Veda.* 9.1.1
“In sweetest and most gladdest streams flow pure, O Soma, on thy way.”
| “During meditation I have experienced the flow of pure consciousness as having a heavenly, sublime sweetness which is usually experienced by all of my senses simultaneously.” |
| *Rig Veda.* 9.17.8
“Pour forth the stream of the sweet beverage. . . .” |
| 2. Experiences of transcendental consciousness dissolving stress and infusing strength | 
*Rig Veda.* 9.97.16
“The powerful, flowing Soma . . . streams forth infusing strength. . . .” |
| “In meditation I had the experience of energy and strength flowing into my body. It was like my mind was a clear channel for energy to flow from an infinite pool into my physical body. Afterwards, my body exhibited increased strength and improved muscle tone.” |
| *Rig Veda.* 9.90.6
“. . . flow on destroying all evils by thy might. . . .” |
| 3. Experiences of transcendental consciousness as “the home of all knowledge” (52) | 
*Rig Veda.* 9.70.7
“. . . the contemplator of all. . . .” |
| “During meditation I experienced the finest level of creation where the awareness seemed to support and encompass all the aspects of intelligence simultaneously. In one experience it was like a lively, sparkling, milky pool glowing within itself, becoming more and more transparent. In another experience, I myself was within that pool and I was the inner controller or intelligence of all things.” |
| *Rig Veda.* 9.86.28
“. . . thou art the ruler of the whole world; so purified this universe is in subjection to thee.” |
| *Rig Veda.* 1.164.39
“Knowledge resides in the imperishable transcendental field.” |
| *Rig Veda.* 9.86.29
“Thou, O sage, art the ocean, thou art omniscient. . . .” |
| 4. Experience of the growth of the fifth state of consciousness | 
*Rig Veda.* 4.4.12
“. . . knowing no slumber.” |
| “I have often clearly experienced pure consciousness, or inner wakefulness continuing all throughout a night’s sleep, so that even though I was sleeping, inside I felt awake.” |
justifiably be referred to as "governors of the trends of time" (54).

The scientific research on the Age of Enlightenment Governor Training Courses has shown that a large number of people are now rapidly attaining the state of enlightenment. This influence of orderliness of the enlightened Governors of the Age of Enlightenment, together with the combined influence of well over one million participants in the Transcendental Meditation program spread all over the world is profoundly changing world consciousness, the collective consciousness of our time. * Maharishi has sought to accelerate this influence by establishing a World Government for the Age of Enlightenment with those graduates of the advanced courses whose thoughts and actions are in accord with all the laws of nature. The World Government for the Age of Enlightenment provides courses of knowledge and techniques for developing consciousness (Science of Creative Intelligence) to at least one percent of the population in every part of the world. The existence of one percent of the world population practicing the Transcendental Meditation technique, Maharishi says, will greatly facilitate the programs of positive social change of every government.

The achievement of the World Government for the Age of Enlightenment is in creating an influence of orderliness and balance that spontaneously radiates from the higher consciousness that is developing in the citizens of every nation through the Transcendental Meditation program. This achievement naturally unfolds the full potential of national life, automatically paving the way for every government to create success in all fields of their activity (54).

When we review the combined scientific evidence that the Transcendental Meditation program creates orderliness and balance in the lives of individuals and in society, and when we consider that this research was conducted on subjects from a wide range of social and cultural backgrounds in several countries, it is clear that we are witnessing an unprecedented scientific and social phenomenon.

Furthermore, when we see substantial evidence from research laboratories that *homo sapiens* is capable of attaining major states of consciousness, higher than those he has been living for many centuries, we can say with Maharishi that "through the window of science we see the dawn of the Age of Enlightenment" (53).

ACKNOWLEDGEMENTS

I wish to thank my wife, Rhoda, for all of her help, Dr. Lawrence Domash for his valuable suggestions, Dr. Demetri Kanellakos for the original inspiration to write this paper, and Dr. Barry Charles for his help with the production of this paper and the entire book. We thank Maharishi Mahesh Yogi for making supreme knowledge a living reality for us all.

REFERENCES


3. BAKKER, R. 1974. Decreased respiratory rate during the Transcendental Meditation technique: A replication. (Published in this volume.)

4. BAILOU, D. 1973. The Transcendental Meditation program at Stillwater Prison. (Published in this volume.)


9. BERKER, E. 1974. Stability of skin resistance responses one week after instruction in the Transcendental Meditation technique. (Published in this volume.)


11. BLASDELL, K. S. 1971. The effects of the Transcendental Meditation technique upon a complex perceptual-motor task. (Published in this volume.)

