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The Cosmic Psyche as the Unified Source of Creation

Verification through Scientific Principles, Direct Experience, and Scientific Research

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Abstract

This article presents the basic view of Maharishi's Vedic Psychology: Objective and subjective existence have a common source—pure consciousness, the cosmic psyche—which is accessible as the simplest form of human awareness, transcendental consciousness. Maharishi's Vedic Psychology describes three fundamental properties of the cosmic psyche—self-referral, self-sufficiency, and infinite dynamism. This description has parallels in the foundational theories of physics, mathematics, physiology, and chemistry. Self-reported experiences of individuals who regularly enliven the qualities of the cosmic psyche within themselves through the TM program exemplify the way in which self-referral, self-sufficiency, and infinite dynamism become expressed in their lives. Scientific research on the TM and TM-Sidhi programs objectively indicates the growth of these fundamental properties of the cosmic psyche on all levels of life: physiological, psychological, sociological, and ecological.

This article is Chapter 1 of *The Vedic Psychology of Maharishi Mahesh Yogi: Fulfillment of Modern Psychology*. The introduction and 10 chapters of this book, which has been written by the faculty of the Psychology Department at Maharishi International University, are being serialized in this and subsequent issues of *Modern Science and Vedic Science*, and will be published in book form at the completion of the series.

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Introduction

It is present in all forms, words, smells, tastes and objects of touch; in everything experienced; in the senses of perception and organs of action; in all phenomena; in the doer and the work done; in all directions—north, south, east and west; in all times—past, present and future; It is uniformly present....Everywhere and in all circumstances Being, the essential constituent of creation, permeates everything. (Maharishi Mahesh Yogi, 1966, p. 29)

Knowledge of pure consciousness, the cosmic psyche, is the starting point and central core of the Vedic Psychology of Maharishi Mahesh Yogi. This article begins by presenting Maharishi's description of the fundamental properties of the cosmic psyche—*self-referral*, *self-sufficiency*, and *infinite dynamism* (Maharishi Mahesh Yogi, 1980, 1986).

It will be seen that Maharishi's description of these properties is consistent with numerous descriptions of the cosmic psyche, as recorded for instance in the ancient Vedic literature (see Dillbeck, in press). Yet Maharishi's analysis of the properties of the cosmic psyche provides a rich elaboration of the descriptions found in the Vedic literature, and presents them in a language easily translated into testable hypotheses.

The assertion that the cosmic psyche is the unified field of all the laws of nature implies that its basic properties should be evident in modern as well as ancient descriptions of nature. The article thus continues by locating the same fundamental properties Maharishi ascribes to the cosmic psyche in descriptions of nature from modern science. This section demonstrates that these properties of the cosmic psyche are fundamental principles found in physics, mathematics, physiology, and chemistry, supporting the view that the cosmic psyche is the unified field of natural law.

Maharishi's Vedic Psychology includes not only intellectual understanding of the cosmic psyche, but also a technology—the Transcendental Meditation (TM) technique—that allows an individual to directly experience the cosmic psyche, the field of pure consciousness.

The Transcendental Meditation technique is an effortless procedure for allowing the excitations of the mind gradually to settle down until the least excited state of mind is reached. This is a state of inner wakefulness with no

object of thought or perception, just pure consciousness aware of its own unbounded nature. It is wholeness, aware of itself, devoid of differences, beyond the division of subject and object—transcendental consciousness. It is a field of all possibilities, where all creative potentialities exist together, infinitely correlated but as yet unexpressed. It is a state of perfect order, the matrix from which all the laws of nature emerge, the source of creative intelligence. (Maharishi Mahesh Yogi, 1976, p. 123)

An analysis of reports by several individuals, representative of hundreds of thousands who have learned the Transcendental Meditation technique, provides examples of how self-reported experiences of changes that take place through TM can be categorized in terms of increased self-referral, self-sufficiency, and dynamism. These experiences thus exemplify the progressive development of the qualities of the cosmic psyche in daily life through regular practice of the TM technique.

The growth of these qualities has also been objectively verified by extensive scientific research on the TM technique and an advanced form of this practice, the TM-Sidhi program. Analysis of this research further illustrates how the qualities of self-referral, self-sufficiency, and infinite dynamism grow in all areas of life—physiological, psychological, sociological, and ecological—through practice of the TM and TM-Sidhi programs.

This exercise of locating these qualities of the cosmic psyche in the basic principles of science, in personal experiences of development of consciousness, and in the results of several hundred scientific studies demonstrates that Maharishi's Vedic Science, and hence Vedic Psychology, provides a unifying framework for highly disparate areas of life. As was argued in the introduction to this series (Orme-Johnson, 1988, in this issue), such an integration is essential. Lack of understanding of consciousness as the foundation of all fields of knowledge and human activity is responsible for the current state of fragmentation of knowledge, resulting in imbalances that have caused great human suffering and confusion. Life is not whole. The humanities are disconnected from the sciences. The religious world view conflicts with the scientific world view. Academic specialties are so fragmented and isolated that their relevance to broader issues of life is often obscure. The outstanding problems of the world, such as war and economic imbalances, are basically psychological in origin, yet there is little fundamental understanding either of consciousness or of its relation to the objective domain. Thus there is a clear need for a profound understanding of consciousness and its integration with all fields of knowledge.

The principles capable of such a broad unification will necessarily be most abstract and general because they need to apply to everything. They might sound too general to a scientific mind that is used to the precise mathematical correspondences characteristic of specialized fields of science. In order to be successful, however, these principles must be general for they must express the deepest principles of nature's functioning that underlie all subjective as well as objective phenomena. They must be so abstract as to describe accurately the fundamentals of literature (R. Orme-Johnson,

1987) and education (S.L. Dillbeck & M.C. Dillbeck, 1987), as well as the equations of quantum field theory (Hagelin, 1987) or the foundational theories of modern mathematics (Weinless, 1987). They must represent the most basic patterns of nature, upon which all other patterns are but themes and variations.

Maharishi has identified numerous qualities of the cosmic psyche/unified field, including perfect order, infinite organizing power, total potential of natural law, unboundedness, pure knowledge, and pure intelligence. Any of these (and perhaps some others) could serve as unifying principles. However, self-referral, self-sufficiency, and infinite dynamism were chosen because they appear to reflect most fundamentally the dynamics of self-interaction of the cosmic psyche at the basis of natural law.

Part I
The Qualities of the Cosmic Psyche:
Self-Referral, Self-Sufficiency, and Infinite Dynamism

From Maharishi's perspective, the recent formulation of unified field theories in physics (Hagelin, 1987) has touched upon a universal reality that has been known in its completeness from time immemorial through the subjective approach of the ancient Vedic tradition: "The knowledge of the unified field has been discovered by modern science during just the last few months and years, but the complete knowledge of the unified field has always been available in the Vedic literature" (Maharishi Mahesh Yogi, 1986, p. 29). Maharishi's Vedic Psychology equates the unified field—proposed by some physicists as the unified source of all creation—with the cosmic psyche, the field of pure consciousness, known as *Samhita* to ancient Vedic Science, which Maharishi has revived. Maharishi attributes three primary qualities to the cosmic psyche in its role as the source of creation—self-referral, self-sufficiency, and infinite dynamism. These qualities are intimately related because they bring out different aspects of the same creative processes intrinsic to the nature of the cosmic psyche, pure consciousness.

Self-referral. Maharishi explains that the cosmic psyche, the field of pure consciousness, is fully awake to itself and is therefore self-referral. Self-referral means "self-awareness." On the level of the cosmic psyche there is nothing else to be aware of but awareness itself. Maharishi explains that in the process of pure consciousness becoming aware of itself, its unbroken wholeness (*Samhita*) differentiates into three values: it becomes at once the knower, the process of knowing, and the known, which are known in Maharishi's Vedic Science as *Rishi*, *Devata*, and *Chhandas*.

This is precisely the three-in-one structure of the self-referral state of consciousness. This structure is very simple to understand. The awareness is open to itself, and therefore the awareness knows itself. Because the awareness knows itself it is the knower, it is the known, and it is the process

of knowing. This is the state of pure [consciousness], wide-awake in its own nature and completely self-referral. (Maharishi Mahesh Yogi, 1986, p. 29)

Maharishi asserts that this self-referral activity of the cosmic psyche at the basis of nature is reflected in all aspects of natural law. All the forms and phenomena in the universe arise from the self-referral manifestations of the cosmic psyche.

Innumerable tendencies are arising in creation. From this one can imagine there must be innumerable qualities of self-interaction in the self-referral state of consciousness. Vedic Science completely reveals the knowledge of that reality, where the innumerable values of the knower, the known, and the process of knowing are contained in that sea of consciousness. Thus the perpetual continuum of the self-referral state of consciousness is known to be responsible for the infinite variety of creation. (Maharishi Mahesh Yogi, 1986, p. 30)

From the perspective of Maharishi's Vedic Psychology, the entire universe is thus an expansion of the cosmic psyche's self-referral dynamics, through which it knows itself in its infinite range of possibilities.

Maharishi's description of the self-referral process of creation is also recorded in the Vedic literature, which is considered by Maharishi's Vedic Psychology to contain the most accurate, as well as the most ancient, reports of the subjective experience of the cosmic psyche. For example, Maharishi points out that the self-referral character of the cosmic psyche is given expression in the *Bhagavad-Gita*:

prakritim svam avashtabhya visrijami punah punah

Curving back on my own nature, I create again and again.¹

(IX.8)

"Curving back on my own nature" refers to the process of awareness being aware of itself. "Again and again" refers to the iteration of this process: awareness being aware of itself, being aware of being aware of itself, and so forth.

The self-referral state of pure consciousness...is an infinitely dynamic, inexhaustible source of energy and creativity. On that basis the whole creation goes on perpetually in its infinite variety, multiplying itself all the time. (Maharishi Mahesh Yogi, 1986, p. 30)

One of Maharishi's unique contributions to the understanding of the relationship between Vedic literature and the process of creation is contained in his description of *Apaurusheya Bhashya*. Maharishi's *Apaurusheya Bhashya*, the "eternal uncreated commentary," refers to the continual self-referral processes within the unified field, which cause it to manifest into subjective and objective creation. Maharishi's *Apaurusheya Bhashya* describes creation as an expanding self-commentary of the cosmic psyche upon itself, level upon level of consciousness being aware

¹ Translations of Sanskrit passages into English are based on Maharishi's translations

of its own three-in-one structure creates all possibilities of relationships between knower, known, and knowledge. (See Dillbeck, in press.)

This property of self-referral, intrinsic to the cosmic psyche, is experienced differently in different states of consciousness. (See Orme-Johnson, 1988, in this issue for a discussion of Maharishi's seven states of consciousness.) In ordinary waking consciousness, self-referral can be seen as the unique ability of consciousness to reflect upon its own nature. This ability is experienced subjectively as the mind observing its own thoughts and the body's actions. The inward phase of self-reflection by the mind in waking state, however, does not ordinarily reach the silent, completely integrated state of transcendental pure consciousness, the cosmic psyche. The knower, known, and process of knowing are experienced separately in the waking state, whereas they are experienced as united in transcendental consciousness. Moreover, the primary experience in the waking state is of the known—the thoughts, feelings, and perceptions of the mind and the actions of the body. The knower and process of knowing are almost entirely absent from awareness (e.g., Maharishi Mahesh Yogi, 1969, pp. 237-238, 240-242, 343, see also the third article in this series). As Maharishi notes, the limitations of this experience are reflected in modern science:

Through its objective approach, modern science reveals that which is perceived, the object. The subject, the perceiver, remains separate from it. Modern science investigates into the field of the known, but it does not touch at all the field of the knower and the spontaneous process of knowing. (Maharishi Mahesh Yogi, 1986, pp. 27-28)

Thus, although self-referral in the sense of the ability to reflect on one's own experience is evident in normal waking state experience, the three-in-one structure of self-referral pure consciousness is unavailable.

Maharishi explains that the development of higher states of consciousness can be understood as the development of more integrated values of self-referral. As will be more fully explained in the third article in this series, the fourth state of consciousness, transcendental or pure consciousness, is the pure experience of the self-referral value of consciousness described above. In the fifth state of consciousness, cosmic consciousness, this self-referral awareness is experienced along with waking, dreaming, and sleeping states of consciousness. On the highest level of evolution, unity consciousness, one knows all things to be composed of the same self-referral consciousness as the pure consciousness at the basis of one's own psyche.

Self-sufficiency. We have explained that the cosmic psyche's basic character of awareness makes it self-referral, and that this process of self-referral sets in motion dynamics that lead to the creation of the universe. Maharishi explains that, on the basis of these self-referral dynamics, another primary property of the cosmic psyche is self-sufficiency: it is the

total potential of natural law that creates from within itself through its own self-referral property.

At the basis of all creation there is something which is wide awake in itself, something which must necessarily be completely self-sufficient because...from there it has to evolve into the whole creation. That is why we take that level of creation to be unmanifest, but completely self-sufficient. (Maharishi Mahesh Yogi, 1980, p. 10)

The cosmic psyche is self-sufficient because it does not need anything outside itself to exist or to create.

In Vedic Science, the self-sufficiency of the cosmic psyche is expressed as *Aham Brahmasmi*—"I am the self-sufficient, eternal wholeness of existence."

Existence, life or Being [cosmic psyche] is the unmanifested reality of all that exists, lives or is....It is...the basis of all the phenomenal existence of cosmic life. It is the source of all time, space and causation....the all-pervading eternal field of...creative intelligence. I am That eternal Being, thou art That and all this is in its essential nature That eternal Being. (Maharishi Mahesh Yogi, 1966, p. 28)

Maharishi explains that this experience of the cosmic psyche as the totally self-sufficient basis of creation characterizes unity consciousness. (See the third article in this series.)

The growth of self-sufficiency is evident even in waking consciousness. In the normal process of maturation, individuals become increasingly less dependent on the environment and are increasingly competent to use their own resourcefulness to create whatever they want in life. From Maharishi's perspective, this natural growth of self-sufficiency reflects the increasing ability of the mind and body to express the self-sufficiency inherent in its foundation, the cosmic psyche. In its unrestricted form, which develops through the practice of the Transcendental Meditation and TM-Sidhi programs, maturation is guided by the evolution of consciousness, which is supported by the increasing flexibility and power of the neurobiology. Through maturation, individual consciousness increasingly becomes an expression of the total potential of natural law. Maharishi explains that as an individual matures into higher states of consciousness, he or she grows in the ability spontaneously to think and act in accord with natural law, utilize more of the organizing power of nature, and experience more of the support of nature: all these increase self-sufficiency. (The seventh article in this series will describe these mechanics in depth.)

Infinite dynamism. Maharishi describes a third primary property that co-exists with the self-referral and self-sufficiency of the cosmic psyche—the property of infinite dynamism. He explains that the cosmic psyche must be infinitely dynamic because its activities are continuously creating and upholding the universe. This infinite dynamism arises from the

simultaneity of the three-in-one structure of the cosmic psyche.

In that pure consciousness we have three values—observed, observer and observation—and we have one unified state of the three. Here we have one and three at the same time. When we have one and three together in that self-referral state of pure consciousness, there is that infinite contraction for remaining one and there is that quick expansion to become three. When they are simultaneously three and one there is infinite dynamism (Maharishi Mahesh Yogi, 1985, p. 65)

Maharishi also describes the cosmic psyche as an infinitely oscillating, or vibrating, expansion and contraction between infinity and point—the infinitely oscillating knowledge of its all-possibilities nature.

Infinity, fully awake to itself, is fully awake to its infinite value. At the same time, it is awake to its point value. In this we find the dynamism of infinity converging to a point and a point expanding to infinity. This [is the] infinite dynamism of the self-referral nature of pure consciousness... (Maharishi Mahesh Yogi, 1985, pp. 65-66)

Thus, Maharishi has explained the infinite dynamism of the cosmic psyche in two ways: (1) in terms of the infinite "oscillation" between its structure as three (observer, observed, and process of observation) and one (pure consciousness), and (2) in terms of the infinite oscillation between the extremes of its nature as point and infinity. In both explanations, infinite dynamism is seen to be a spontaneous product of the self-referral activity of the cosmic psyche. This simultaneous unobstructed awareness of the parts of the system and the wholeness of the system constitutes a perfect flow of information between the parts and the whole.

The quality of dynamism of the parts seen in manifest creation is comprised of differentiated, highly specific, and accurate sequences of events. Through improved communication with its integrating source, the sequence maintains a continuous unbroken flow of unerring progress towards the goal, and this is what makes action dynamic. According to Maharishi, pure consciousness is the source, course, and goal of action because from the perspective of unity consciousness, action begins in the unmanifest field of pure consciousness; its manifestations are nothing other than modes of pure consciousness, and the ultimate goal of action is unity consciousness, a return to the source. Therefore, when pure consciousness is enlivened in awareness, it begins to maintain the continuous integration of the action from its inception to its completion. The regular experience of pure consciousness through the TM program, along with regular integration of different aspects of psychophysiological functioning with pure consciousness through the TM-Sidhi program, is thus predicted to enhance the flow of information within the system, maintaining the connection of action with its source throughout its course to its goal, thus increasing dynamism in every area of life.

As will be discussed in the second and fifth articles in this series, when the nervous system becomes fully developed in unity consciousness, the

unmanifest vibration of the cosmic psyche becomes directly experienced as Vedic cognition, direct perception of the unmanifest dynamics of natural law.

It may be noted that the basic dynamical relationship between infinity and a point in the self-referral wholeness of the cosmic psyche is expressed in waking state consciousness whenever whole and parts are interrelated. The concept of infinite dynamism provides a universal model for analyzing any process of consciousness. One need only look for the wholeness and point value in any situation to gain insight into its dynamics. For example, in generating or understanding a sentence, the individual words (point values) are understood in terms of the meaning (wholeness) of the sentence. The same principle is true for any perceptual or cognitive process: The part is always understood in the context of the whole, and the whole is given concrete meaning with reference to its parts. As noted in the introduction (Orme-Johnson, 1988, this issue), the ultimate wholeness of consciousness is pure consciousness, the knower and interpreter of experience.

In communication, to give another example, the wholeness of the meaning of the information is first structured in the consciousness of the speaker (e.g., Chafe, 1985). It is then projected out into point values of words. The words are then interpreted by the listener in the context of the wholeness of his consciousness. This example shows how the same dynamics of infinite dynamism, seen in the cosmic psyche interacting with itself, characterize the process of communication between individuals (see Maharishi's Absolute Theory of Information, Maharishi Mahesh Yogi, 1976, p. 150).

In science, data gain meaning in relationship to the wholeness of a scientific principle, hypothesis, theory, or paradigm (e.g., Nagel, 1979). In turn, the theories or principles are "wholes" that are comprehended with reference to the data they explain. In the applied technologies of science, the dynamic relationship between whole and part can be seen in the application of theories or principles in specific contexts. The evolution of science is towards more comprehensive theories that can provide increasingly precise explanations of specific phenomena—towards the expression in human knowledge of the same infinity and point values which fundamentally characterize the infinite dynamism of the cosmic psyche.

Drawing on the insights of the Vedic literature, Maharishi explains that the means of bringing the infinite dynamism of the unified field to all phases of life is to establish a lively relationship within one's own consciousness between infinity and its own point value. This principle is expressed in the *Bhagavad-Gita* as *Yogastah kuru karmani*—"Established in Yoga [union with the cosmic psyche], perform action" (Maharishi Mahesh Yogi, 1969, 11.48). Union of one's individual mind with the cosmic psyche makes the individual psyche unbounded, infinite, and infuses every action with unbounded awareness. When the individual is established in pure consciousness—the unbounded source of knowledge,

power, and creativity—his every thought, word, and action express infinite dynamism. (This point will be further elaborated in the seventh article in this series.)

Part II

Verification of the Qualities of the Cosmic Psyche

Scientific Principles

The previous section presented three properties of the cosmic psyche that Maharishi directly relates to its role as the unified source of all the laws of nature. The knowledge of these properties of self-referral, self-sufficiency, and infinite dynamism comes first from the direct subjective experience of the cosmic psyche in its form of pure consciousness. However, if the cosmic psyche is the unified source of both subjective and objective creation, then these properties should be evident not only in descriptions of subjective experience of the cosmic psyche, but also **in** objective accounts of the universe. As the most credible objective accounts of the universe are currently provided by the scientific disciplines, in this section we will analyze four fundamental scientific disciplines—physics, mathematics, chemistry and physiology—to see whether these properties of the cosmic psyche are also fundamental to an objective view of nature.

Self-referral, self-sufficiency, and infinite dynamism in physics. In 1966, Maharishi predicted that the discovery of a unified field of physics was imminent:

In his attempts to establish scientifically the unified field theory, Einstein seems to have been clearly aware of the possibility of one basis for all diversity, one common denominator for all the multiplicity of creation. He was at least trying to establish one constant as the basis of all relative existence. If physical science should arrive at the conclusion which Einstein was trying to pinpoint with his unified field theory, one constant would be established as the basis of all relative creation. With the rapid pace of development in nuclear physics, the day does not seem far off when some theoretical physicist will succeed in establishing a unified field theory. It may be given a different name, but the content will establish the principle of unity in the midst of diversity, the basic unity of material existence. (p. 34)

Maharishi (1966) goes **on** to explain how this discovery of the unified field would provide the impetus for the rapid development of the new psychology:

The discovery of this one basis of material existence will mark the ultimate achievement in the history of the development of physical science. This will assist in turning the world of physical science towards the science of mental phenomena. Theories of mind and Being will supersede the findings of physical science. At the extreme limit of investigation into the nature of reality in the field of the mind will be found the state of pure consciousness, that field of transcendental nature lying beyond all the relative existence of

material and mental values. The ultimate field of Being lies beyond the field of mental phenomena and is the truth of life in all its phases, relative and absolute. The science of Being is the transcendental science of mind. (It transcends the science of mind which, in its turn, transcends the material sciences which deal with the diversity of material existence. (pp. 34-35)

Recent research in physics has confirmed these predictions. Hagelin (1987) has reviewed the rapid progress of physics towards a unified field theory and has explored striking parallels between unified field theories of physics and the field of pure consciousness as described by Maharishi's Vedic Science. In the early 1970s, physics made a fundamental advance in unified field theory with the development of the mathematics of supersymmetry, which for the first time made it possible to unite force (bose) and matter (fermi) fields—quantum fields that were previously thought to be irreconcilably diverse. In the last two years, rapid developments in superstring theory have made it possible to account for the diversity of phenomena in the universe as different vibrational modes of the superstring field. Recently, Hagelin and his colleagues have developed a new superstring-inspired Grand Unified Theory, Supersymmetric Flipped SU(5), which unites the electro-weak force and the strong force and offers solutions to several outstanding technical problems that existed in both particle physics and cosmology. It is clear that physicists today are beginning to appreciate fully the unified level of nature's functioning that is described in Maharishi Vedic Science and Technology (Antoniadis, Ellis, Hagelin, & Nanopoulos, 1987; Ellis, Hagelin, Kelly, & Nanopoulos, 1988).

With regard to the relationship of consciousness to physical existence, materialists might argue that the unified field is a field of physical reality only, e.g., that physical reality is primary and that consciousness emerges in biological evolution as a by-product of brain functioning (see introduction, Orme-Johnson, 1988). One widely held paradigm states that consciousness is entirely a product of complex biochemical processes occurring within the brain. However, Hagelin (1987, p. 58) points out that this view is merely one among many. One of his arguments for asserting that the unified field is the source of consciousness as well as of physics involves demonstrating that at the scale of super-unification, nature displays attributes characteristic of pure consciousness: self-referral, self-sufficiency, and infinite dynamism.

The self-referral quality of the superstring field is found in the unitary transformations of the unified field, which represent the fundamental laws of nature responsible for creating and governing manifest existence. In these unitary transformations, the totality of knowledge of the unified field is preserved; thus the field refers to itself—that is, maintains its own nature—as it transforms itself in the process of creating its expressions.

Unified field theories of physics also describe the superstring field as the self-sufficient source of all creation. All forms and phenomena are created through self-interaction of the superstring field. Similarly, in the "big bang" theory of cosmology, the original space-time singularity is

the infinitely compact, self-contained state of all the laws of nature, the self-sufficient source of the universe.

Physics further verifies the description of the unified field of natural law as infinitely dynamic. It is the dynamical coexistence of all possible modes of behavior on the quantum-mechanical level that gives rise to the perfect economy of the observed behavior of nature. Infinite dynamism is also the characteristic of the Planck Scale, the finest scale of physical measurement.

Dynamism, for instance, results from the fact that quantum-mechanical properties associated with position and momentum do not commute, leading to a reciprocal relationship between distance and momentum known as the uncertainty principle, which results in the fact that nature becomes increasingly energetic at more fundamental space-time scales. (Hagelin, 1987, p. 58)

Thus it appears that in unified field theory, modern science has glimpsed the reality of the cosmic psyche described in ancient Vedic Science.

Self-referral, self-sufficiency, and infinite dynamism in mathematics. Weinless (1987) has examined the relationship between foundational areas of modern mathematics and Maharishi's formulation of Vedic Science. He shows that the set-theoretic concept of the *absolute infinite*, as expressed both in the *universe of sets*, V , and in the *absolute ordinal*, Q , provides a natural mathematical expression of the transcendental reality of pure consciousness, as described in Vedic Psychology. In Weinless's analysis, the Transcendental Meditation and TM-Sidhi programs provides access to a level of experience in which much of the abstract structural content of modern mathematics is seen to be directly mirrored; mathematics is seen to provide a very precise analytic commentary on the structure and dynamics of the most fundamental level of one's own intelligence. In the context of Vedic Psychology, the foundational theories of mathematics appear to describe the functioning of the intellect, the discriminative aspect of the cosmic psyche (see Dillbeck, in press), and its interaction with the unbounded value of the cosmic psyche.

Set theory, which is at the foundation of mathematics, expresses the qualities of self-referral, self-sufficiency, and infinite dynamism. The elements of a set are objects of thought and therefore correspond to the value of the known in Vedic Psychology. The wholeness of the set corresponds to the knower, while the membership relation between the set and its members corresponds to the process connecting the two. Weinless notes that a set has two aspects—its value as a whole, in relation to its elements, and its value as a point, as a single element of another set. A set as a whole expresses the knower or Rishi value and the set as a point expresses the known or Chhandas value. Weinless notes that the concept of a set is implicitly self-referral because the elements of a set are themselves sets; the point values of one set are the wholeness value of some other sets.

The self-referral nature of the membership relation is expressed more explicitly in the context of the universe of sets, V , and the *reflection principle*. The universe of sets is the wholeness of all possible sets, it is the ultimate transcendental wholeness of set theory. This mathematical wholeness itself cannot be regarded as a set; that is, it cannot have the self-referral property of being an element of itself, as that would lead to logical inconsistencies. A deep principle of set theory, the reflection principle, nevertheless upholds the self-referral nature of the universe of sets. The reflection principle asserts that if P is any conceivable structural property, and if V has property P , then there must exist a set S having property P . This means that V , although not containing itself as an element, does contain elements reflecting each of its conceivable properties. The reflection principle thereby expresses, the self-referral nature of the transcendental wholeness of mathematics, the universe of sets, in a logically consistent way (Weinless, 1987, pp. 146-151).

The properties of self-sufficiency and infinite dynamism are expressed in the mechanics of set formation. Self-sufficiency is seen in the creation of the universe of sets out of nothing, the null set, through the iterative process of set formation, the sequential process whereby all possible sets sequentially unfold in expanding layers from the point value of the null set (Weinless, 1987, p. 154). The iterative mechanics of set formation also expresses the property of infinite dynamism in a number of ways. One striking example is provided by the way the power-set operation creates uncountably infinite sets; this process expresses the dynamics of a level of intellect capable of an infinity of simultaneous choices (Weinless, 1987, pp. 155-156).

Weinless explains that the null set expresses that value of consciousness in which the knower value is lively (it is a wholeness, a set) and yet there is no object of perception (there are no elements).

This is precisely the structure of transcendental consciousness, in which consciousness is fully awake within itself and yet there is no object of perception. Transcendental consciousness contains within its own structure the infinite dynamism of the samhita [cosmic psyche] at the source of the sequential emergence of the richas [expressions] of the Veda. In this sense the null set can be said to contain within its own structure the infinite dynamism of intelligence that sequentially unfolds all sets from the point value of the null set. (Weinless, 1987, p. 153)

The reader is referred to Weinless's article for many more insights into how foundational mathematics expresses the dynamics of the cosmic psyche as described in Maharishi's Vedic Science and Technology.

Self-referral, self-sufficiency and infinite dynamism in physiology. Wallace, Fagan, and Pasco (1988) explain how the living organism is a nested hierarchical structure of levels of self-referral systems, ranging from the molecular level of DNA to the whole organism. They review evidence that the Transcendental Meditation and TM-Sidhi program create integration and coherence in this infinitely complex system of

self-referral loops to achieve the ultimate expression of the self-referral of the cosmic psyche—unity consciousness.

Their article explains that at the basis of all physiological processes is the macro-molecule DNA, the "storehouse of biological information." DNA and a copy of its information in messenger RNA (mRNA) contain all of the information that governs the hierarchy of expressed levels of physiological structures and functions. DNA and mRNA carry the information that structures proteins; proteins or enzymes serve as the catalytic or regulatory components of biochemical pathways; biochemical pathways are responsible for the synthesis and functioning of the cellular components; cellular components form the basis for the functioning of cells; cells form the various tissues; tissues structure the various organs; organs are components of the organ system; and all these levels together form the organism as a whole (see Wallace et al., 1988, p. 13 and Figure 1). Since the structure of DNA was discovered, research over the last twenty-five years has demonstrated that this uniquely organized molecule carries all the biological information to form, maintain, and reproduce the entire organism.

Upon examination, DNA clearly reflects the self-referral character of the cosmic psyche. Cells grow and thrive through self-referral to the genome, the complete set of "blueprints" specifying every structure and function in the cell.

In gene expression, self-referral is seen when regulatory proteins, such as apoinducers or repressors, "curve back to" and interact with the DNA to modulate the expression of information contained therein. This is self-interaction and self-referral in the sense that the structure of the repressors and apoinducers are themselves specified by blueprints that are stored within the DNA. Thus, when the apoinducer interacts with the DNA, we have one form of biological information (the expressed form, here the apoinducer) interacting with another form of biological information (the unexpressed form—a specific regulatory sequence, such as an operator sequence, within the DNA molecule). (Wallace et al., 1988, p. 13)

Self-referral is expressed throughout every level of physiological structure as homeostatic feedback mechanisms, which make the system self-sufficient with respect to a changing environment.

Homeostasis refers to the ability of a living system to maintain internal stability and order in the presence of change in the environment, through self-regulating feedback systems. The principle of homeostasis is perhaps the single most important concept in physiology. All the various biochemical and cellular processes, as well as the function and structure of tissues, organs, and organ systems, are governed by these self-referral, homeostatic mechanisms. (Wallace et al., 1988, p. 13)

All homeostatic feedback systems contain three components, an afferent limb, corresponding to the knower, an efferent limb through which it initiates new activity (the known), and an integrating center, which connects the afferent and efferent limbs, corresponding to the process of

knowing. For example, specific receptors continuously sense the levels of vital parameters such as blood pressure, acid-base balance, water and electrolyte balance, oxygen and carbon dioxide levels, and blood glucose levels. The current levels of these parameters in the body are referred back and compared to an internal set-point in the integrating center. As a result, the efferent limb is activated to restore balance and stability to the system. The more efficient these self-referral feedback systems are, the greater freedom the organism has to move through different environments in a self-sufficient way.

The nervous system and endocrine system provide elegant examples of homeostatic feedback systems. Higher organisms, such as mammals, are able to live in a much wider range of environmental conditions than less evolved species, such as reptiles, just because their more highly developed neuro-endocrine systems have provided them with greater self-sufficiency—greater ability to maintain optimal levels of their internal milieu in the face of highly contrasting external environments. In turn, being more self-sufficient provides the basis for the greater dynamism seen in higher-order species. As will be detailed in the last section of this article, research strongly supports the contention of Wallace et al. (1988) that the Transcendental Meditation and TM-Sidhi programs fully "enliven the self-referral functioning of the human physiology with the result that every part of the physiology, as well as the organism as a whole, functions in perfect attunement with the totality of natural law" (p. 15).

Self-referral, self-sufficiency, and infinite dynamism in chemistry. The properties of self-referral, self-sufficiency, and infinite dynamism are expressed in the transition states of chemical reactions. Quantum chemistry has identified the electromagnetic field as the arena of these transitions because it is this field that mediates interactions between electrons and atomic nuclei.

The electromagnetic field is one manifestation of the unified superstring field of physics, one of its "point" values. At the same time it is a wholeness in its own right, the "unified field" of the world of chemical kinetics. The transition state in chemistry has been described as the

state in the stepwise process of molecular change [that] is the most lively expression of the transition dynamics and determines the range of product states possible in any particular reaction. The concept of the transition state need not be restricted to the usual atomic and molecular levels of chemistry, but applies to all levels of interaction, including the nuclear and sub-nuclear levels of chemistry. The analysis of the transition state in any reaction reveals the functioning of a fundamental principle: an unbounded holistic field, completely self-referral in its nature, underlies all transition dynamics. (Maharishi European Research University, 1984, p. 4)

These qualities are found operating in all areas of chemistry that involve chemical transitions. For example, in non-equilibrium thermodynamics, self-referral is found in the functioning of autocatalytic processes.

Orderly structure in open, non-equilibrium systems is generated when a fluctuation in an unstable state is amplified by autocatalytic (self-referral) processes, causing the system to select from the many potential stable states which are available to it, one specific state. (Maharishi European Research University, 1984, p. 22)

Autocatalytic processes, which are inherently self-referral and self-sufficient, are found operating at all levels of cosmic life. They amplify the inherent dynamism of the fluctuations responsible for the complex structures in nature (for example convection cells, the human body, and the biosphere).

Thus, the qualities of self-referral, self-sufficiency, and infinite dynamism are found at all levels of life analyzed by chemistry. The manifestation of these qualities in chemical reactions is based on the fact that all chemical transitions are ultimately understood as quantum mechanical phenomena. Modern chemistry includes in its basic model of nature the same unified field described by physicists and shares an appreciation of the usefulness of its fundamental qualities of self-referral, self-sufficiency, and infinite dynamism for describing the dynamics of chemical reaction.

Direct Experience

The previous sections have presented three qualities of the cosmic psyche that are fundamental to its role as the source of nature's functioning. These properties are evident both in Maharishi's description of the cosmic psyche as a field of pure consciousness and in objective accounts of the universe found in fundamental scientific disciplines.

As mentioned in the introduction to this article, Maharishi's Vedic Psychology includes not only descriptions of the cosmic psyche, but also a technology—the Transcendental Meditation technique—that takes the mind through successively subtler levels of thought to experience the cosmic psyche as the state of least excitation of consciousness, the simplest form of human awareness.

During the Transcendental Meditation technique, the awareness experiences progressively quieter or lesser excited states of the thinking process until the finest or quietest level of thought is transcended to reach a state of pure awareness....The regular experience of the state of least excitation of consciousness results in a progressive infusion of the qualities of this state into the thinking mind....(Maharishi Mahesh Yogi, 1978, pp. 399-400)

Maharishi's explanation of the effects of practicing the Transcendental Meditation technique implies that the qualities of self-referral, self-sufficiency, and infinite dynamism are infused into the life of the meditator. They should be evident in all states of consciousness, including waking, dreaming, and sleep, and they should be enhanced through the development of the sequence of higher states of consciousness (see Orme-Johnson, 1988, and the third article in this series). In the next section we will see how the TM program accelerates

the development of these properties of the cosmic psyche as meditators evolve towards higher states of consciousness.

Enhanced self-referral, self-sufficiency, and infinite dynamism through the TM program. Knowledge of self-referral, self-sufficiency, and infinite dynamism provides a powerful framework for understanding experiences that take place during the regular practice of the Transcendental Meditation program. Infusion of the quality of self-referral into their lives would be indicated when meditators report, for instance, a sense of increased self-knowledge, or increased calm and happiness (a reflection of the wholeness of the cosmic psyche), or a feeling of nourishment of all aspects of life from within. Increases in the quality of self-sufficiency would be indicated by reports of increased stability in one's self, feelings, thoughts, and behavior, or feelings of increased strength and health and decreased dependence on drugs and other life-damaging habits.

Maharishi explains that the process of swinging the awareness between unbounded awareness (infinity) during meditation and focused awareness (point) during activity outside of meditation habituates the physiology to operate with a greater dynamic range, allowing more energetic, dynamic behavior (Maharishi Mahesh Yogi, 1969, p. 314). The mind also becomes more dynamic through connecting the manifest point values of thought and perception with their unmanifest infinite source of order in the cosmic psyche. The growth of the quality of infinite dynamism in meditators' lives would be indicated, therefore, by reports of increased mental clarity, the growth of new abilities, more effortless accomplishments, improved interpersonal relations, or more practical, effective behavior.

The following unedited personal experiences of practitioners of the Transcendental Meditation program were written prior to the analysis of experiences in terms of self-referral, self-sufficiency, and infinite dynamism, and before scientific research had been conducted on the program. Analysis of the language chosen by these individuals to describe their experiences, however, demonstrates how the three fundamental qualities of the cosmic psyche grow through the practice. It can also be seen through these experiences that all three qualities spontaneously and simultaneously develop together because they are different aspects of the same reality.

For the following seven examples, each quotation is preceded by the gender, age, occupation, and length of time practicing the Transcendental Meditation technique. Each experience is then analyzed in terms of the growth of all three qualities.

Example 1: Male, 28, insurance agent, graduate student, 1 year

Before starting TM, I was living a bit with the feeling that there was something lacking in my life. I searched to fulfill my need for the "something" in many different ways, never finding a lasting form of satisfaction for my heart or mind. Above all, I was looking for stability in my life and could never find it.

My search led me to TM and soon it became apparent that what I had

found and begun to experience was possibly what I had been looking for. After meditating for one year, I now know that TM has given me the stability that I had been searching for in my life. Also, I have noticed that the qualities of both heart and mind have been greatly enhanced in the last year, and that my life has become fuller, more beautiful and happier. I realize that TM is not an end in itself, but is a technique that will enable one to reflect Being in all its glory.

The predominating quality of the cosmic psyche reported by this 28-year-old insurance agent is self-sufficiency, but as we will consistently find in the following experiences, the growth of that quality was dependent on the initial self-referral experience that comes from the practice of the Transcendental Meditation technique. The growth of self-sufficiency is reflected in experiences of greater stability, fullness, beauty, and happiness. Without the inner connection with the cosmic psyche, the "lasting form of satisfaction for the heart and mind," these experiences are momentary, while through the self-referral practice of the Transcendental Meditation program they become a continuous experience underlying one's activity.

Example 2: Female, 33, homemaker, 19 months

I was not peaceful and happy because I seemed to have continued conflict and frustration going on within myself. I was satisfied with my marriage, glad I had married my husband, had three beautiful children and all I could want in a material sense. However, I knew something was lacking. I felt always a deep sense of what was the point of existence. Was all we have to look forward to old age, bad health and death? When I was engaged in some sport activity I thoroughly enjoyed myself, but could never sit still for long without feelings of anxiety.

The main and immediate benefit was the feeling that there really was more to life. I would definitely say that my whole life changed, the day I started meditating, into one of happiness and hope. Since then I have become increasingly more stable in my own self, thoughts, and feelings. Health is better, happiness is much more, and coordination and perception are noticeably improved.

The intimate connection between self-referral, self-sufficiency, and infinite dynamism is again evident in this quotation. This woman reports lacking a deep feeling of connection to herself, a lack of self-referral. She expresses a desire to have a deeper sense of the "point of existence." Once she begins to experience the inner core of her mind, the cosmic psyche, she feels there is more to life and immediately begins to feel greater happiness and hope. As a result of this increased self-referral, she reports more stability (more self-sufficiency) and her interaction with the environment is "noticeably improved," an indication of increased dynamism.