12. BLOOMFIELD, H. H. 1975. Some observations on the uses of the Transcendental Meditation program in psychiatry. (Published in this volume.)


14. BORLAND, C., and LANDRITH III, G. 1975. Influence of the Transcendental Meditation program on crime rate in cities. (Published in this volume.)

15. BRAUTIGAM, E. 1972. Effects of the Transcendental Meditation program on drug abusers: A prospective study. (Published in this volume.)


*See *Rise of World Consciousness*, 1976, MERU PRESS, and *Proclamations and Endorsements*, 1975, MERU PRESS.
18. CHILDS, J. P. 1973. The use of the Transcendental Meditation program as a therapy with juvenile offenders. (Published in this volume.)
19. COLLIER, R. W. 1973. The effect of the Transcendental Meditation program upon university academic attainment. (Published in this volume.)
20. COREY, P. W. 1974. Airway conductance and oxygen consumption changes associated with practice of the Transcendental Meditation technique. (Published in this volume.)
21. CUNNINGHAM, M., and KOCH, W. 1973. The Transcendental Meditation program and rehabilitation: A pilot project at the Federal Correctional Institution at Lompoc, California. (Published in this volume.)
22. DAVIES, J. 1974. The Transcendental Meditation program and progressive relaxation: Comparative effects on trait anxiety and self-actualization. (Published in this volume.)
23. DHANARAJ, V. H., and SINGH, M. 1973. Reduction in consummation changes associated with practice of the Transcendental Meditation technique. (Published in this volume.)
24. DOMASH, L. H. 1976. The Transcendental Meditation technique and quantum physics: Is pure consciousness a macroscopic quantum state in the brain? (Published in this volume.)
26. FARROW, J. T. 1976. Physiological changes associated with transcendental consciousness: The state of least excitation of consciousness. (Published in this volume.)
27. FEHR, T. 1974. A longitudinal study of the effect of the Transcendental Meditation program on changes in personality. (Published in this volume.)
28. FEHR, T.; NEERTHEIMER, U.; and TORBER, S. 1972. Study of personality changes resulting from the Transcendental Meditation program: Freiburger Personality Inventory. (Published in this volume.)
32. FRIEND, K. E. 1975. Effects of the Transcendental Meditation program on work attitudes and behavior. (Published in this volume.)
34. HAYNES, C. T.; HEBERT, J. R.; REBER, W.; and ORME-JOHNSON, D. W. 1976. The psychophysiology of advanced participants in the Transcendental Meditation program: Correlations of EEG coherence, creativity, H-Reflex recovery and experience of transcendental consciousness. (Published in this volume.)
35. HAYNES, C. T.; HEBERT, J. R.; REBER, W.; and ORME-JOHNSON, D. W. 1976. Increased EEG coherence during the Transcendental Meditation technique relative to an eyes closed precontrol period. Maharishi European Research University. (Unpublished data.)
36. HEATON, D. P., and ORME-JOHNSON, D. W. 1974. The Transcendental Meditation program and academic achievements. (Published in this volume.)
37. HEBERT, J. R. 1976. Periodic suspension of respiration during the Transcendental Meditation technique. (Published in this volume.)
38. HEBERT, J. R., and LEHMANN, D. 1976. Brain wave synchrony during the Transcendental Meditation technique: High amplitude theta spindles in normal adults. (Submitted for publication.)
42. JEVNING, R.; WILSON, A. F.; and SMITH, W. R. 1975. Plasma amino acids during the Transcendental Meditation technique: Comparison to sleep. Presented at a symposium of the International Association for the Psychophysiological Study of Sleep, Edinburgh. (Published in this volume.)
43. KATZ, D. 1974. Decreased drug use and prevention of drug use through the Transcendental Meditation program. (Published in this volume.)
44. KORY, R., and HUFNAGEL, P. 1974. The effect of the Science of Creative Intelligence course on High School students: A preliminary report. (Published in this volume.)
45. KRAS, D. J. 1974. The Transcendental Meditation technique and EEG alpha activity. (Published in this volume.)
46. LAURIE, G. 1973. An investigation into the changes in skin resistance during the Transcendental Meditation technique. (Published in this volume.)
47. LAZAR, Z.; FARWELL, L.; and Farrow, J. T. 1972. The effects of the Transcendental Meditation program on anxiety, drug abuse, cigarette smoking, and alcohol consumption. (Published in this volume.)
48. LEVINE, P. H.; HEBERT, J. R.; HAYNES, C. T.; and STROEBEL, U. 1975. EEG coherence during the Transcendental Meditation technique. (Published in this volume.)
49. MACCALLUM, M. J. 1974. The Transcendental Meditation programme and creativity. (Published in this volume.)
54. McCrANNAGH, J. M., and EGENES, T. 1973. The Transcendental Meditation technique and temperature homeostasis. (Published in this volume.)
64. prisoners practicing the Transcendental Meditation technique.