Example 3: Female, 17, student, 14 months

Before I started meditating I was basically content but I was in search of something more of life. Now I found it. I have become much more calm, my health has improved, my mind has become 100% clearer and sharper, my whole outlook on creation and life has had a drastically beautiful change.

This student also wanted to find a deeper meaning to life. She reports experiencing a change toward more calmness, improved health, and more precise, clear activity within the mind. These benefits result from the increased identification of the mind with its basis, the simplest form of awareness, the cosmic psyche, during the TM technique. Calmness, which arises from feeling connected to oneself, expresses the self-referral quality of the cosmic psyche. Improved health is a reflection of greater self-sufficient functioning of the physiology (see the following section), while heightened clarity indicates increased dynamism in the mind. The growth of all three qualities in this subject's report again indicates the interrelationship between them.

Example 4: Male, 24, filmmaker, 19 months

My perception just seems to become deeper and more positive all the time. There just are not any problems any more in relating with other people. When I go home and meditate now I have the energy to enjoy the evening with my family, to read, think, or otherwise grow in my chosen direction. Furthermore, nothing is really hard any more. At work or at home, when something comes up, I figure out what the desired results are, how to accomplish them, and then take the necessary action.

This subject clearly expresses qualities of growing infinite dynamism. Through the self-referral practice of the Transcendental Meditation technique, he has gained increased energy in both mind and body. Consequently he cites instances in all areas of his life where he is more capable of relating to his world in a successful manner. As with each example, however, even though one quality may be highlighted more than another, all three are present. Thus, his concluding statement indicates growing self-sufficiency in his ability to decide how to fulfill his desires efficiently.

Example 5: Female, 22, student, 21 months

I started meditating and I very shortly started feeling stronger and knowing myself a lot more. I started relating to people more and pretty soon I was interested in hundreds of new things.

As this meditator began the self-referral process of the Transcendental Meditation technique, she reports feeling stronger (self-sufficiency), knowing herself more (self-referral), and relating to other people more and becoming interested in many new activities (dynamism).

Example 6: Male, 23, student, 31 months

Since TM it's been an entirely different existence for me. I have experienced a constant unfolding of new abilities, changing attitudes, more virtues than I could hope for. I've really gotten to like myself and the world I live in. My energy has been the most dramatic change. I was like a plant trying to exist in barren soil with minimal nourishment, transplanted to the best possible place and it rejoices and shoots up.

This person reports an experience of integrated growth through practicing the Transcendental Meditation technique, using an analogy that illustrates the single process of holistic development. He likens himself to a plant that finds such nourishment when transplanted to a "best possible place," the core of being within the cosmic psyche; this experience causes him to rejoice and grow. The rejoicing expresses that same happiness, calmness, and deeper appreciation of life that others have expressed, which is associated with the self-referral experience of Transcendental Meditation; but it particularly illustrates the growing dynamism he feels is provided in the experience of the cosmic psyche.

Example 7: Male, 21, student, 1 year

Before TM I was fed up with school, useless in practical matters, and overzealous in "mystical" matters. I was ready to emigrate to Canada and had little direction. Now I have become more practical and plan on finishing school, having a career, and devoting time to helping others start meditating. I now understand better what place practical matters have, and also school is much easier. My mind is sharper and I am much more satisfied with the real, harmless pleasures of life like a nice day, pleasant friends, etc., and have little desire for too many frivolities or harmful pleasures like drugs, etc. In the future I expect all this to increase, I expect that I will be able to become socially, financially, and physically near perfect and able to devote much time to helping others.

This final example reflects how the more grounded, stable quality of self-referral that was missing in this student's life has been provided through his practice of the Transcendental Meditation technique. This more grounded feeling has given him the dynamism to function in the world in a more directed, practical, and productive manner. Concordantly, his satisfaction with the simple pleasures of life expresses the growing self-sufficiency that comes from greater inner happiness, contentment, and appreciation of the more subtle values of life.

These experiences are representative of those of the more than three million individuals who have learned the Transcendental Meditation program. They illustrate how a practice designed to allow direct experience of the unmanifest cosmic psyche results in experiences that express its fundamental qualities. In the same way that analysis of descriptions of nature from the scientific disciplines reveals these fundamental properties at work, analysis of self-reports by subjects practicing the TM technique reveals experiences in which these qualities of self-referral, self-sufficiency, and infinite dynamism can easily be located. This analysis illustrates Maharishi's assertion that the qualities of the cosmic psyche grow in one's life through the regular experience of pure consciousness. Substantiating these qualities, however, is not limited to analysis of subjective data only. As will be demonstrated in the concluding section of this article, analysis of the extensive objective research on subjects practicing the Transcendental Meditation and TM-Sidhi programs also reveals

the spontaneous growth of self-referral, self-sufficiency, and infinite dynamism in their lives.

Scientific Research

This section presents a "conceptual meta-analysis" of the published research and some of the doctoral dissertations and master's theses on the TM and TM-Sidhi programs, showing how the research results indicate the growth of self-referral, self-sufficiency, and infinite dynamism in different areas of life—physiological, psychological, sociological, and ecological (see the Appendix for a complete listing of this research). This analysis gives objective verification of the subjective reports presented in the previous section. However, it extends the range and precision with which these three fundamental qualities are seen to grow through practice of the Transcendental Meditation and TM-Sidhi programs. The section will analyze the growth of these three qualities in individual physiology and psychology, and extend this analysis to research that indicates their growth in sociological and ecological contexts. Because these three qualities are different aspects of the same thing, all three can be located in each research result. Thus, in some instances, the reader will find the same study cited for all three.

Physiological, psychological, and sociological self-referral. As was discussed earlier in the context of physiology, self-referral means the referencing of all the parts of a physiological system back to the wholeness of the system through feedback loops, so that the activity of each part is regulated with respect to the need of the organism as a whole. Numerous studies on the TM and TM-Sidhi programs have revealed this quality of physiological self-referral. For example, improved regulatory ability of the system as a whole during the TM technique is indicated by the achievement of a state in which the system is at rest but all the parts of the system are highly integrated (e.g., Wallace, 1970; Wallace et al., 1971, 1972). During this state, the regulatory ability in the central nervous system is improved, as indicated by increases in alpha and theta EEG coherence among frontal and central areas of the brain (e.g., Levine, 1976; Travis & Orme-Johnson, 1988). Increased EEG coherence in these frequencies and brain areas can be interpreted as reflecting increased functional integration—that is, integration between the parts and the whole—because it is correlated with greater creativity (Orme-Johnson & Haynes, 1981), flexibility of concept learning (Dillbeck, Orme-Johnson, & Wallace, 1981), neurological efficiency (Wallace, Mills, Orme-Johnson, Dillbeck, & Jacobe, 1982), and high levels of principled moral reasoning and intelligence (Orme-Johnson & Haynes, 1981; S. Nidich, Ryncarz, Abrams, Orme-Johnson, & Wallace, 1983). Improved physiological self-referral is also indicated by improved regulatory ability in the autonomic nervous system (e.g., Orme-Johnson, 1973; Dillbeck & Orme-Johnson, 1987b), endocrine system (e.g., Werner et al., 1986), and the system as a whole as indicated by general

improvement in health (e.g., Orme-Johnson, 1987b).

Psychological self-referral is seen as increased maintenance of the self-referral state of transcendental consciousness throughout the cycle of waking, dreaming, and sleep, an experience that provides a stable internal reference and integrating center for all psychological processes. Prior to the onset of enlightenment in the 5th state of consciousness (cosmic consciousness), memory serves as the integrating center for behavior. Memories of learned responses arise in different situations which structure behaviors that are adaptive in those situations. Such memories, however, are of limited generality. One must remember different things in order to behave effectively under different conditions. By contrast, the self-referral state of consciousness is memory of the cosmic psyche, the total potential of natural law—the one thing that is able spontaneously to organize the most adaptive possible behavior in any situation. It is memory of the completely general level of natural law. In Maharishi's Vedic Science, memory of pure consciousness is called *smriti* (Maharishi Mahesh Yogi, 1985). *Smriti* is not an intellectual remembrance of the cosmic psyche; it is awareness of pure consciousness arising from highly refined styles of physiological functioning that give rise to the stabilized states of enlightenment—the 5th, 6th, and 7th states of consciousness. Thus, as enlightenment grows, memory of pure consciousness replaces memory of specifics as the stable internal frame of reference that guides life.

Research on the TM and TM-Sidhi programs has revealed increased values of psychological self-referral throughout all expressed levels of the mind—senses, mind, intellect, and ego (see Appendix; Dillbeck, in press). Increased self-referral is indicated perceptually, for example, by increased field independence (e.g., Dillbeck, Assimakis, Raimondi, Orme-Johnson, & Rowe, 1986; Gelderloos, Lockie, & Chuttoorgoon, 1987; Pelletier, 1974), which is interpreted in the literature as indicating growth of a stable internal frame of reference. On the level of mind, memory and cognition become increasingly independent of habitual patterns (e.g., Alexander et al., in press; Dillbeck, 1982). Although memory improves, the individual is less rigidly bound by it because of the growing awareness of pure consciousness as the absolute stable internal frame of reference.

Self-referral is indicated on the level of intellect by increased fluid intelligence (e.g., Dillbeck et al., 1986; Tjoa, 1975), indicating increased ability of the intellect to deal with novelty. Fluid intelligence is self-referral because it represents the ability of the intellect to connect specific challenges from the environment with the wholeness of the individual's well-being and evolution. Furthermore, experiences of pure consciousness have been found to increase the synthetic and integrating functions of the personality as a whole; this increasing integration, seen as enhanced ego development, further indicates the growth of psychological self-referral, referral of the individual ego to the cosmic Self at its basis (Alexander, 1982; also see indications of growing cosmic

consciousness in the third article in this series). This finding that the quality of self-referral spontaneously grows at all levels of the mind supports the theory of Maharishis Vedic Psychology that the cosmic psyche is the basis of the mind (see Psychology Unified Field Chart, in the introduction to this series—Orme-Johnson, 1988, Figure 1, in this issue).

The ideal of sociological self-referral is the Golden Rule—"Do unto others as you would have others do unto you." If the cosmic psyche is the unified source of creation, then all members of society are connected at their deepest level, pure consciousness. Sociological self-referral is indicated when the interests of the individual are spontaneously integrated with the interests of others and of the society at large. Studies reporting increased social maturity in TM meditators (e.g., A. Aron, Orme-Johnson, & Brubaker, 1981), greater consideration of others (e.g., Penner, Zingle, Dyck, & Truch, 1974), decreased tendency to dominate (e.g., Handmacher, 1978) and greater respect for traditional religious values and greater altruism (e.g., Hanley & Spates, 1978) are examples of research on the Transcendental Meditation and TM-Sidhi programs that reveal growing sociological self-referral. Research on the basic sociological unit, marriage, has also indicated increased self-referral, as evidenced by greater acceptance of one's spouse, greater agreement on conduct and recreation, and greater intimacy and happiness in subjects practicing the TM and TM-Sidhi programs (e.g., E.N. Aron & A. Aron, 1982; Chen, 1985; Suarez, 1976).

Increased sociological self-referral can also be seen in research on education that indicates higher levels of moral reasoning in meditating college students (e.g., S. Nidich, R. Nidich, & Rainforth, 1986) and higher levels of moral atmosphere in a high school setting where all of the students practice the TM technique (R. Nidich & S. Nidich, 1985). Research has also documented changes indicating increased self-referral in business, as revealed by increased ability to cooperate with others (e.g., Jonsson, 1975) and improved relations with co-workers and supervisors (e.g., Alexander, Swanson, Rainforth, Carlisle, & Todd, 1987).

A broad range of scientific research can thus be interpreted as indicating increased self-referral through the TM and TM-Sidhi programs. This interpretation supports the basic premise of Maharishis Vedic Psychology that pure consciousness, the cosmic psyche, is the common basis of all physiological, psychological, and sociological processes. It shows that regular experience of pure consciousness through daily practice of the TM and TM-Sidhi programs enlivens the connection of all levels of individual life with their basis, and enhances all the variations of self-referral processes that uphold the diverse phases of living in one unbroken wholeness of life in accord with natural law.

Physiological, psychological and sociological self-sufficiency. Physiological self-sufficiency means the ability to maintain a healthy, balanced style of physiological functioning with reduced and even eliminated need for external interventions such as drugs and medical care. Research on

individuals practicing the Transcendental Meditation and TM-Sidhi program has verified increased physiological self-sufficiency, as indicated by improved health of the immune system (e.g., Farinelli, 1981), decreased need for medicines and non-prescribed drugs (e.g., Brooks & Scarano, 1985), better health for mother and child during pregnancy and childbirth (e.g., Heidelberg, 1979), decreased medical care utilization in all categories of disease (e.g., Orme-Johnson, 1987b), and increased longevity, health, and self-sufficiency for the elderly practicing the TM technique (e.g., Alexander, Langer, Davies, Chandler, & Newman, 1986).

Psychological self-sufficiency means the ability to maintain a confident, balanced, happy, productive frame of mind capable of providing for one's own needs without dependence on others. Maharishis Vedic Psychology predicts that experience of the cosmic psyche through regular practice of the TM and TM-Sidhi programs spontaneously increases psychological self-sufficiency. This prediction has found confirmation in a wide range of psychological research on every level of the mind—senses, memory and cognition, intellect, and ego (see Appendix). For example, increased field independence found in TM meditators (e.g., Pelletier, 1974), indicates the ability to perceive target stimuli without being distracted by background fields designed to disguise the target and create confusion. Individuals who are more field independent, as measured by perceptual tests (rod and frame test, embedded figures test), are also found to be more self-sufficient in their thinking (Goodenough, 1976), as well as more resistant to both persuasion by others and being influenced to go against their judgment (Witkin & Goodenough, 1977). Dillbeck's (1982) doctoral dissertation at Purdue was specifically designed to measure cognitive self-sufficiency. In one part of the experiment, playing cards were flashed to subjects for fractions of a second and the subject had to identify the card. To test the subject's self-sufficiency and flexibility of mind, some of the cards were printed with the wrong color. For example, a king of clubs might be printed in red ink instead of black. Rigid adherence to the old habit of thinking of clubs as always black would hinder correct identification of the card. Dillbeck found that subjects who began the TM program improved in ability to identify the test cards compared to control subjects, indicating increased freedom from habitual pattern recognition.

Another indication of psychological self-sufficiency is creativity—the ability to generate new ideas. The practice of the TM technique has been found to increase the originality, flexibility and fluency of creative thought (e.g., Travis, 1979). Growing psychological self-sufficiency is also indicated by increased ability to use the intellect effectively in novel situations, as indicated by increased fluid intelligence (e.g., Dillbeck et al., 1986) and increased inner-directedness, a measure of the individual's willingness to take responsibility for his or her own actions (e.g., S. Nidich, Seeman, & Dreskin, 1973).

Sociological self-sufficiency can be seen when all sectors of society are

composed of self-sufficient individuals and groups that give the society as a whole the internal strength to progress by itself. Improved sociological self-sufficiency reflects Maharishi's principle that practice of the Transcendental Meditation and TM-Sidhi programs increases alliance with natural law because the cosmic psyche is the source of all the laws of nature.

"Total advancement of the nation means everything in the fulfilling direction, everything aimed at raising self-sufficiency and self-reliance in the nation. This will come through alliance with natural law" (Maharishi Mahesh Yogi, 1986, p. 127). Maharishi (1986) further explains that alliance with natural law develops through the practice of the TM and TM-Sidhi program, and delineates the value of this practice in growing self-sufficiency for the nation:

The most precious resource of any nation is the human brain physiology. Train [the mind] to function cosmically and inherit the cosmic functioning of the unified field in order that every human brain is as creative as it can be. The whole nation will rise in productivity, creativity, and self-sufficiency. (pp. 127-128)

Research on groups of individuals practicing the Transcendental Meditation and TM-Sidhi programs verifies increased sociological self-sufficiency, as indicated, for example, by decreased drug abuse (e.g., Shafii, Lavelly, & Jaffe, 1974), decreased need for tranquilizers and other prescribed drugs (e.g., Monahan, 1977), decreased dropout from school (e.g., Jackson, 1977), increased employment status in patients with post-Vietnam adjustment problems (Brooks & Scarano, 1985), fewer sick days in workers (e.g., Alexander, Swanson, Rainforth, Carlisle, & Todd, 1987), and decreased recidivism in released prisoners (Bleick & Abrams, 1987).

Physiological, psychological and sociological infinite dynamism. The quality of infinite dynamism of the cosmic psyche is expressed in the physiology as increased energy and dynamism. This result has been confirmed by numerous studies. Research indicates more dynamic brain functioning through the TM and TM-Sidhi program, as measured by shorter latencies of cortical evoked potentials, which in turn indicate faster reaction of the brain to stimulation (e.g., Kopal, Wandhofer, & Plattig, 1975). Increased dynamism of different areas of the nervous system is also indicated by a number of other measures including shorter simple and choice reaction times (e.g., Holt, Caruso, & Riley, 1978; Banquet & Lesevre, 1980), decreased reflex latency and reflex motor time (Warshal, 1980), enhanced H-reflex recovery (Wallace, Mills, Orme-Johnson, Dillbeck, & Jacobe, 1983), and faster habituation of the electrodermal response to stress (e.g., Orme-Johnson, 1973).

High EEG coherence has been interpreted as indicating increased information flow in the brain (e.g., Sheppard, 1988). EEG coherence increases globally among all brain areas measured during subjective reports of experiences of transcendental consciousness (e.g., Badawi,

Wallace, Orme-Johnson, & Rouzeré, 1984). This result suggests that information flow among brain areas increases during experiences of pure consciousness. That this flow of information results in increased dynamism is indicated by the finding that EEG coherence in those practicing the TM and TM-Sidhi programs is correlated with various indices of dynamism, including neurological efficiency and high levels of creativity, flexibility of concept learning, and intelligence (e.g., Orme-Johnson & Haynes, 1981). These results support the hypothesis that experiences of pure consciousness improve communication between the parts of the system and the wholeness of the system, thus increasing dynamism.

Perhaps the greatest single proof of increased physiological dynamism is in the effect of the TM and TM-Sidhi programs on slowing biological aging (e.g., Wallace, Dillbeck, Jacobe, & Harrington, 1982). Most physical functions, such as blood pressure, near point vision, and hearing, decline with advancing age. Several studies have found that meditators have a younger biological age. One experiment randomly assigned elderly subjects in their 80's to either the TM program, a control group, or one of two other programs with similar expectation-fostering features. Alexander, Langer, Davies, Chandler, & Newman (1986) found that the TM group exhibited lower blood pressure, increased in cognitive flexibility, and lived longer than controls.

Infinite dynamism is expressed psychologically when all levels of the mind are connected in a more lively manner with their source, pure consciousness. Research on the TM and TM-Sidhi programs indicates increased expression of infinite dynamism in all levels of the mind (see Appendix). For example, meditators make fewer mistakes on perceptual tasks (e.g., Banquet & Lesèvre, 1980), perform faster on choice reaction time, a correlate of general intelligence (e.g., Cranson, 1988), show enhanced tonal memory (Pagano & Frumkin, 1977), increased learning ability (e.g., S. Nidich et al., 1986), greater adaptability of mental orientation (e.g., Penner et al., 1974), and increased ability to live more fully in the present and to connect the past and future meaningfully (e.g., Hjelle, 1974).

Sociological infinite dynamism is evidenced when sectors of society display energy and vigor while maintaining integration between the individual and society as a whole. Maharishis Vedic Psychology posits pure consciousness as a field of infinite correlation at the basis of individual and collective consciousness. It also predicts that enlivening pure consciousness in the individual awareness through the TM and TM-Sidhi programs provides the integrative basis upon which consensus can be reached and harmonious and effective social action undertaken that responds quickly to perceived needs and steadily progresses towards fulfilling society's chosen goals.

Research on the Transcendental Meditation and TM-Sidhi programs has shown increased dynamism as a general trait in meditators participating in groups—as indicated, for example, by a greater sense of social responsibility (e.g., A. Aron et al., 1981); increased outgoingness and tendency to participate (e.g., Thrall, 1978); increased sociability (e.g.,

Hanley & Spates, 1978); growth of a more sympathetic, helpful, and caring nature; increased ability to be objective and fair minded (e.g., Marcus, 1977); and increased good humor (e.g., Geisler, 1978). The growth of infinite dynamism in marriage is shown in greater agreement on conduct and recreation, and greater intimacy and happiness (Suarez, 1976). In business it is seen, for example, as greater ability to assign priorities, greater decision-making ability (e.g., Jonsson, 1975) and increased efficiency and productivity (e.g., Alexander, Abou Nader et al., 1987; Frew, 1974). Meditating students show greater optimism (e.g., Brown, 1976/1977) and greater social extroversion and interest in academic activities (e.g., Penner et al., 1974); these changes also objectively confirm the growth of sociological dynamism through practice of the Transcendental Meditation and TM-Sidhi programs.

Ecological self-referral, self-sufficiency, and infinite dynamism. The growth of the qualities of self-referral, self-sufficiency, and infinite dynamism in the ecology is documented by research on the influence of the Transcendental Meditation and TM-Sidhi programs on collective consciousness. This research is classified under "ecology" because it deals with the system as a whole in the broadest terms, albeit in a novel way—that is, through its collective consciousness. All of the published research on the TM and TM-Sidhi programs in this area is on measures of human quality of life, such as rates of crime, hospital admissions, traffic fatalities, and so forth, including measures of pollution in some studies. Since the balance or imbalance of the ecology is almost entirely the result of human actions, this research is highly significant for the ecology as well as for human society. Maharishi has noted how human life and the larger ecology are interconnected on every level of natural law:

Imbalance in nature merely means lack of co-ordination among its various separate elements....Through the TM technique what happens is that the brain becomes more coherent in its functioning—the different parts of the brain begin to function respecting one another. On the collective level communication becomes smooth and fruitful among the various parts that build up a nation, as well as among the various elements that make up the parts.

All relationships become healthy and happy. When the value of infinite correlation is fully available, then everything functions as if nature had organized all the separate values of creation into one wholeness of purpose....When the value of infinite correlation is not enlivened, then it is as if correlation were frozen. Inertia reigns. Communication is frozen and there is lack of co-ordination. The result is chaotic happenings and imbalance in nature. (Maharishi Mahesh Yogi, 1978, pp. 184-185)

By "balance in nature," Maharishi means that human society supports the health and balance of the ecology, and reciprocally, the ecology supports human life, with seasons coming in time, plentiful rain, and abundant crops—life lived in tune with nature to the highest degree. The concept that nature responds to human actions in a favorable or unfavorable way is ancient wisdom embedded in almost every culture. Until now, however, it has not made its way into science because no scientific response to human life. With the understanding of a unified source of

creation that can be enlivened in nature and in collective consciousness through the experience of transcendental consciousness, there is now a scientific and technological means to deal with the ecology as a whole and to create an ideal relationship between nature and human life.

Thus, from the perspective of Maharishis Vedic Psychology, it is possible to extend the analysis of the growth of the fundamental qualities of the cosmic psyche beyond the lives of individual meditators to the ecosystem as a whole. On the level of ecology, self-referral means that every aspect of the ecosystem is well connected to its source, the source of all the laws of nature, the cosmic psyche. This connectedness results in balance in nature. Changes in the human ecology, such as decreased war, less civil violence, less pollution, and a more balanced economy, all indicate the growth of balance, which in turn influences the balance of the larger ecology. Ecological self-sufficiency means that the entire ecosystem maintains this balance without the need for external intervention to correct it. Spontaneous reductions in war, crime, unemployment, etc., all indicate reduced need for external intervention to correct the imbalances underlying these problems. The quality of infinite dynamism is seen in the ecology when all aspects of the ecosystem are functioning in a lively and dynamic way. Indications of improved health in the human ecology reflect increased dynamism that also extends to the larger ecology.

Research on the TM and TM-Sidhi programs confirms the growth of ecological self-referral, self-sufficiency, and infinite dynamism on the city level, as indicated by an immediate drop in crime rate in cities and a reduction in crime trend when 1% of the population participates in the TM program (e.g., Dillbeck, Landrith, & Orme-Johnson, 1981; Dillbeck, Cavanaugh, Glenn, Orme-Johnson, & Mittlefehldt, 1987). In addition, time series analysis methodology has been used to detect improvement on a composite index of quality of life, including crime, fires, and auto accidents in a city, through the group practice of the TM-Sidhi program (e.g., Orme-Johnson, Alexander, Davies, Chandler, & Larimore, in press).

Research also indicates increased self-referral, self-sufficiency, and infinite dynamism at the state level, as demonstrated by improved quality of life on a composite index—crime rate, motor vehicle fatalities, auto accidents, deaths, alcoholic beverages and cigarette consumption, unemployment, and pollution—when the number of participants practicing the TM and TM-Sidhi program in a group exceeds the square root of 1% of the population (Dillbeck et al., 1987). This effect has also been documented at the national level as decreased rates of unemployment and inflation (e.g., Cavanaugh, 1987) and as decreases in war deaths, war intensity, crime, and improved national mood (e.g., Orme-Johnson, Alexander, Davies, Chandler, & Larimore, in press). On the global level, decreased war deaths, casualties, and war intensity, and increased cooperation were found in a major international conflict (Lebanon) during seven experimental periods in which the number of participants practicing the TM and TM-Sidhi programs in a group was large enough to have the

predicted impact (e.g., Davies, 1988). These experimental periods included three large international assemblies in which the number of TM and TM-Sidhi participants approached or exceeded the square root of 1% of the world population (7000).

The holistic, beneficial effects of individual and group practice of the TM and TM-Sidhi programs on all levels of the human ecology have been named the Maharishi Effect in honor of Maharishi, who predicted this effect and provided the technology that made its realization possible (Borland & Landrith, 1976; see Orme-Johnson & Dillbeck, 1987, for a review).

Summary and Conclusion

This article has provided evidence from both subjective and objective approaches to knowledge, supporting the view of Maharishi's Vedic Psychology that the cosmic psyche is the unified source of the diversity of nature. It was seen that Maharishi's description of self-referral, self-sufficiency, and infinite dynamism as primary qualities of the cosmic psyche is also present in descriptions of the cosmic psyche from the Vedic literature. Self-referral, self-sufficiency, and infinite dynamism were also seen to be familiar aspects of waking-state consciousness manifesting themselves in many facets of everyday experience, including the growth of self-knowledge, self-sufficiency, and appreciation of whole-part relations as the individual psyche matures in the values of the cosmic psyche.

In addition, these same qualities were found to be central to the deepest and most universal principles of each of the scientific disciplines. Unified field theories in physics, set theory in mathematics, the role of DNA in physiology, and the theory of the transition state in chemical kinetics can each be understood as describing a field of the total potential of natural law that organizes all structures and functions within their respective domains of nature. From the perspective of Maharishi's Vedic Psychology, a remarkable feature of these unified expressions of natural law is that they exhibit the properties of consciousness—self-referral, self-sufficiency, and infinite dynamism. These scientific expressions of the unified field therefore can be interpreted as reflecting the cosmic psyche on their respective levels of creation.

We further saw in personal experiences of participants in the Transcendental Meditation program, the technology for directly experiencing the cosmic psyche, how expressions of self-referral, self-sufficiency, and infinite dynamism increase in many phases of life. These subjective reports were objectively verified in a review of empirical research that provides a wide range of evidence that self-referral, self-sufficiency, and infinite dynamism do indeed increase in the physiology, psychology, sociology, and ecology, as a result of practicing the TM and TM-Sidhi programs.

Thus it can be seen from a number of viewpoints—intellectual understanding, basic principles of science, direct experience, and scientific

research—that the qualities of the cosmic psyche as described by Maharishi's Vedic Psychology clearly account for how the mind and nature work, supporting the view that the cosmic psyche is the unity underlying the diversity of both. The personal experiences of participants in the TM and TM-Sidhi programs, the explanation of these experiences, and the research on them all point to the same conclusion: The self-referral state of human consciousness is the self-referral state of nature's functioning—pure consciousness, the cosmic psyche.

The first principle of Maharishi's Vedic Psychology, then, must be that the highest priority of the scientist (or indeed anyone) is to raise his or her own consciousness to the level of the cosmic psyche in the completely self-referral state of unity consciousness. All the scientific research and personal experiences taken together indicate that this reality of unity underlying the diversity of life begins to dawn from the very first day that the mind begins turning inward during the TM technique to fathom its own source—pure consciousness. None of the individual changes shown by the scientific research really captures the holistic nature of the subtle yet all-pervasive improvement in every phase of life that takes place when one begins the practice of TM and TM-Sidhi programs.

Furthermore, Maharishi warns that we gain only limited verification by locating the properties of the cosmic psyche in scientific descriptions of nature or scientific research. "It is difficult to comprehend Its [the cosmic psyche's] full nature by mere intellectual process. It needs a direct experience for the abstract Reality to be properly understood" (Maharishi Mahesh Yogi, 1969, p. 106). From the perspective of Maharishi's Vedic Psychology, while verification of the reality of the cosmic psyche begins with initial experiences of pure consciousness, it is not complete until the individual reaches the pinnacle of the evolution of consciousness. As will be fully explained in the third article in this series, Maharishi terms this pinnacle unity consciousness, the state in which everything is directly perceived to be an expression of the cosmic psyche. Thus, appreciation of the reality of the cosmic psyche develops as consciousness evolves, through personal experience and intellectual analysis. Until the final verification is reached, however, the principles of Maharishi's Vedic Psychology need not be taken on faith. They can be taken as theory to be tested by many different criteria. The body of knowledge presented in this and subsequent articles on Vedic Psychology represents the current level of development in an ongoing program of research into the fundamental role of the cosmic psyche in the universe.

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Appendix

Research on the Transcendental Meditation and TM-Sidhi Programs Reflecting the Growth of Self-Referral, Self-Sufficiency, and Infinite Dynamism

In addition to publication in the original source, the research cited in this appendix has been collected in five volumes: *Scientific Research on the Transcendental Meditation and TM-Sidhi program, Collected papers*, Orme-Johnson and Farrow (Eds.), (1976), Vol. 1; Chalmers, Clements, Schenkluhn, and Weinless (Eds.), (in press), Vols. 2-4; and Maharishi International University (in press), Vol. 5.

Self-Referral

Physiological Self-Referral

Through the Transcendental Meditation and TM-Sidhi programs, direct experience of the cosmic psyche increases physiological self-referral—improved regulation of the parts of the system with the wholeness of the system. When consciousness is non-self-referral, attention is directed outward and the physiology adjusts accordingly to meet the demands of activity. During the practice of the TM program, attention is directed inward as consciousness settles into its self-referral state. The physiology correspondingly settles into a state of low activation and high integration—*restful alertness*—as indicated by:

- decreased metabolic rate (Farrell, 1979; Gamier, Cazabat, Thebault, & Gauge, 1984; Wallace, 1970; Wallace et al., 1971; Wallace et al., 1972).
- decreased glucose metabolism in red blood cells (Jevning, Wilson, Pirkle, Guich, & Walsh, 1985).
- decreased respiration rate and minute ventilation (Wallace, 1970; Wallace et al., 1971; Wallace et al., 1972).
- decreased breath rate and respiratory quotient, respiratory suspension, and hypo-ventilation; changed sensitivity to blood gases (Kesterson, 1986).
- physiological indications of higher states of consciousness (respiratory suspension, slowing of respiratory frequency, drop in expiratory exchange) correlated with psychological health (Gelderloos, 1987).
- deep relaxation as indicated by increased basal skin resistance (Wallace, 1970; Wallace et al., 1971; Wallace et al., 1972; Orme-Johnson, 1973; see Dillbeck & Orme-Johnson, 1987, for a review).
- redistribution of blood flow and increased cerebral blood flow (Jevning & Wilson, 1978; Jevning, Smith, Wilson, & Morton, 1976; Jevning, Wilson, Smith, & Morton, 1978; Jevning, Wilson, O'Halloran, & Walsh, 1983).
- decreased plasma Cortisol (Bevan, 1980; Jevning, Wilson, & Davidson, 1978; Jevning, Wilson, & Smith, 1978).
- increased serotonin metabolite (5-HIAA) (Bujatti & Riederer, 1976).
- increased EEG synchrony and correlation (Banquet, 1972, 1973; Banquet & Sailhan, 1974; Hebert & Lehmann, 1977; Krahné & Taneli, 1975).
- increased EEG coherence (Levine, 1976; Gaylord, Orme-Johnson, & Travis, 1988; Gaylord, Orme-Johnson, Willbanks, & Travis, 1988; Travis, 1988b).

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- unique physiological states as indicated by biochemical changes (Jevning, Wells, Wilson, & Guich, 1987; Jevning, Pirkle, & Wilson, 1977; Jevning, Wilson, & Vanderlaan, 1978; McCuaig, 1974; O'Halloran, Jevning, Wilson, Skowsky, & Alexander, 1985).

During periods of transcendental consciousness—the state of perfect self-referral that occurs during the TM technique—increased physiological self-referral is indicated by:

- respiratory suspension (Farrow & Hebert, 1982; Badawi, Wallace, Orme-Johnson, & Rouzere, 1984; Kesterson, 1986; Travis, 1988b; Wolkove, Kreisman, Darragh, Cohen, & Frank, 1984).
- increased EEG coherence (Farrow & Hebert, 1982; Badawi et al., 1984; Travis, 1988b).

During the practice of the TM-Sidhi program, increased physiological self-referral is indicated by:

- increased EEG coherence at the moment of lift-off in Yogic Flying (Orme-Johnson, Clements, Haynes, & Badawi, 1977; Travis, 1988b).
- maintenance of alpha rhythm, an indication of restful alertness, during Yogic Flying (Orme-Johnson & Gelderloos, 1988).
- distinctive EEG feature of .5 Hz decrease in peak power and higher coherence (theta) during Yogic Flying (Travis, 1988b).

Increased physiological self-referral *outside* the practice of the TM and TM-Sidhi programs is indicated by:

1. improved regulatory ability of the central nervous system:

- improved information transfer in the brain (Kobal, Wandhofer, & Plattig, 1975; Wandhofer, Kobal, & Plattig, 1976).
- greater adaptability of brain functioning (greater lateralization appropriate to right or left hemisphere task) (Bennett & Trindler, 1977).
- improved left hemisphere functioning—improved verbal and analytic thinking (Schecter, 1975; Tjoa, 1975; Travis, 1979).
- improved right hemisphere functioning—improved synthetic and holistic thinking (Harrison, Pagano, & Warrenburg, 1976; Pagano & Frumkin, 1977; Travis, 1979).
- longitudinal increases in frontal EEG coherence (Dillbeck & Bronson, 1981), a correlate of:
 - greater creativity (Dillbeck & Vesely, 1986; Orme-Johnson & Haynes, 1981).
 - flexibility of concept learning (Dillbeck, Orme-Johnson, & Wallace, 1981; Dillbeck & Vesely, 1986).
 - neurological efficiency (Wallace, Mills, Orme-Johnson, Dillbeck, & Jacobe, 1982).
 - high levels of principled moral reasoning and intelligence (Hernandez, 1988; S. Nidich, Ryncarz, Abrams, Orme-Johnson, & Wallace, 1983; Orme-Johnson, Wallace, Dillbeck, Alexander, & Ball, 1982).
 - better utilization of subtle cues—enhanced semantic facilitation (Sheppard, 1988).
- faster H-reflex recovery (Wallace, Silver, Mills, Dillbeck, & Wagoner, 1983), a correlate of academic achievement (Wallace, Orme-Johnson, Mills, & Dillbeck, 1984), EEG coherence, and concept learning (Dillbeck, Orme-Johnson, & Wallace, 1981).

2. improved autonomic regulation:

- increased autonomic stability (Dillbeck & Orme-Johnson, 1987; Orme-Johnson, 1973).

- lower resting metabolic rate (Gamier et al., 1984).
 - lower resting heart rate (see Dillbeck & Orme-Johnson, 1987, for a review),
 - lower resting respiration rate (Allison, 1970; Wallace, 1970; Wallace et al., 1971, 1972; see Dillbeck & Orme-Johnson, 1987, for a review).
 - electromyographic evidence of deep muscle relaxation (Kemmerling, 1978).
 - longitudinal indications of deep relaxation—decreased heart rate, decreased systolic and diastolic blood pressure, decreased amplitude of radial and carotid pulse, decreased EMG, increased basal skin resistance (Bagga & Gandhi, 1983).
 - reduced blood pressure in hypertensive patients (Blackwell et al., 1975; Cooper & Aygen, 1978; Doner, 1976; Alexander, Langer, Davies, Chandler, & Newman, 1986).
 - reduction of blood pressure to more ideal level in normotensive subjects (Cooper & Aygen, 1978; Wallace et al., 1983).
 - reduced airway resistance in bronchial asthma patients (Honsberger & Wilson, 1973a, 1973b; Wilson, Honsberger, Chiu, & Novey, 1975).
 - normalization of reactivity to stress indicated by reduced cardiovascular reactivity under acute mental and physiological stress, lower levels of epinephrine, and reduced beta-adrenergic receptor sensitivity (Mills, Schneider, Hill, Watson, & Wallace, 1987).
3. improved biochemical regulation:
- increased stability and sensitivity of control of hormone levels (Werner et al., 1986).
 - decreased biochemical stress markers.
 - lower urinary free Cortisol (Bevan, Young, Welby, Nenadovich, & Dickens, 1976).
 - lower plasma lactate (Wallace et al., 1971, 1972; Jevning, Wilson, Smith, & Morton, 1978; Jevning, Wilson, O'Halloran, & Walsh, 1983; Jevning, Wilson, Pirkle, O'Halloran, & Walsh, 1983; see Dillbeck & Orme-Johnson, 1987, for a review).
 - decreased serum cholesterol levels in normal and hypercholesterolemic patients (Cooper & Aygen, 1978, 1979).
 - improved glucose tolerance (Tabogi, 1983).
 - increased serotonin metabolite (Bujatti & Riederer, 1976; Walton, Lerom, Salerno, & Wallace, 1981; Walton, Francis, Lerom, & Tourenne, 1983; Walton et al., 1987).
 - normalization of neurotransmitter metabolites in patients with aggressive behavior, mental retardation, and epilepsy (Subrahmanyam & Porkodi, 1980).
 - normalization of biochemical rhythms—altered periodicity of metabolic turnover of 5-hydroxyindoles (Walton et al., 1983).
 - changes in excretion of neuroactive "substance M" (Walton et al., 1987).
 - reduced physiological correlate (luteinizing hormone) of type A coronary prone behavior (Schneider, Mills, Schramm, & Wallace, 1987).
4. improved regulation of the entire physiology as indicated by improved general health (Farinelli, 1981; Orme-Johnson, 1987b; Overbeck, 1982).
5. increased physiological self-referral in subjects at a distance from those subjects practicing the TM and TM-Sidhi program:
- increased serotonin metabolite (5-HIAA) correlated with increased size of group practice of TM and TM-Sidhi programs at a distance from the subjects (Pugh, Walton, & Cavanaugh, 1988).
 - increased EEG coherence produced by other individuals practicing Yogic Flying at a distance (Orme-Johnson, Dillbeck, Wallace, & Landrith, 1982; Travis, 1988a, 1988b).

These physiological changes find expression in psychological changes.