66. (Published in this volume.)

BRISTOL, D. E. 1975. The treatment of insomnia by the Transcendental Meditation program. (Published in this volume.)

67. Meditation program on compensatory paradoxical sleep. (Published in this volume.)

68. Meditation technique on reaction time. (Published in this volume.)

57. 60. MISKIMAN, D. E. 1973. The effect of the Transcendental Meditation program on the organization of thinking and recall (secondary organization). (Published in this volume.)

tation upon autokinetic perception. (Published in this volume.)


dental Meditation program in the treatment of insomnia. (Published in this volume.)


66. ORME-JOHNSON, D. W.; KIEHLBAUCH, J.; MOORE, R.; and BRISTOL, J. 1971. Personality and autonomic changes in prisoners practicing the Transcendental Meditation technique. (Published in this volume.)


68. PELLETIER, K. R. 1974. The effects of the Transcendental Meditation program on perceptual style: Increased Field Independence. Presented at a meeting of the Western Psychological Association, San Francisco. (Published in this volume.)


70. PIROT, M. 1973. The effects of the Transcendental Meditation technique upon auditory discrimination. (Published in this volume.)

71. REDDY, M. K.; BAI, A. J. L.; and RAO, V. R. 1974. The effects of the Transcendental Meditation program on athletic performance. (Published in this volume.)

72. RIMOL, A. G. P. 1974. The Transcendental Meditation technique and its effects on sensory-motor performance. (Published in this volume.)

73. ROUTT, T. J. 1973. Low normal heart and respiration rates in individuals practicing the Transcendental Meditation technique. (Published in this volume.)

74. SCHENKLUHN, H.; and GEISLER, M. 1974. A longitudinal study of the influence of the Transcendental Meditation program on drug abuse. (Published in this volume.)

75. SCHILLING, P. B. 1974. The effect of the regular practice of the Transcendental Meditation technique on behavior and personality. (Published in this volume.)


79. SHAPIRO, J. 1974. The relationship of the Transcendental Meditation program to self-actualization and negative personality characteristics. (Published in this volume.)

80. SHEETER, H. 1975. The Transcendental Meditation program in the classroom: A psychological evaluation. (Published in this volume.)

81. SIMON, D. B.; OPARIL, S.; and KIMBALL, C. P. 1974. The Transcendental Meditation program and essential hypertension. (Published in this volume.)

82. SMITH, T. R. 1974. The Transcendental Meditation technique and skin resistance response to loud tones. (Published in this volume.)

83. STERN, M. 1974. The effects of the Transcendental Meditation program on trait anxiety. (Published in this volume.)

84. TJOA, A. 1972. Some evidence that the Transcendental Meditation program increases intelligence and reduces neuroticism as measured by psychological tests. (Published in this volume.)

85. TJOA, A. 1975. Increased intelligence and reduced neuroticism through the Transcendental Meditation program. (Published in this volume.)

86. VAN DEN BERG, W. P., and MULDER, B. 1973. Psychological research on the effects of the Transcendental Meditation technique on a number of personality variables. (Published in this volume.)

87. VASSILJADIS, A. 1973. Longitudinal physiological changes as a result of participating in the Transcendental Meditation program. Presented at the American Psychological Association Convention, Montreal, Canada. (Also in Kanelkos, D. P. and Lukas, J. S. 1974, pp. 8–9, 89. The Psychobiology of Transcendental Meditation: A literature review. Menlo Park, Calif.: W. A. Benjamin, Inc.)


92. WELDON, J. T., and ARON, A. 1974. The Transcendental Meditation program and normalization of weight. (Published in this volume.)

93. WEST, M. A. 1973. Changes in skin resistance in subjects resting, reading, listening to music, or practicing the Transcendental Meditation technique. (Published in this volume.)

94. WESTCOTT, M. 1973. Hemispheric symmetry of the EEG...
during the Transcendental Meditation technique. (Published in this volume.)

95. Wilcox, G. G. 1973. Autonomic functioning in subjects practicing the Transcendental Meditation technique. (Published in this volume.)


99. Zamarra, J. W. M.; Besseghini, I.; and Wittenberg, S. 1975. The effects of the Transcendental Meditation program on the exercise performance of patients with angina pectoris. (Published in this volume.)