Psychological Self-Referral

Through the regular practice of the Transcendental Meditation and TM-Sidhi program, direct experience of the cosmic psyche (the Self) at the basis of the mind increases the integration of all aspects of mental activity with the Self (e.g., Dillbeck, 1983), as indicated by:

1. increased self-referral on measures of perception and motor skills:
 - growth of a stable internal frame of reference as indicated by tests of field independence (Dillbeck, Assimakis, Raimondi, Orme-Johnson, & Rowe, 1986; Gelderloos, Lockie, & Chuttooragoon, 1987; Jedrczak, 1984; Pelletier, 1974).
 - growth of a stable internal frame of reference as indicated by reduced need for external stimulation (Friend & Maliszewski, 1978).
 - growth of a stable internal frame of reference as indicated by improved efficiency of visual perception (Dillbeck, 1982).
 - improved mind-body coordination (Holt, Caruso, & Riley, 1978).
2. increased self-referral on measures of memory and cognition:
 - increased ability to remain anchored in the Self as the basis of improved spatial localization (Harrison et al., 1976; Pelletier, 1974).
 - improved holistic, synthetic thinking as indicated by enhanced tonal memory (Pagano & Frumkin, 1977), higher creativity (Jedrczak, Beresford, & Clements, 1985), and increased originality of figural creativity (Travis, 1979).
 - increased access to the Self, the source of language, as the basis of increased verbal fluency (Travis, 1979), and semantic facilitation (Sheppard, 1988).
3. increased self-referral on measures of intellectual ability:
 - ability to remain anchored in the Self while responding to novel situations, as indicated by increased fluid intelligence (A. Aron, Orme-Johnson, & Brubaker, 1981; Dillbeck, Assimakis et al., 1986; Jedrczak et al., 1985; Kotchabhakdi, Pipatveravat, Kotchabhakdi, Tapanya, & Pornpathkul, 1982; Tjoa, 1975), increased learning ability (Kotchabhakdi et al., 1982), increased moral reasoning (Kotchabhakdi et al., 1982; S. Nidich, 1975), and improved academic performance (Kember, 1985; S. Nidich, R. Nidich, & Rainforth, 1986).
4. increased self-referral on measures of the ego function:
 - increased self-actualization, self-esteem, self-regard, and feeling reactivity (sensitivity to one's own needs and feelings) (Berg & Mulder, 1976; Ferguson & Gowan, 1976; Hjelle, 1974; S. Nidich, Seeman, & Dreskin, 1973; Seeman, Nidich, & Banta, 1972).
 - greater inner locus of control (Hjelle, 1974).
 - enhanced self-concept (Nystul & Garde, 1977).
 - stronger self-identity (Turnbull & Norris, 1982).
 - increased level of ego development (Alexander et al., in press),
 - increased experiences of stabilization of pure consciousness (Alexander, Swanson, Rainforth, Carlisle, & Todd, 1987).
 - decreased anxiety and somatic neurotic instability (Dillbeck, 1977; Kniffki, 1979; Ljunggren, 1977; Tjoa, 1975).

These psychological changes find expression in sociological changes.

Sociological Self-Referral

Through the regular practice of the Transcendental Meditation and TM-Sidhi programs, direct experience of the cosmic psyche increases sociological self-referral—integration of all individuals and groups with the larger society—as indicated by:

1. general changes indicating increased sociological self-referral:
 - more positive conception of human nature, less pronounced feelings of social inadequacy, and higher levels of tolerance (Hanley & Spates, 1978).
 - increased social maturity (A. Aron et al., 1981; Geisler, 1978; Hanley & Spates, 1978; Penner, Zingle, Dyck, & Truch, 1974).
 - improved perception of others & improved ability to appreciate others (Holeman & Seiler, 1979).
 - increased consideration of others (Penner et al., 1974).
 - decreased tendency to dominate (Handmacher, 1978).
 - increased capacity for intimate contact (capacity for warm interpersonal relationships) (Hjelle, 1974; Geisler, 1978; S. Nidich et al., 1973; Seeman et al., 1972).
 - less interest in superficial social contacts (Handmacher, 1978).
 - greater respect for traditional religious values and greater altruism (Hanley & Spates, 1978; Penner et al., 1974).
2. changes indicating increased self-referral in education:
 - higher level of moral reasoning in college students (S. Nidich; 1975; S. Nidich et al., 1986; S. Nidich et al., 1983).
 - high level of moral atmosphere in a high school setting (R. Nidich & S. Nidich, 1985).
3. changes indicating increased self-referral in business:
 - lower tension on the job, reduced trait anxiety, decreased fatigue, and increased physiological relaxation (Alexander, Swanson, et al., 1987).
 - increased ability to cooperate with others (Jonsson, 1975).
 - improved relations with co-workers and supervisors, and improved personal and work relations (Alexander, Swanson et al., 1987; Frew, 1974).
 - increased job satisfaction (Alexander, Swanson et al., 1987; Frew, 1974).
4. changes indicating increased self-referral in marriage:
 - greater acceptance of one's spouse (Suarez, 1976).
 - greater agreement on conduct and recreation (Suarez, 1976).
 - greater admiration for one's spouse (Suarez, 1976).
 - greater adjustment (E.N. Aron & A. Aron, 1982; Suarez, 1976).
 - greater intimacy and happiness (Suarez, 1976).

These sociological changes find expression in ecological changes.

Ecological Self-Referral

Through the regular practice of the Transcendental Meditation and TM-Sidhi programs, direct experience of the cosmic psyche increases ecological self-referral—balanced integration of all aspects of the ecology with the system as a whole—as indicated by:

1. increased expression of self-referral in the ecosystem on the city level—increased balance in society:
 - an immediate drop in crime rate in U.S. cities and a reduction in crime trend when 1% of the population participates in the TM program (Borland & Landrith, 1976; Dillbeck, Landrith, & Orme-Johnson, 1981).
 - decreased crime rate in cities (Union Territory of Delhi and Metro Manila) during experimental periods in which the number of participants practicing the TM and TM-Sidhi program in a group exceeded the square root of 1% of the population (Dillbeck, Cavanaugh, Glenn, Orme-Johnson, & Mittlefehldt, 1987).
2. increased expression of self-referral in the ecosystem on the state level—increased holistic progress of society:
 - improved quality of life on the state level on a composite index—crime rate,

motor vehicle fatalities, auto accidents, deaths, alcoholic beverage and cigarette consumption, unemployment, pollution—when the number of participants practicing the TM and TM-Sidhi program in a group exceeded the square root of 1% of the population (Dillbeck, Cavanaugh et al., 1987).

3. increased expression of self-referral in the ecosystem on the national level—increased holistic progress of society:

- decreased inflation and unemployment in the U.S. and Canada when the number of participants practicing the TM and TM-Sidhi program in a group exceeded the square root of 1% of the national population (Cavanaugh, 1987).
- improved quality of life in the U.S. on a composite index—crime rate, notifiable disease rate, hospital admissions rate, infant mortality rate, suicide rate, cigarette consumption per capita, alcohol consumption per capita, GNP per capita, patent application rate, divorce rate, and traffic fatalities rate—when the number of participants practicing the TM and TM-Sidhi program in a group exceeded the square root of 1% of the national population, taking into account the number of TM meditators in the population (Orme-Johnson, Gelderloos, & Dillbeck, in press).
- improved quality of life in Israel—decreased crime, decreased traffic fatalities, decreased fires, improved national mood, and increased stock market—when the number of participants practicing the TM and TM-Sidhi program in a group exceeded the square root of 1% of the national population (Orme-Johnson, Alexander, Davies, Chandler, & Larimore, in press).

4. increased expression of self-referral in the ecosystem on the world level—increased peace and holistic progress in the world:

- decreased war intensity and fewer war deaths in Lebanon when the number of participants practicing the TM and TM-Sidhi program in a group exceeded the square root of 1% of the population of Israel and Lebanon, taking into account the number of TM meditators in the population (Orme-Johnson, Alexander, Davies, Chandler, & Larimore, in press).
- increased progress towards peace and reduced injuries and war deaths during three experimental periods in which the number of participants practicing the TM and TM-Sidhi program in a group exceeded the number predicted to be necessary to influence the war (Alexander, Abou Nader et al., 1987).
- decreased international conflicts and increased economic prosperity during three experimental periods in which the number of participants practicing the TM and TM-Sidhi program in a group approached or exceeded the square root of 1% of the world population (Orme-Johnson, 1987a, Dillbeck, 1987).
- improved U.S.-Soviet relations as a result of the group practice of the TM and TM-Sidhi program (Gelderloos, Frid, Goddard, Xue, & Loliger, in press).

Self-Sufficiency

Physiological Self-Sufficiency

Through the practice of the Transcendental Meditation and TM-Sidhi programs, direct experience of the cosmic psyche increases physiological self-sufficiency—the ability to maintain a healthy style of physical functioning without outside interventions—as indicated by:

1. improved general health:

- decreased susceptibility to, and discomfort from, physical and general complaints (Overbeck, 1982).

- less insomnia and improved quality of sleep (Abrams & Seigel, 1978; Farinelli, 1981; Fuson, 1976).
 - decreased need for medicines and non-prescribed drugs, including tranquilizers, sleep medication, analgesics, cigarettes, alcohol, and coffee (Brooks & Scarano, 1985; Dhanaraj, 1973; Farinelli, 1981; Geisler, 1978; Monahan, 1977; Ovebeck, 1982; Shafii, Lavelly, & Jaffe, 1974, 1975, 1976).
 - better health for mother and child during pregnancy and childbirth—fewer medical complaints and less anxiety and pain, shorter duration of labor, lower frequency of operative interventions during labor (Heidelberg, 1979).
 - decreased psychosomatic complaints (Overbeck, 1982).
 - decreased musculoskeletal complaints (Overbeck, 1982).
 - better health of the respiratory and digestive systems (Farinelli, 1981).
 - less eczema (Farinelli, 1981).
2. improved health of the immune system:
 - fewer infections (Farinelli, 1981).
 - benefits for subjects with allergies (Farinelli, 1981).
 - reduced inflammation of the gums (Seiler & Seiler, 1979).
 - fewer infectious diseases (Orme-Johnson, 1987b).
 3. benefits for patients recovering from illness:
 - better health for severe bronchial asthma and heart disease patients (Graf & Pfisterer, 1978).
 - improved mental and physical health in patients on a kidney/dialysis program (Doner, 1976).
 - general physical and mental well-being in individuals under medical care (Lovell-Smith, 1982).
 4. benefits for psychiatric patients:
 - decreased overactive, impulsive behavior, improved sleep patterns (Candelent & Candelent, 1975).
 - decreased stuttering (Allen, 1979).
 - benefits for patients with aggressive behavior, mental retardation, and epilepsy—reduced frequency and severity of seizures, reduction of abnormal EEG features, normalization of neurotransmitter metabolites (Subrahmanyan & Porkodi, 1980).
 5. decreased medical care utilization (Orme-Johnson, 1987b; Orme-Johnson & Vegors, 1988):
 - Over 50% reductions in both hospitalization and outpatient doctor visits in all age categories, with the largest decreases relative to controls for individuals over 40.
 - decreased hospitalization in all categories of disease—including an 87.3% reduction in heart disease, and a 55.4% reduction in tumors.
 6. increased health and self-sufficiency for the elderly (Alexander et al., 1986):
 - increased longevity.
 - increased cognitive and perceptual flexibility.
 - increased behavioral flexibility.
 - improved mental health.
 - more ideal levels of blood pressure.

These physiological changes find expression in psychological changes.

Psychological Self-Sufficiency

Through the regular practice of the Transcendental Meditation and TM-Sidhi programs, direct experience of the cosmic psyche increases psychological self-sufficiency—a happy, productive frame of mind without dependence on others—as indicated by:

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1. increased self-sufficiency on measures of perception:

- increased field independence, the ability to perceive a target stimulus without being distracted by a complicating background field (Dillbeck, Assimakis et al., 1986; Gelderloos, Lockie, & Chuttoorgoon, 1987; Jedrczak, 1984; Pelletier, 1974).
- improved spatial orienting ability in the absence of external cues as indicated by improvement on the rod and frame test (Pelletier, 1974).
- reduced need for external stimulation (Friend & Maliszewski, 1978).
- increased freedom from habitual patterns of perception (Dillbeck, 1982).
- increased vigilance and improved capacity for selective attention (Banquet & Lesevre, 1980).
- faster reactions (Holt et al., 1978), and perceptual-motor speed positively correlated with length of time practicing the TM-Sidhi program (Jedrczak, Toomey, & Clements, 1986).

2. increased self-sufficiency on measures of memory and cognition:

- improved cognitive ability and cognitive style (Dillbeck, Assimakis et al., 1986).
- improved spatial localization (Harrison et al., 1976).
- increased self-sufficiency in executing right hemisphere tasks as indicated by enhanced tonal memory (Pagano & Frumkin, 1977) and increased originality of figural creativity (Travis, 1979).
- increased self-sufficiency in executing left hemisphere tasks as indicated by increased fluency of verbal creativity (Travis, 1979).
- increased visual memory positively correlated with length of time practicing the TM-Sidhi program (Jedrczak et al., 1986).
- higher levels of cognitive development in meditating children (Warner, 1986).

3. increased self-sufficiency on measures of intellectual ability:

- increased ability to use the intellect effectively in novel situations as indicated by increased fluid intelligence (A. Aron et al., 1981; Dillbeck, Assimakis et al., 1986; Tjoa, 1975).
- increased learning ability (Kotchabhakdi et al., 1982).
- increased moral reasoning (S. Nidich, 1975; Kotchabhakdi et al., 1982).
- improved academic performance in graduate students (Kember, 1985).
- increased overall academic achievement (math ability, reading ability, and work/study skills) in meditating children (S. Nidich et al., 1986).
- longitudinal increases in intelligence in MIU students (A. Aron et al., 1981; Cranson, 1988; Dillbeck, Assimakis et al., 1986).

4. increased self-sufficiency on measures of the ego function:

- increased freedom from distress during acute experimental pain (Mills & Farrow, 1981).
- decreased stress (e.g., Kanellakos, 1978).
- inner directedness— independence, self-supportiveness (Hjelle, 1974; S. Nidich et al., 1973, 1974; Seeman et al., 1972), higher field independence in children (Gelderloos, Lockie, & Chuttoorgoon, 1987).
- increased ego strength and greater trust (Berg & Mulder, 1976).
- greater autonomy (Penner et al., 1974).
- better opinion of oneself, greater sense of personal worth, greater satisfaction with one's moral worth and relationship with God and religion (Nystul & Garde, 1977).
- decreased anxiety, neuroticism, depression, somatic neurotic instability (Berg & Mulder, 1976; Dillbeck, 1977; Ferguson & Gowan, 1976; Hjelle, 1974; Penner et al., 1974; Tjoa, 1975).
- increased psychological health (Gelderloos, Goddard, Ahlstrom, & Jacoby, 1987; Gelderloos, Lockie, Chuttoorgoon, 1987):

- improved unity, autonomy, and creativity for TM-Sidhi participants compared with TM practitioners, and for TM practitioners compared with non-meditators.
- increased integration of moral values, increased sense of well-being for TM practitioners and TM-Sidhi participants compared with non-meditators.
- increased emotional involvement in life events, higher psychological growth rate, and higher orientation toward positive values for TM-Sidhi participants compared with non-meditators (Gelderloos, Goddard, Ahlstrom, & Jacoby, 1987).
- correlation of physiological indications of higher states of consciousness with psychological health (unifying, autonomy, creativity, and directedness; higher affective involvement),
- higher orientation toward positive values in advanced participants of the TM and TM-Sidhi program (better recall of positively valued words, higher appraisal of "significant others," need of fewer exposures to recognize positive rather than negative words, lower recognition threshold for positive words, indications of more positive affect) (Gelderloos, Goddard, Ahlstrom, & Jacoby, 1987).

These psychological changes find expression in sociological changes.

Sociological Self-Sufficiency

Through the regular practice of the Transcendental Meditation and TM-Sidhi program, direct experience of the cosmic psyche increases sociological self-sufficiency—a society comprised of self-sufficient individuals—as indicated by:

1. increased self-sufficiency in special education:
 - decreased dropout from school and increased self-actualization with regard to aspects of personality relevant to learning disorders in economically deprived adolescents with learning problems: increased independence and supportiveness and improved self-regard (Jackson, 1977).
 - decreased stuttering (Allen, 1979; McIntyre, Silverman, & Trotter, 1974).
 - improvements in autism: decreased echolalic behavior (Wood, 1981).
 - benefits for mentally retarded subjects—improved social behavior, health, and cognitive functioning (Eyerman, 1981; Subrahmanyam & Porkodi, 1980).
2. decreased substance abuse:
 - decreased drug abuse (A. Aron & E.N. Aron, 1980; E.N. Aron & A. Aron, 1983; Dhanaraj, 1973; Geisler, 1978; Monahan, 1977; Shafii et al., 1974).
 - decreased use of alcohol (A. Aron & E.N. Aron, 1980; E.N. Aron & A. Aron, 1983; Brooks & Scarano, 1985; Dhanaraj, 1973; Monahan, 1977; Shafii et al., 1975).
 - decreased use of tobacco (A. Aron & E.N. Aron, 1980; E.N. Aron & A. Aron, 1983; Dhanaraj, 1973; Monahan, 1977; Shafii et al., 1976).
 - decreased need for tranquilizers and other prescribed drugs (Monahan, 1977).
3. increased self-sufficiency in business:
 - improved physical health and mental well-being, reduced hard liquor consumption, reduced cigarette consumption, improved quality of sleep, fewer sick days (Alexander, Swanson et al., 1987; Swanson, in press).
 - reduced anxiety about promotion (Frew, 1974).
4. increased self-sufficiency in marriage and family:
 - greater adjustment and marital satisfaction (E.N. Aron & A. Aron, 1982; Suarez, 1976).

- increased psychological health within the family (Chen, 1985).
 - increased efficiency in dealing with family tasks.
 - increased respect and cooperation among family members in negotiations with each other.
 - increased coalition between parents when dealing with their children.
 - increased clarity of expression among family members as indicated by more open and direct communication of thoughts and feelings.
5. increased self-sufficiency in those seeking psychiatric help:
- resolution of spiritual crisis through development of integration of personality (Bloomfield & Kory, 1978).
 - improvements in post-Vietnam adjustment problems—decreased anxiety, depression, alcohol consumption, insomnia, and family problems, and increased employment status (Brooks & Scarano, 1985).
 - benefits for patients with psychiatric and addictive disorders (including alcoholism, drug abuse, and gambling), greater ability to maintain employment, more frequently maintained on out-patient care alone (Bielefeld, 1981).
 - improvements in psychosomatic disorders (Graf & Pfisterer, 1978).
 - benefits for psychiatric patients with schizophrenia, neurosis, personality disorder, alcohol and drug problems (Candelent & Candelent, 1975).
 - improvements in aggressive psychiatric patients—decreased frequency and severity of attacks of aggressive behavior, normalization of neurotransmitter metabolite and plasma Cortisol levels (Subrahmanyam & Porkodi, 1980).
6. increased self-sufficiency of prisoners:
- decreased anxiety, neuroticism, resentment, negativism, irritability, hostility, and disciplinary rule infractions, and improved sleep patterns (Abrams & Siegel, 1978; Abrams, 1979).
 - decreased recidivism—fewer new prison terms and more favorable parole outcomes (Alexander, 1982; Bleick & Abrams, 1987).
 - increased self-development, decreased aggression, and decreased symptoms of mental disorder in maximum security prisoners (Alexander, 1982).
 - rehabilitation of juvenile offenders (A. Aron & E.N. Aron, in press).

These sociological changes find expression in ecological changes.

Ecological Self-Sufficiency

Through the regular practice of the Transcendental Meditation and TM-Sidhi program, direct experience of the cosmic psyche increases ecological self-sufficiency—the ability of the ecology to balance itself and maintain ecological health—as indicated by:

1. increased expression of self-sufficiency in the ecosystem on the city level—spontaneous reduction of negative trends in society:
- an immediate drop in crime rate in U.S. cities and a reduction in crime trend when 1% of the population participates in the TM program (Borland & Landrith, 1976; Dillbeck, Landrith, & Orme-Johnson, 1981).
 - decreased crime rate in cities (Union Territory of Delhi and Metro Manila) during experimental periods in which the number of participants practicing the TM and TM-Sidhi program in a group exceeded the square root of 1% of the population (Dillbeck, Cavanaugh et al., 1987).
2. increased expression of self-sufficiency in the ecosystem on the state level—spontaneous reduction of negative trends and increase of positive trends in society:
- improved quality of life on the state level on a composite index—crime rate, motor vehicle fatalities, auto accidents, deaths, alcoholic beverage and cigarette consumption, unemployment, pollution—when the number of partici-

- pants practicing the TM and TM-Sidhi program in a group exceeded the square root of 1% of the population (Dillbeck, Cavanaugh et al., 1987).
3. increased expression of self-sufficiency in the ecosystem on the national level—spontaneous reduction of negative trends and increase of positive trends in society:
 - decreased inflation and unemployment in the U.S. and Canada when the number of participants practicing the TM and TM-Sidhi program in a group exceeded the square root of 1% of the national population (Cavanaugh, 1987).
 - improved quality of life in the U.S. on a composite index—crime rate, notifiable disease rate, hospital admissions rate, infant mortality rate, suicide rate, cigarette consumption per capita, alcohol consumption per capita, GNP per capita, patent application rate, divorce rate, and traffic fatalities rate—when the number of participants practicing the TM and TM-Sidhi program in a group exceeded the square root of 1% of the national population (Orme-Johnson, Gelderloos, & Dillbeck, in press).
 - improved quality of life in Israel—decreased crime, decreased traffic fatalities, decreased fires, improved national mood, and increased stock market—when the number of participants practicing the TM and TM-Sidhi program in a group exceeded the square root of 1% of the national population (Orme-Johnson, Alexander, Davies, Chandler, & Larimore, in press).
 - decreased violence in the U.S.—decreased homicide, suicide, and traffic fatalities (Dillbeck, 1988).
 - decreased violence and casualties and increased cooperative action between antagonists in the Lebanon war (Davies, 1988).
 4. increased expression of self-sufficiency in the ecosystem on the world level—spontaneous increase of peace and positive trends worldwide:
 - decreased war intensity and fewer war deaths in Lebanon when the number of participants practicing the TM and TM-Sidhi program in a group exceeded the square root of 1% of the population of Israel and Lebanon, taking into account the number of TM meditators in the population (Orme-Johnson, Alexander, Davies, Chandler, & Larimore, in press).
 - increased progress towards peace and reduced injuries and war deaths during three experimental periods in which the number of participants practicing the TM and TM-Sidhi program in a group exceeded the number predicted to be necessary to influence the war (Alexander, Abou Nader et al., 1987).
 - decreased international conflicts and increased economic prosperity during three experimental periods in which the number of participants practicing the TM and TM-Sidhi program in a group approached or exceeded the square root of 1% of the world population (Orme-Johnson, 1981; Dillbeck, 1987).
 - improved U.S.-Soviet relations as a result of the group practice of the TM and TM-Sidhi program (Gelderloos et al., in press).

Infinite Dynamism

Physiological Infinite Dynamism

Through the Transcendental Meditation and TM-Sidhi programs, direct experience of the cosmic psyche increases the expression of infinite dynamism in the physiology as indicated by:

1. more dynamic brain functioning:
 - shorter latencies of auditory evoked potentials (Kobal et al., 1975; Wandhofer et al., 1976).

- shorter latency and larger amplitude of visual evoked potentials (Banquet & Lesèvre, 1980).
 - changes in brain stem auditory potentials suggesting enhanced signal-to-noise ratio (McEvoy, Frumkin, & Harkins, 1980).
 - greater adaptability of brain functioning—greater lateral EEG asymmetry during left & right hemisphere tasks (Bennett & Trinder, 1977).
 - EEG indications of greater alertness (Williams & West, 1975).
 - increased EEG coherence (Dillbeck & Bronson, 1981; Levine, 1976) together with correlations found between high EEG coherence and experiences of transcendental consciousness, neurological efficiency, and high levels of creativity, flexibility of concept learning, high levels of principled moral reasoning, and intelligence (Badawi et al., 1984; Dillbeck & Bronson, 1981; Levine, 1976; Dillbeck, Orme-Johnson, & Wallace, 1981; S. Nidich et al., 1983; Orme-Johnson, 1977; Orme-Johnson & Haynes, 1981; Orme-Johnson, Wallace, Dillbeck, Alexander, & Ball, 1982; Wallace, Mills, Orme-Johnson, Dillbeck, & Jacobe, 1982), high IQ in children (Hernandez, 1988), and enhanced semantic facilitation (Sheppard, 1988).
 - increased strength, sensitivity, and flexibility of the nervous system as indicated by improved auditory thresholds and faster reactions (Schwartz, 1979).
2. biochemical changes correlated with more dynamic leadership:
- increased serotonin metabolite (Bujatti & Riederer, 1976; Walton et al., 1981, 1983, in press).
3. faster reflexes:
- decreased reflex latency and reflex motor time (Warshal, 1980).
 - enhanced recovery of the paired H-reflex (Wallace, Mills, Orme-Johnson, Dillbeck, & Jacobe, 1983).
 - faster reactions (Appelle & Oswald, 1974; Holt, Caruso, & Riley, 1978; Banquet & Lesèvre, 1980).
4. increased autonomic adaptability:
- faster recovery of the electrodermal system to baseline in response to stress.
 - integration of opposite styles of physiological functioning: simultaneous increased activity of sympathetic and parasympathetic branches of the autonomic nervous system (Lang, Dehof, Meurer, & Kaufman, 1979).
5. younger biological age:
- more optimal levels of systolic blood pressure, auditory thresholds, and near point vision compared to population norms (Wallace, Dillbeck, Jacobe, & Harrington, 1982).
 - younger biological age correlated with duration of practice of the TM and TM-Sidhi program (Wallace, Dillbeck, Jacobe, & Harrington, 1982).
 - increased dynamism in the elderly (Alexander et al., 1986).
 - increased longevity.
 - increased cognitive and perceptual flexibility.
 - increased behavioral flexibility.
 - improved mental health.
 - more ideal levels of blood pressure.
 - elevated serum dehydroepiandrosterone sulfate levels in older practitioners—reduced risk of early death, breast cancer, and heart disease of all kinds; reduced deleterious influence of chronic stress (Glaser, Brind, Eisner, & Wallace, 1987).
 - zero erythrocyte sedimentation rate (ESR)—reduced risk of coronary artery disease, myocardial infarction, and future development of serious disease (Smith, Glaser, & Dillbeck, 1987).

These physiological changes find expression in psychological changes.

Psychological Infinite Dynamism

Through the regular practice of the Transcendental Meditation and TM-Sidhi programs, direct experience of the cosmic psyche increases the expression of infinite dynamism on all levels of the mind as indicated by:

1. increased expression of infinite dynamism on measures of perception:
 - increased speed of disembedding visual information from a distracting field (Dillbeck, Assimakis et al., 1986; Gelderloos, Lockie, & Chuttoorgoon, 1987; Jedrczak, 1984; Pelletier, 1974).
 - increased accuracy of kinesthetic discrimination (Friend & Maliszewski, 1978).
 - improved efficiency of visual perception (Dillbeck, 1982).
 - faster reactions with fewer mistakes; shorter latency and larger amplitude of visual evoked potentials (Banquet & Lesèvre, 1980).
 - faster performance on visual choice reaction time, a correlate of intelligence (Cranson, 1988; Holt et al., 1978), and perceptual-motor speed positively correlated with length of time practicing the TM-Sidhi program (Jedrczak et al., 1986).
2. increased expression of infinite dynamism on measures of memory and cognition:
 - improved cognitive ability and cognitive style (Dillbeck, Assimakis, et al., 1986).
 - improved connection between a stable internal frame of reference and spatial sensory cues as indicated by improvement on the rod and frame test (Pelletier, 1974) and improved spatial localization (Harrison et al., 1976).
 - increased dynamism of right hemisphere functioning as indicated by enhanced tonal memory (Pagano & Frumkin, 1977) and increased flexibility of figural creativity (Travis, 1979).
 - greater adaptability of mental orientation (Penner et al., 1974).
 - increased fluency of verbal creativity (Travis, 1979).
 - higher creativity (Jedrczak et al., 1985).
 - increased visual memory positively correlated with length of time practicing the TM-Sidhi program (Jedrczak et al., 1986).
 - higher levels of cognitive development in meditating children (Warner, 1986).
3. increased expression of infinite dynamism on measures of intellectual ability:
 - improved capacity of the intellect to integrate the goals of the Self with the demands of new and complex environments, as indicated by increased fluid intelligence (A. Aron et al., 1981; Dillbeck, Assimakis et al., 1986; Tjoa, 1975).
 - increased learning ability (Kotchabhakdi et al., 1982).
 - increased moral reasoning (Kotchabhakdi et al., 1982).
 - improved academic performance (Kember, 1985).
 - higher intelligence correlated with length of practice of the TM-Sidhi program (Jedrczak et al., 1985).
 - increased overall academic achievement (math ability, reading ability, and work study skills) in meditating children (S. Nidich et al., 1986).
 - longitudinal increases in intelligence in MIU students (A. Aron et al., 1981; Cranson, 1988; Dillbeck, Assimakis, et al., 1986).
4. increased expression of infinite dynamism on measures of the ego function:
 - increased spontaneity, increased time competence (ability to live more fully in the present, the ability to connect the past and future meaningfully) (Hjelle, 1974; S. Nidich et al., 1973; Seeman et al., 1972).
 - increased psychological health (Gelderloos, Goddard, Ahlstrom, & Jacoby, 1987; Gelderloos, Lockie, & Chuttoorgoon, 1987).

- improved unity, autonomy, and creativity for TM-Sidhi participants compared with TM practitioners, and for TM practitioners compared with non-meditators.
- increased integration of moral values, increased sense of well-being for TM practitioners and TM-Sidhi participants compared with non-meditators.
- increased emotional involvement in life events, higher psychological growth rate, and higher orientation toward positive values for TM-Sidhi participants compared with non-meditators.
- correlation of physiological indications of higher states of consciousness with psychological health (unifying, autonomy, creativity, and directedness; higher affective involvement).
- higher orientation toward positive values in advanced participants of the TM and TM-Sidhi program (better recall of positively valued words, higher appraisal of "significant others," need of fewer exposures to recognize positive rather than negative words, lower recognition threshold for positive words, indications of more positive affect) (Gelderloos, Goddard, Ahlstrom, & Jacoby, 1987).

These psychological changes find expression in sociological changes.

Sociological Infinite Dynamism

Through the regular practice of the Transcendental Meditation and TM-Sidhi program, direct experience of the cosmic psyche increases the expression of infinite dynamism in society as indicated by:

1. general changes indicating increased dynamism in society:
 - greater sense of social responsibility (A. Aron et al., 1981; Brown, 1976/1977).
 - increased outgoingness and tendency to participate (Troll, 1978).
 - greater optimism (Brown, 1976/1977).
 - increased sociability (A. Aron et al., 1981; Geisler, 1978; Hanley & Spates, 1978; Penner et al., 1974).
 - growth of a more sympathetic, helpful, caring nature (Marcus, 1977; Throll, 1978).
 - growth of a more tactful, forgiving, caring nature (Throll, 1978).
 - increased ability to be objective and fair-minded (Marcus, 1977).
 - increased good humor (Geisler, 1978).
2. increased expression of infinite dynamism in education:
 - improved performance on basic skills tests in school children: math, reading, language, study skills (S. Nidich et al., 1986; S. Nidich & R. Nidich, 1987).
 - improved examination scores (Kember, 1985).
 - greater interest in academic activities and greater social extroversion (Penner et al., 1974).
3. increased expression of infinite dynamism in business:
 - greater ability to assign priorities, greater decision-making ability, greater ability to accomplish more with less effort (Jonsson, 1975).
 - decreased turnover propensity in business (Frew, 1974).
 - decreased fatigue, improved personal and work relationships, increased job satisfaction (Alexander, Swanson et al., 1987; Frew, 1974).
 - increased efficiency and productivity (Frew, 1974; Swanson, in press).
 - increased net income, decreased sick days (Swanson, in press).
4. increased expression of infinite dynamism in marriage and family:
 - greater adjustment (E.N. Aron & A. Aron, 1982; Suarez, 1976).
 - greater agreement on conduct and recreation (Suarez, 1976).
 - greater intimacy and happiness (Suarez, 1976).
 - increased cooperation and efficiency in dealing with family tasks (Chen, 1985).

- more open and direct communication of thoughts and feelings among family members (Chen, 1985).

These sociological changes find expression in ecological changes.

Ecological Infinite Dynamism

Through the regular practice of the Transcendental Meditation and TM-Sidhi programs, direct experience of the cosmic psyche increases the expression of infinite dynamism in society as indicated by:

1. increased expression of infinite dynamism in the ecosystem on the city level—reduced inertia and imbalance:
 - an immediate drop in crime rate in U.S. cities and a reduction in crime trend when 1% of the population participates in the TM program (Borland & Landrith, 1976; Dillbeck, Landrith, & Orme-Johnson, 1981).
 - decreased crime rate in cities (Union Territory of Delhi and Metro Manila) during experimental periods in which the number of participants practicing the TM and TM-Sidhi program in a group exceeded the square root of 1% of the population (Dillbeck, Cavanaugh et al., 1987).
2. increased expression of infinite dynamism in the ecosystem on the state level—reduced inertia and imbalance and improved quality of life:
 - improved quality of life in the state of Rhode Island on a composite index—crime rate, motor vehicle fatalities, auto accidents, deaths, alcoholic beverage and cigarette consumption, unemployment, pollution—when the number of participants practicing the TM and TM-Sidhi program in a group exceeded the square root of 1% of the population (Dillbeck, Cavanaugh et al., 1987).
3. increased expression of infinite dynamism in the ecosystem on the national level—increased economic vitality and improved quality of life:
 - decreased inflation and unemployment in the U.S. and Canada when the number of participants practicing the TM and TM-Sidhi program in a group exceeded the square root of 1% of the national population (Cavanaugh, 1987).
 - improved quality of life in the U.S. on a composite index—crime rate, notifiable disease rate, hospital admissions rate, infant mortality rate, suicide rate, cigarette consumption per capita, alcohol consumption per capita, GNP per capita, patent application rate, divorce rate, and traffic fatalities rate—when the number of participants practicing the TM and TM-Sidhi program in a group exceeded the square root of 1% of the national population, taking into account the number of TM meditators in the population (Orme-Johnson, Gelderloos, & Dillbeck, in press).
 - improved quality of life in Israel—decreased crime, decreased traffic fatalities, decreased fires, improved national mood, and increased stock market—when the number of participants practicing the TM and TM-Sidhi program in a group exceeded the square root of 1% of the national population (Orme-Johnson, Alexander, Davies, Chandler, & Larimore, in press).
4. increased expression of infinite dynamism in the ecosystem on the world level—decreased inertia and imbalance and increased cooperation and peace:
 - decreased war intensity and fewer war deaths in Lebanon when the number of participants practicing the TM and TM-Sidhi program in a group exceeded the square root of 1% of the population of Israel and Lebanon, taking into account the number of TM meditators in the population (Orme-Johnson, Alexander, Davies, Chandler, & Larimore, in press).
 - increased progress towards peace and reduced injuries and war deaths during three experimental periods in which the number of participants practicing the TM and TM-Sidhi program in a group exceeded the number predicted to

be necessary to influence the war (Alexander, Abou Nader, et al., 1987; Davies, 1988).

- decreased international conflicts and increased economic prosperity during three experimental periods in which the number of participants practicing the TM and TM-Sidhi program in a group approached or exceeded the square root of 1% of the world population (Orme-Johnson, 1987a; Dillbeck, 1987).
- improved U.S.-Soviet relations as a result of the group practice of the TM and TM-Sidhi program (Gelderloos et al., in press).

References

- Abrams, A.I. (1979). Transcendental Meditation and rehabilitation at Folsom Prison: Response to a critique. *Criminal Justice and Behavior*, 6, 13-21.
- Abrams, A.I., & Siegel, L.M. (1978). The Transcendental Meditation program and rehabilitation at Folsom State Prison: A cross-validation study. *Criminal Justice and Behavior*, 5, 3-20.
- Alexander, C.N. (1982). Ego development, personality, and behavioral change in inmates practicing the Transcendental Meditation technique or participating in other programs: A cross-sectional and longitudinal study (Doctoral dissertation, Harvard University, 1982). *Dissertation Abstracts International*, 43, 539B.
- Alexander, C.N., Abou Nader, T.M., Cavanaugh, K.L., Davies, J.L., Kfoury, R.J., Dillbeck, M.C., & Orme-Johnson, D.W. (1987, May 7). *Time series analysis of possible effects of the Maharishi Technology of the Unified Field on the war in Lebanon*. Paper presented at the annual conference of the Midwest Psychological Association, Chicago.
- Alexander, C.N., Davies, J.L., Dixon, C.A., Dillbeck, M.C., Oetzel, R.M., Druker, S.M., Muehlman, J.M., & Orme-Johnson, D.W. (in press). Higher stages of consciousness beyond formal operations: The Vedic psychology of human development. In C.N. Alexander & E.J. Langer (Eds.), *Higher stages of human development: Perspectives on adult growth*. New York: Oxford University Press.
- Alexander, C.N., Langer, E.J., Davies, J.L., Chandler, H.M., & Newman, R. (1986, April). *Self-regulation procedures to enhance health and longevity: Transcendental Meditation, mindfulness, and the elderly*. Paper presented at the 36th annual conference of the National Council on the Aging, Washington, DC.
- Alexander, C.N., Swanson, G., Rainforth, M., Carlisle, T., & Todd, C. (1987, March). *The effects of the Transcendental Meditation program on stress reduction, job performance, and health in two business settings*. Paper presented at the National Conference of the Center for Management Research, Maharishi International University, Fairfield, IA.
- Allen, C.P. (1979). Effects of Transcendental Meditation, electromyographic (EMG) biofeedback relaxation, and conventional relaxation on vasoconstriction, muscle tension, and stuttering: A quantitative comparison (Doctoral dissertation, University of Michigan, Ann Arbor, 1979). *Dissertation Abstracts International*, 40, 689B.
- Allison, J. (1970). Respiratory changes during Transcendental Meditation. *The Lancet*, 7651, 833.
- Antoniadis, I., Ellis, J., Hagelin, J.S., & Nanopoulos, D.V. (1987). Supersymmetric Flipped SU(5) Revitalized. *Physics Letters*, 194B, 231.
- Appelle, S., & Oswald, L.E. (1974). Simple reaction time as a function of alertness and prior mental activity. *Perceptual and Motor Skills*, 38, 1263-1268.
- Aron, A., & Aron, E.N. (1980). The Transcendental Meditation program's effect on addictive behavior. *Addictive Behaviors*, 5, 3-12.
- Aron, A., & Aron, E.N. (in press). Rehabilitation of juvenile offenders through the

- Transcendental Meditation program: A controlled study. *Journal of Crime and Justice*.
- Aron, A., Orme-Johnson, D., & Brubaker, P. (1981). The Transcendental Meditation program in the college curriculum: A 4-year longitudinal study of effects on cognitive and affective functioning. *College Student Journal*, 15, 140-146.
- Aron, E.N., & Aron, A. (1982). Transcendental Meditation program and marital adjustment. *Psychological Reports*, 51, 887-890.
- Aron, E.N., & Aron, A. (1983). The patterns of reduction of drug and alcohol use among Transcendental Meditation participants. *Bulletin of the Society of Psychologists in Addictive Behaviors*, 2, 28-33.
- Badawi, K., Wallace, R.K., Orme-Johnson, D., & Rouzeré, A.M. (1984). Electrophysiologic characteristics of respiratory suspension periods occurring during the practice of the Transcendental Meditation program. *Psychosomatic Medicine*, 46, 267-276.
- Bagga, O.P., & Gandhi, A. (1983). A comparative study of the effect of the Transcendental Meditation (T.M.) and Shavasana practice on cardiovascular system. *Indian Heart Journal*, 35, 39-45.
- Banquet, J.P. (1972). EEG and meditation [Abstract]. *Electroencephalography and Clinical Neurophysiology*, 33, 454.
- Banquet, J.P. (1973). Spectral analysis of the EEG in meditation. *Electroencephalography and Clinical Neurophysiology*, 35, 143-151.
- Banquet, J.P., & Lesèvre, N. (1980). Event-related potentials in altered states of consciousness. *Progress in Brain Research*, 54, 447-453.
- Banquet, J.P., & Sailhan, M. (1974). Analyse E.E.G. d'états de conscience induits et spontanés [EEG analysis of spontaneous and induced states of consciousness]. *Revue d'Electroencephalographie et de Neurophysiologie Clinique*, 4, 445-453.
- Bennett, J.E., & Trinder, J. (1977). Hemispheric laterality and cognitive style associated with Transcendental Meditation. *Psychophysiology*, 14, 293-296.
- Berg, W.P. van den, & Mulder, B. (1976). Psychological research on the effects of the Transcendental Meditation technique on a number of personality variables. *Gedrag: Tijdschrift voor Psychologie* [Behavior: Journal of Psychology], 4, 206-218.
- Bevan, A.J.W. (1980). Endocrine changes in Transcendental Meditation [Abstract]. *Clinical and Experimental Pharmacology and Physiology*, 7, 75-76.
- Bevan, A.J.W., Young, P.M., Wellby, M.L., Nenadovic, P., & Dickins, J.A. (1976). Endocrine changes in relaxation procedures [Abstract]. *Proceedings of the Endocrine Society of Australia*, 19, 59.
- Bielefeld, M. (1981, August 24). TM: A stress reducing self-help support system. In *Vocational rehabilitation: Do psychologists really belong?* Symposium conducted at the annual convention of the American Psychological Association, Los Angeles.
- Blackwell, B., Hanenson, I.B., Bloomfield, S.S., Magenheimer, H.G., Nidich, S.I., & Gartside, P. (1975). Effects of Transcendental Meditation on blood pressure: A controlled pilot experiment [Abstract]. *Psychosomatic Medicine*, 37, 86.
- Bleick, C.R., & Abrams, A.I. (1987). The Transcendental Meditation program and criminal recidivism in California. *Journal of Criminal Justice*, 15, 211-230.
- Bloomfield, H.H., & Kory, R. (1978). The Transcendental Meditation program, spiritual crisis and enlightenment. In H.H. Bloomfield & R. Kory (eds.), *Holistic way to health and happiness: A new approach to complete lifetime wellness* (pp. 243-259). New York: Simon and Schuster.
- Borland, C., & Landrith, G., III. (1976). Improved quality of city life through the Transcendental Meditation program: Decreased crime rate. In D.W. Orme-Johnson & J.T. Farrow (Eds.), *Scientific research on the Transcendental Meditation program: Collected papers* (Vol. 1, pp. 639-648). Rheinweiler, W. Germany:

- Maharishi European Research University Press.
- Brooks, J.S., & Scarano, T. (1985). Transcendental Meditation in the treatment of post-Vietnam adjustment. *Journal of Counseling and Development*, 64, 212-215.
- Brown, M. (1977). Higher education for higher consciousness: A study of students at Maharishi International University (Doctoral dissertation, University of California at Berkeley, 1976). *Dissertation Abstracts International*, 38, 649A-650A.
- Bujatti, M., & Riederer, P. (1976). Serotonin, noradrenaline, dopamine metabolites in Transcendental Meditation technique. *Journal of Neural Transmission*, 39, 257-267.
- Candelent, T., & Candelent, G. (1975). Teaching Transcendental Meditation in a psychiatric setting. *Hospital & Community Psychiatry*, 26, 156-159.
- Cavanaugh, K.L. (1987). Time series analysis of U.S. and Canadian inflation and unemployment: A test of a field-theoretic hypothesis. In *Proceedings of the American Statistical Association, Business and Economic Statistics Section* (pp. 799-804). Washington, DC: American Statistical Association.
- Chafe, W. (1985). Linguistic differences produced by differences between speaking and writing. In D. Olson, A. Hidiyard, & N. Torrance (Eds.), *Language, literacy, and education*. Cambridge, England: Cambridge University Press.
- Chalmers, R.A., Clements, G., Schenkluhn, H., & Weinless, M. (Eds.), (in press). *Scientific research on the Transcendental Meditation and TM-Sidhi programme: Collected papers* (Vols. 2-4). Vlodrop, The Netherlands: Maharishi Vedic University Press.
- Chen, M.E. (1985). A comparative study of dimensions of healthy functioning between families practicing the TM program for five years or for less than a year. *Dissertation Abstracts International*, 45, 3206B.
- Cooper, M.J., & Aygen, M.M. (1978). Effect of Transcendental Meditation on serum cholesterol and blood pressure. *Harefuah, the Journal of the Israel Medical Association*, 95(1), 1-2.
- Cooper, M.J., & Aygen, M.M. (1979). A relaxation technique in the management of hypercholesterolemia. *Journal of Human Stress*, 5(4), 24-27.
- Cranson, R.W. (1988). *Intelligence and the growth of intelligence in Maharishi's Vedic Psychology and twentieth century psychology*. Unpublished doctoral dissertation, Maharishi International University, Fairfield, IA.
- Davies, J.L. (1988). *Alleviating political violence through enhancing coherence in collective consciousness: Impact assessment analysis of the Lebanon war*. Unpublished doctoral dissertation, Maharishi International University, Fairfield, IA.
- Dhanaraj, H. (1973). The influence of Transcendental Meditation on cessation of drug use: Some preliminary findings. *RODA Summer Scholarship Abstracts*, National Health and Welfare, Ottawa, Canada.
- Dillbeck, M.C. (1977). The effect of the Transcendental Meditation technique on anxiety level. *Journal of Clinical Psychology*, 33, 1076-1078.
- Dillbeck, M.C. (1982). Meditation and flexibility of visual perception and verbal problem solving. *Memory and Cognition*, 10, 207-215.
- Dillbeck, M.C. (1983). Testing the Vedic Psychology of the "Bhagavad-Gita." *Psychologia*, 26, 232-240.
- Dillbeck, M.C. (1987). Intervention studies on reduction of domestic and international violence through collective consciousness [Abstract]. *Abstracts and Summaries of Contributed Papers, Third Midwest Conference for the United States Institute of Peace* (p. 10).
- Dillbeck, M.C. (1988). Collective consciousness and social change: Effects of the Maharishi Technology of the Unified Field on U.S. violence. *Journal of the Iowa Academy of Science*, 96(1), A56. (Abstract No. 243)

- Dillbeck, M.C. (in press). The self-interacting dynamics of consciousness as the source of the creative process in nature and human life. *Modern Science and Vedic Science*, 2.
- Dillbeck, M.C., Assimakis, P.D., Raimondi, D., Orme-Johnson, D.W., & Rowe, R. (1986). Longitudinal effects of the Transcendental Meditation and TM-Sidhi program on cognitive ability and cognitive style. *Perceptual and Motor Skills*, 62, 731-738.
- Dillbeck, M.C. & Bronson, E.C (1981). Short-term longitudinal effects of the Transcendental Meditation technique on EEG power and coherence. *International Journal of Neuroscience*, 14, 147-151.
- Dillbeck, M.C., Cavanaugh, K.L., Glenn, T., Orme-Johnson, D.W., & Mittlefehldt, V. (1987). Consciousness as a field: The Transcendental Meditation and TM-Sidhi program and changes in social indicators. *The Journal of Mind and Behavior*, 8, 67-104.
- Dillbeck, M.C., Landrith, G., III, & Orme-Johnson, D.W. (1981). The Transcendental Meditation program and crime rate change in a sample of forty-eight cities. *Journal of Crime and Justice*, 4, 25-45.
- Dillbeck, M.C. & Orme-Johnson, D.W. (1987). Physiological differences between Transcendental Meditation and rest. *American Psychologist*, 42, 879-881.
- Dillbeck, M.C., Orme-Johnson, D.W., & Wallace, R.K. (1981). Frontal EEG coherence, H-reflex recovery, concept learning, and the TM-Sidhi program. *International Journal of Neuroscience*, 15, 151-157.
- Dillbeck, M.C. & Vesely, S.A. (1986). Participation in the Transcendental Meditation program and frontal EEG coherence during concept learning. *International Journal of Neuroscience*, 29, 45-55.
- Dillbeck, S.L. (1984). Maharishi's integrated system of education: Offering excellence in American education. In *Proceedings of the hearing before the Subcommittee on Education, Arts and Humanities of the Committee on Labor and Human Resources, United States Senate, Ninety-Eighth Congress, First Session, on Examination of the report of the National Commission on Excellence in Education*, 22 September, 1983 (pp. 522-531). Washington, DC: U.S. Government Printing Office.
- Dillbeck, S.L., & Dillbeck, M.C. (1987). The Maharishi Technology of the Unified Field in education: Principles, practice, and research. *Modern Science and Vedic Science*, 1, 383-431.
- Doner, D.W., Jr. (1976). The Transcendental Meditation technique—a "self-care" program for the dialysis/transplant patient. *Journal of the American Association of Nephrology Nurses and Technicians*, 3(3), 119-125.
- Driscoll, F. (1972). TM as a secondary school subject. *Phi Delta Kappan*, 54, 236-237.
- Ellis, J., Hagelin, J.S., Kelley, S., & Nanopoulos, D.V. (1988). *Aspects of the flipped unification of strong, weak and electromagnetic interactions*. Manuscript submitted for publication.
- Eyerman, J. (1981). Transcendental Meditation and mental retardation. *Journal of Clinical Psychiatry*, 42, 35-36.
- Farinelli, L. (1981). *Possibilita di applicazioni della tecnologia della coscienza in aspetti di medicina preventiva: Una ricerca pilota*. Unpublished doctoral dissertation, Faculty of Medicine and Surgery, University of Padova at Verona, Italy.
- Farrell, D.J. (1979). Changes in metabolic rate and heart rate during meditation. *Proceedings of the Nutrition Society of Australia*, 4, 136.
- Farrow, J.T., & Hebert, J.R. (1982). Breath suspension during the Transcendental Meditation technique. *Psychosomatic Medicine*, 44, 133-153.
- Ferguson, P.C., & Gowan, J.C (1976). TM: Some preliminary findings. *Journal of Humanistic Psychology*, 16(3), 51-60.
- Frew, D.R. (1974). Transcendental Meditation and productivity. *Academy of*

- Management Journal*, 17, 362-368.
- Friend, K.E., & Maliszewski, M. (1978). More on the reliability of the kinesthetic after-effects measure and need for stimulation. *Journal of Personality Assessment*, 42, 385-391.
- Fuson, J.W. (1976). *The effect of the Transcendental Meditation program on sleeping and dreaming patterns*. Unpublished doctoral dissertation, Yale University Medical School, New Haven, CT.
- Garnier, D., Cazabat, A., Thebault, P., & Gauge, Ph. (1984). Étude expérimentale de la ventilation pulmonaire pendant la technique de Méditation Transcendental. Applications en médecine preventive. *EST-Médecine*, 4, 867-870.
- Gaylord, C., Orme-Johnson, D., & Travis, F. (1988). *The effects of the Transcendental Meditation technique and progressive muscle relaxation on EEG coherence, stress reactivity, and mental health in black adults*. Manuscript submitted for publication.
- Gaylord, C., Orme-Johnson, D., Willbanks, M., & Travis, F. (1988). *The effects of the Transcendental Meditation program on self-concept, mental health, empathy, and EEG coherence in minority college students*. Manuscript submitted for publication.
- Geisler, M. (1978). Therapeutische Wirkungen der Transzendentalen Meditation auf Drogenkonsumenten. *Zeitschrift für klinische Psychologie*, 7(4), 235-255.
- Gelderloos, P. (1987a). *Valuation and Transcendental Meditation*. Lelystad, The Netherlands: Soma Scientific Publisher.
- Gelderloos, P. (1987b). Psychological health and development of students at Maharishi International University: A controlled longitudinal study. *Modern Science and Vedic Science*, 1, 471-487.
- Gelderloos, P., Frid, M.J., Goddard, P., Xue, X., & Löliger, S. (in press). Creating world peace through the collective practice of the Maharishi Technology of the Unified Field: Improved U.S.-Soviet relations. *Social Science Perspectives Journal*.
- Gelderloos, P., Goddard, P.H., III, Ahlstrom, H.H.B., & Jacoby, R. (1987). Cognitive orientation toward positive values in advanced participants of the TM and TM-Sidhi program. *Perceptual and Motor Skills*, 64, 1003-1012.
- Gelderloos, P., Lockie, R., & Chuttoorgoon, S. (1987). Field independence of students at Maharishi School of the Age of Enlightenment and a Montessori school. *Perceptual and Motor Skills*, 65, 613-614.
- Glaser, J.L., Brind, J.L., Eisner, M.J., Vogelman, J., Dillbeck, M., Chopra, D., & Wallace, R.K. (1987). Elevated serum dehydroepiandrosterone sulfate levels in older practitioners of the Transcendental Meditation and TM-Sidhi program. *Age*, 10(4), 160. (Abstract No. 13)
- Goodenough, D.R. (1976). The role of individual differences in field dependence as a factor in learning and memory. *Psychological Bulletin*, 83, 675-694.
- Gräf, D., & Pfisterer, G. (1978). Der Nutzen der Technik der Transzendentalen Meditation für die ärztliche Praxis. *Erfahrungsheilkunde*, 9, 594-596.
- Hagelin, J.S. (1987). Is consciousness the unified field? A field theorist's perspective. *Modern Science and Vedic Science*, 1, 29-87.
- Handmacher, B.H. (1978). Time in meditation and sex differences related to intrapersonal and interpersonal orientation (Doctoral dissertation, Ohio State University, Columbus, 1978). *Dissertation Abstracts International*, 39, 676A.
- Hanley, C.P., & Spates, J.L. (1978). Transcendental Meditation and social psychological attitudes. *The Journal of Psychology*, 99, 121-127.
- Harrison, S.D., Pagano, R., & Warrenburg, S. (1976). Meditation and right hemispheric functioning—spatial localization [Abstract]. In *Proceedings of the Biofeedback Research Society, Seventh Annual Meeting* (p. 33).
- Hebert, R., & Lehmann, D. (1977). Theta bursts: An EEG pattern in normal subjects practising the Transcendental Meditation technique. *Electroencephalog-*

- raphy and *Clinical Neurophysiology*, 42, 397-405.
- Heidelberg, R. (1979). *Transzendente Meditation in der geburtshilflichen Psychoprophylaxe*. Unpublished doctoral dissertation, Medical Faculty, Free University of Berlin, West Berlin.
- Hernandez, R.S. (1988). *The effects of task condition on the correlation of EEG coherence and full scale IQ*. Unpublished doctoral dissertation, Maharishi International University, Fairfield, IA.
- Hjelle, L.A. (1974). Transcendental Meditation and psychological health. *Perceptual and Motor Skills*, 39, 623-628.
- Holeman, R., & Seiler, G. (1979). Effects of sensitivity training and Transcendental Meditation on perception of others. *Perceptual and Motor Skills*, 49, 270.
- Holt, W.R., Caruso, J.L., & Riley, J.B. (1978). Transcendental Meditation vs pseudo-meditation on visual choice reaction time. *Perceptual and Motor Skills*, 46, 726.
- Honsberger, R.W., & Wilson, A.F. (1973a). The effect of Transcendental Meditation upon bronchial asthma [Abstract]. *Clinical Research*, 21, 278.
- Honsberger, R.W., & Wilson, A.F. (1973b). Transcendental Meditation in treating asthma. *Respiratory Therapy: The Journal of Inhalation Technology*, 3, 79-80.
- Jackson, Y. (1977). Learning disorders and the Transcendental Meditation program: Retrospects and prospects. A preliminary study with economically deprived adolescents (Doctoral dissertation, University of Massachusetts, Amherst, 1977). *Dissertation Abstracts International*, 38, 3351A.
- Jedrczak, A., Beresford, M., & Clements, G. (1985). The TM-Sidhi program, pure consciousness, creativity and intelligence. *Journal of Creative Behavior*, 19, 270-275.
- Jedrczak, A., & Clements, G. (1984). The TM-Sidhi programme and field independence. *Perceptual and Motor Skills*, 59, 999-1000.
- Jedrczak, A., Toomey, M., & Clements, G. (1986). The TM-Sidhi programme, age, and brief tests of perceptual-motor speed and nonverbal intelligence. *Journal of Clinical Psychology*, 42, 161-164.
- Jevning, R., Pirkle, H.C., & Wilson, A.F. (1977). Behavioral alteration of plasma phenylalanine concentration. *Physiology and Behavior*, 19, 611-614.
- Jevning, R., Smith, R., Wilson, A.F., & Morton, M.E. (1976). Alterations in blood flow during Transcendental Meditation. *Psychophysiology*, 3, 168. (SPR Abstract No. 20)
- Jevning, R., Wells, I., Wilson, A.F., Guich, S. (1987). Plasma thyroid hormones, thyroid stimulating hormone, and insulin during acute hypometabolic states in man. *Physiology and Behavior*, 40, 603-606.
- Jevning, R., & Wilson, A.F. (1978). Behavioral increase of cerebral blood flow [Abstract]. *The Physiologist*, 21(4), 60.
- Jevning, R., Wilson, A.F., & Davidson, J.M. (1978). Adrenocortical activity during meditation. *Hormones and Behavior*, 10, 54-60.
- Jevning, R., Wilson, A.F., & O'Halloran, J.P. (1982). Muscle and skin blood flow and metabolism during states of decreased activation. *Physiology and Behavior*, 29, 343-348.
- Jevning, R., Wilson, A.F., O'Halloran, J.P., & Walsh, R.N. (1983). Forearm blood flow and metabolism during stylized and unstylized states of decreased activation. *American Journal of Physiology: Regulatory, Integrative and Comparative Physiology*, 14, R110-R116.
- Jevning, R., Wilson, A.F., Pirkle, H., Guich, S., and Walsh, R.N. (1985). Modulation of red cell metabolism by states of decreased activation: Comparison between states. *Physiology and Behavior*, 35, 679-682.
- Jevning, R., Wilson, A.F., Pirkle, H., O'Halloran, J.P., & Walsh, R.N. (1983). Metabolic control in a state of decreased activation: Modulation of red cell metabolism. *American Journal of Physiology: Cell Physiology*, 14, C457-C461.
- Jevning, R., Wilson, A.F., & Smith, W.R. (1978). The Transcendental Meditation

- technique, adrenocortical activity, and implications for stress. *Experientia*, 34, 618-619.
- Jevning, R., Wilson, A.F., Smith, W.R., & Morton, M.E. (1978). Redistribution of blood flow in acute hypometabolic behavior. *American Journal of Physiology*, 235(1): *Regulatory, Integrative and Comparative Physiology*, 4, R89-R92.
- Jevning, R., Wilson, A.F., & Vanderlaan, E.F. (1978). Plasma prolactin and growth hormone during meditation. *Psychosomatic Medicine*, 40, 329-333.
- Jonsson, C. (1975). *Organizational development through the Transcendental Meditation program: A study of relationships between the Transcendental Meditation program and certain efficiency criteria*. Unpublished master's thesis, Stockholm University.
- Kanellakos, D.P. (1978). Transcendental consciousness: Expanded awareness as a means of preventing and eliminating the effects of stress. In C.D. Spielberger & I.G. Sarason (Eds.), *Stress and anxiety: Vol. 5* (pp. 261-315). Washington, DC: Hemisphere Publishing Corp.
- Kember, P. (1985). The Transcendental Meditation technique and postgraduate academic performance. *British Journal of Educational Psychology*, 55, 164-166.
- Kember, P. (in press). The Transcendental Meditation technique and academic performance: A short report on a controlled longitudinal pilot study. *British Journal of Educational Psychology*.
- Kemmerling, T. (1978). Wirkung der Transzendentalen Meditation auf den Muskeltonus. *Psychopathometrie*, 4, 437-438.
- Kesterson, J.B. (1986). *Changes in respiratory control pattern during the practice of the Transcendental Meditation technique* (Doctoral dissertation, Maharishi International University, Fairfield, IA, 1986). *Dissertation Abstracts International*, 47, 4337B.
- Kniffki, C. (1979). Transzendente Meditation und Autogenes Training—Ein Vergleich [Transcendental Meditation and autogenic training: A comparison]. In the series *Geist und Psyche*. Munich: Kindler Verlag.
- Kobal, G., Wandhöfer, A., & Plattig, K.H. (1975). EEG power spectra and auditory evoked potentials in Transcendental Meditation (TM). *Pflugers Archiv*, 359, R 96. (Abstract No. 191)
- Kotchabhakdi, N.J., Pipatveravat, S., Kotchabhakdi, N., Tapanya, P., & Pornpathkul, S. (1982, 15-24 February). Improvement of intelligence, learning ability and moral judgment through the practice of the Transcendental Meditation technique. In *Proceedings of the Second Asian Workshop on Child and Adolescent Development*, Bangkok and Bangsaen, Thailand. Bangkok: Sri Nakharinwirot University.
- Krahne, W., & Taneli, B. (1975). EEG and Transcendental Meditation. *Pflugers Archive*, 359, R 95. (Abstract No. 190)
- Lang, R., Dehof, K., Meurer, K.A., & Kaufmann, W. (1979). Sympathetic activity and Transcendental Meditation. *Journal of Neural Transmission*, 44, 117-135.
- Levine, P.H. (1976). The coherence spectral array (COSPAR) and its application to the study of spatial ordering in the EEG. *Proceedings of the San Diego Biomedical Symposium*, 15, 237-247.
- Ljunggren, G. (1977). Inflytandet av Transcendental Meditation pa neuroticism, medicinbruk och sömnproblem. *Läkartidningen*, 74, 4212-4214.
- Lovell-Smith, H.D. (1982). Transcendental Meditation—treating the patient as well as the disease. *The New Zealand Family Physician*, 9, 62-65.
- Maharishi European Research University. (1984). *Maharishi Technology of the Unified Field: Integration of modern science and ancient Vedic Science*. Rheinweiler, W. Germany: Maharishi European Research University Press.
- Maharishi International University, (in press). *Scientific research on the Transcendental Meditation and TM-Sidhi program: Collected papers* (Vol. 5).
- Maharishi Mahesh Yogi. (1966). *The science of Being and art of living*. Livingston

- Manor, New York: Maharishi International University Press.
- Maharishi Mahesh Yogi. (1969). *Maharishi Mahesh Yogi on the Bhagavad Gita: A new translation and commentary, chapters 1-6*. Baltimore: Penguin Books.
- Maharishi Mahesh Yogi. (1976). *Creating an ideal society*. Rheinweiler, W. Germany: Maharishi European Research University Press.
- Maharishi Mahesh Yogi. (1978). *Enlightenment and invincibility*. Rheinweiler, W. Germany: Maharishi European Research University Press.
- Maharishi Mahesh Yogi. (1980, January). Keynote address (pp. 9-21); The structure of pure knowledge (pp. 73-80). In *Proceedings of the International Conference on Science, Consciousness, and Ageing*. Rheinweiler, W. Germany: Maharishi European Research University Press.
- Maharishi Mahesh Yogi. (1985). Inaugural address of His Holiness Maharishi Mahesh Yogi. In *Maharishi Vedic University Inauguration* (pp. 56-79). Washington, DC: Age of Enlightenment Press.
- Maharishi Mahesh Yogi. (1986). *Life supported by natural law*. Washington, DC: Age of Enlightenment Press.
- Marcus, S.V. (1977). The influence of the Transcendental Meditation program on the marital dyad (Doctoral dissertation, California School of Professional Psychology, Fresno, 1977). *Dissertation Abstracts International*, 38, 3895B.
- McCuaig, L.W. (1974). Salivary electrolytes, protein, and pH during Transcendental Meditation. *Experientia*, 30, 988-989.
- McEvoy, T.M., Frumkin, L.R., & Harkins, S.W. (1980). Effects of meditation on brainstem auditory evoked potentials. *International Journal of Neuroscience*, 10, 165-170.
- McIntyre, M.E., Silverman, F.H., & Trotter, W.D. (1974). Transcendental Meditation and stuttering: A preliminary report. *Perceptual and Motor Skills*, 39, 294.
- Mills, P.J., Schneider, R.H., Hill, D., Walton, K., & Wallace, R.K. (1987). Lymphocyte beta-adrenergic receptors and cardiovascular responsivity in TM participants and Type A behavior [Abstract]. *Psychosomatic Medicine*, 49, 211.
- Mills, W.W., & Farrow, J.T. (1981). The Transcendental Meditation technique and acute experimental pain. *Psychosomatic Medicine*, 43, 157-164.
- Monahan, R.J. (1977). Secondary prevention of drug dependence through the Transcendental Meditation program in metropolitan Philadelphia. *The International Journal of the Addictions*, 12, 729-754.
- Nagel, E. (1979). *The structure of science*. Indianapolis: Hackett Publishing Company.
- Nidich, R., & Nidich, S. (1985, April). *An empirical study of the moral atmosphere of Maharishi International University/University High School*. Paper presented at the annual meeting of the American Educational Research Association, Chicago.
- Nidich, S.I. (1975). A study of the relationship of Transcendental Meditation to Kohlberg's stages of moral reasoning (Doctoral Dissertation, University of Cincinnati, 1975). *Dissertation Abstracts International*, 36, 4361A-4362A.
- Nidich, S., Nidich, R., & Rainforth M. (1986). School effectiveness: Achievement gains at the Maharishi School of the Age of Enlightenment. *Education*, 107, 49-54.
- Nidich, S.I., & Orme-Johnson, D.W. (1982, September). *Kohlberg Stage 7, natural law, and the Transcendental Meditation and TM-Sidhi program*. Paper presented at the International Symposium on Moral Education, University of Fribourg, Fribourg, Switzerland.
- Nidich, S.I., Ryncarz, R.A., Abrams, A.I., Orme-Johnson, D.W., & Wallace, R.K. (1983). Kohlbergian cosmic perspective responses, EEG coherence, and the TM and TM-Sidhi programme. *Journal of Moral Education*, 12, 166-173.
- Nidich, S., Seeman, W., & Dreskin, T. (1973). Influence of Transcendental Meditation on self-actualization: A replication. *Journal of Counseling Psychology*,

- 20, 565-566.
- Nystul, M.S., & Garde, M. (1977). Comparison of self-concepts of Transcendental Meditators and nonmeditators. *Psychological Reports*, 41, 303-306.
- O'Halloran, J.P., Jevning, R.A., Wilson, A.F., Skowsky, R., Walsh, R.N., & Alexander, C.N. (1985). Hormonal control in a state of decreased activation: Potentiation of arginine vasopressin secretion. *Physiology and Behavior*, 35, 591-595.
- Orme-Johnson, D.W. (1973). Autonomic stability and Transcendental Meditation. *Psychosomatic Medicine*, 35, 341-349.
- Orme-Johnson, D.W. (1977). EEG coherence during transcendental consciousness. *Electroencephalography and Clinical Neurophysiology*, 43, 581-582. (Abstract No. E 487)
- Orme-Johnson, D.W. (1981). Prison rehabilitation and crime prevention through the Transcendental Meditation and TM-Sidhi program. In L.J. Hippchen (Ed.), *Holistic approaches to offender rehabilitation* (pp. 346-383). Springfield, IL: Charles Thomas Publishing.
- Orme-Johnson, D.W. (1987a, June). *Conflict resolution and improved quality of life through the Maharishi Technology of the Unified Field*. Paper presented at United Nations conference on Maharishi's Program to Create World Peace, Dag Hammarskjold Auditorium, United Nations, New York.
- Orme-Johnson, D.W. (1987b). Medical care utilization and the Transcendental Meditation program. *Psychosomatic Medicine*, 49, 493-507.
- Orme-Johnson, D.W. (1988). The Cosmic Psyche: An introduction to Maharishi Vedic Psychology: The fulfillment of modern psychology. *Modern Science and Vedic Science*, 2, 113-163 (in this issue).
- Orme-Johnson, D.W., Alexander, C.N., Davies, J.L., Chandler, H.M., & Larimore, W.E. (in press). International peace project in the Middle East: The effects of the Maharishi Technology of the Unified Field. *Journal of Conflict Resolution*.
- Orme-Johnson, D.W., & Dillbeck, M.C. (1982). Proposals to establish a U.S. Academy of Peace. In *Proceedings of the hearing before the Subcommittees on International Security and Scientific Affairs and on International Operations of the Committee on Foreign Affairs, and the Subcommittee on Postsecondary Education of the Committee on Education and Labor, House of Representatives, Ninety-Seventh Congress, Second Session, on bills H.R. 5088 and H.R. 6182* (pp. 241-250). Washington, DC: U.S. Government Printing Office.
- Orme-Johnson, D.W., & Dillbeck, M.C. (1987). Maharishi's Program to Create World Peace: Theory and research. *Modern Science and Vedic Science*, 1, 207-259.
- Orme-Johnson, D.W., Dillbeck, M.C., Wallace, R.K., & Landrith, G.S., III. (1982). Intersubject EEG coherence: Is consciousness a field? *International Journal of Neuroscience*, 16, 203-209.
- Orme-Johnson, D.W., & Farrow, J.T. (Eds.). (1976). *Scientific research on the Transcendental Meditation program: Collected papers* (Vol. 1). Rheinweiler, W. Germany: Maharishi European Research University Press.
- Orme-Johnson, D.W., & Gelderloos, P. (1988). Topographic EEG brain mapping during Yogic Flying. *International Journal of Neuroscience*, 38, 427-434.
- Orme-Johnson, D.W., Gelderloos, P., & Dillbeck, M.C. (in press). The effects of the Maharishi Technology of the Unified Field on the U.S. quality of life (1960-1984). *Social Science Perspectives Journal*.
- Orme-Johnson, D.W., & Haynes, C.T. (1981). EEG phase coherence, pure consciousness, creativity, and TM-Sidhi experiences. *International Journal of Neuroscience*, 13, 211-217.
- Orme-Johnson, D.W., & Vegors, S. (1988). Medical care utilization at Maharishi International University. *Journal of the Iowa Academy of Science*, 95(1), A56. (Abstract No. 244)
- Orme-Johnson, R.F. (1987). A unified field theory of literature. *Modern Science*

- and *Vedic Science*, 1, 323-373.
- Overbeck, K.D. (1982). Auswirkungen der Technik der Transzendentalen Meditation (TM) auf die psychische und psychosomatische Befindlichkeit. *Psychotherapie-Psychosomatik Medizinische Psychologie*, 32(6), 188-192.
- Pagano, R.R., & Frumkin, L.R. (1977). The effect of Transcendental Meditation on right hemispheric functioning. *Biofeedback and Self-Regulation*, 2, 407-415.
- Pelletier, K.R. (1974). Influence of Transcendental Meditation upon autokinetic perception. *Perceptual and Motor Skills*, 39, 1031-1034.
- Penner, W.J., Zingle, H.W., Dyck, R., & Truch, S. (1974). Does an in-depth Transcendental Meditation course effect change in the personalities of the participants? *Western Psychologist*, 4, 104-111.
- Pugh, N.D.C., Walton, K.G., and Cavanaugh, K.L. (1988). Do the numbers involved in the group practice of the TM and TM-Sidhi program affect the turnover rate of serotonin in the body? *Journal of the Iowa Academy of Science*, 95(1), A54. (Abstract No. 233)
- Schneider, R.H., Mills, P.J., Schramm, W., & Wallace, R.K. (1987). Luteinizing hormone: A marker for Type A behavior and its modification by the Transcendental Meditation program? [Abstract]. *Psychosomatic Medicine*, 49, 212-213.
- Schwartz, E. (1979). *The effects of the Transcendental Meditation program on strength of the nervous system, perceptual reactance, reaction time, and auditory threshold*. Unpublished master's thesis, University of Massachusetts, Amherst.
- Seeman, W., Nidich, S., & Banta, T. (1972). Influence of Transcendental Meditation on a measure of self-actualization. *Journal of Counseling Psychology*, 19, 184-187.
- Seiler, G., & Seiler, V. (1979). The effects of Transcendental Meditation on periodontal tissue. *Journal of the American Society of Psychosomatic Dentistry and Medicine*, 26 (1), 8-12.
- Shafii, M., Lavelly, R.A., & Jaffe, R.D. (1974). Meditation and marijuana. *American Journal of Psychiatry*, 131, 60-63.
- Shafii, M., Lavelly, R.A., & Jaffe, R.D. (1975). Meditation and the prevention of alcohol abuse. *American Journal of Psychiatry*, 132, 942-945.
- Shafii M., Lavelly, R., & Jaffe, R.D. (1976). Decrease in cigarette smoking following Transcendental Meditation [Abstract]. *MERU Journal*, 24, 29.
- Shecter, H. (1978). A psychological investigation into the source of the effect of the Transcendental Meditation technique (Doctoral dissertation, York University, Toronto, 1978). *Dissertation Abstracts International*, 38, 3372B-3373B.
- Sheppard, W.D.S., II. (1988). *Pretrial EEG coherence as a predictor of semantic processing effects*. Unpublished doctoral dissertation, Maharishi International University, Fairfield, IA.
- Smith, D.E., Glaser, J.L., & Dillbeck, M.C. (1987). Zero erythrocyte sedimentation rate (ESR) and the identification of a population with lower than predicted ESR values. *Age*, 10(4), 160. (Abstract No. 14)
- Suarez, V.W. (1976). *The relationship of the practice of Transcendental Meditation to subjective evaluations of marital satisfaction and adjustment*. Unpublished master's thesis, University of Southern California, Los Angeles.
- Subrahmanyam, S., & Porkodi, K. (1980). Neurohumoral correlates of Transcendental Meditation. *Journal of Biomedicine*, 1, 73-88.
- Swanson, G. (in press). Enlightened management: Building high-performance people. *Modern Science and Vedic Science*.
- Tabogi, S. (1983). *Effetti indotti dal programma di Meditazione Transcendentale sulla tolleranza glicidica*. Unpublished doctoral dissertation, Faculty of Medicine and Surgery, University of Trieste, Italy.
- Throll, D.A. (1978). *The effects of the Transcendental Meditation technique upon adolescent personality*. Unpublished master's thesis, Victoria University, Well-

- ington, New Zealand.
- Tjoa, A. (1975). Meditation, neuroticism and intelligence: A follow-up. *Cedrag: Tijdschrift voor Psychologia* [Behavior: Journal of Psychology], 3, 167-182.
- Travis, F. (1979). The Transcendental Meditation technique and creative thinking: A longitudinal study of Cornell University undergraduates. *Journal of Creative Behavior*, 13, 169-180.
- Travis, F.T. (1988a). Testing a field model of social interactions. *Journal of the Iowa Academy of Science*, 96(1), A56. (Abstract No. 247)
- Travis, F.T. (1988b). *Testing the field paradigm of Maharishi Vedic Psychology: EEG power and coherence as indices of states of consciousness and field effects*. Unpublished doctoral dissertation, Maharishi International University, Fairfield, IA.
- Travis, F.T., & Orme-Johnson, D.W. (1988). Comparison of EEG patterns during eyes-closed rest and the Transcendental Meditation technique [Abstract]. *Proceedings of the 60th Annual Meeting of the Midwest Psychological Association* (p. 56).
- Turnbull, M.J., & Norris, H. (1982). Effects of Transcendental Meditation on self-identity indices and personality. *British Journal of Psychology*, 73, 57-68.
- Wallace, R.K. (1970). Physiological effects of Transcendental Meditation. *Science*, 167, 1751-1754.
- Wallace, R.K., & Benson, H. (1972). The physiology of meditation. *Scientific American*, 226(2), 84-90.
- Wallace, R.K., Benson, H., & Wilson, A.F. (1971). A wakeful hypometabolic physiologic state. *American Journal of Physiology*, 221, 795-799.
- Wallace, R.K., Dillbeck, M., Jacobe, E., & Harrington, B. (1982). The effects of the Transcendental Meditation and TM-Sidhi program on the aging process. *International Journal of Neuroscience*, 16, 53-58.
- Wallace, R.K., Fagan, J.B., & Pasco, D.S. (1988). Vedic Physiology. *Modern Science and Vedic Science*, 2, 3-59.
- Wallace, R.K., Mills, P.J., Orme-Johnson, D.W., Dillbeck, M.C., & Jacobe, E. (1982). The paired H reflex and its correlation with EEG coherence and academic performance in normal subjects practicing meditation. *Society for Neuroscience Abstracts*, 8, 537.
- Wallace, R.K., Mills, P.J., Orme-Johnson, D.W., Dillbeck, M.C., & Jacobe, E. (1983). Modification of the paired H reflex through the Transcendental Meditation and TM-Sidhi program. *Experimental Neurology*, 79, 77-86.
- Wallace, R.K., Orme-Johnson, D.W., Mills, P.J., & Dillbeck, M.C. (1984). Academic achievement and the paired Hoffman reflex in students practicing meditation. *International Journal of Neuroscience*, 24, 261-266.
- Wallace, R.K., Silver, J., Mills, P.J., Dillbeck, M.C., & Wagoner, D.E. (1983). Systolic blood pressure and long-term practice of the Transcendental Meditation and TM-Sidhi program: Effects of TM on systolic blood pressure. *Psychosomatic Medicine*, 45, 41-46.
- Walton, K.G., Francis, D., Lerom, M., & Tourenne, C. (1983). Behaviorally-induced alterations in urinary 5-hydroxyindoles. *Transactions of the American Society for Neurochemistry*, 14, 199.
- Walton, K.G., Lerom, M., Salerno, J., & Wallace, R.K. (1981). Practice of the Transcendental Meditation (TM) and TM-Sidhi program may affect the circadian rhythm of urinary 5-hydroxyindole excretion. *Society for Neuroscience Abstracts*, 7, 48.
- Walton, K.G., McCorkle, T., Hauser, T., MacLean, C., Wallace, R.K., Ieni, J., & Meyerson, L.R. (1987). "Substance M," A serotonin modulator candidate from human urine? In Y.H. Ehrlich, R.H. Lenox, E. Kornecki, & W.O. Berry (Eds.), *Molecular mechanisms of neuronal responsiveness* (pp. 503-514). Vol. 221 of the series *Advances in experimental medicine and biology*. New York: Plenum

Publishing.

- Wandhöfer, A., Kopal, G., & Plattig, K.H. (1976). Latenzverkürzung menschlicher auditorisch evozierter Hirnpotentiale bei transzendentaler Meditation [Decrease of latency of human auditory evoked potentials during the Transcendental Meditation technique]. *Zeitschrift für Elektroenzephalographie und Elektromyographie*, 7, 99-103.
- Warner, T.Q. (1986). Transcendental Meditation and developmental advancement: Mediating abilities and conservation performance (Doctoral dissertation, York University, Toronto, 1986). *Dissertation Abstracts International*, 47, 3558B.
- Warshal, D. (1980). Effects of the Transcendental Meditation technique on normal and Jendrassik reflex time. *Perceptual and Motor Skills*, 50, 1103-1106.
- Weinless, M. (1987). The Samhita of sets: Maharishi's Vedic Science and the foundations of mathematics. *Modern Science and Vedic Science*, 1, 141-204.
- Werner, O.R., Wallace, R.K., Charles, B., Janssen, G., Styker, T., & Chalmers, R. A. (1986). Long-term endocrinologic changes in subjects practicing the Transcendental Meditation and TM-Sidhi program. *Psychosomatic Medicine*, 48, 59-66.
- Williams, P., & West, M. (1975). EEG responses to photic stimulation in persons experienced at meditation. *Electroencephalography and Clinical Neurophysiology*, 39, 519-522.
- Wilson, A.F., Honsberger, R.W., Chiu, J.T., & Novey, H.S. (1975). Transcendental Meditation and asthma. *Respiration*, 32, 74-80.
- Wilson, A.F., Jevning, R., & Guich, S. (1987). Marked reduction of forearm carbon dioxide production during states of decreased metabolism. *Physiology and Behavior*, 41, 347-352.
- Witkin, H.A., & Goodenough, D.R. (1977). Field dependence and interpersonal behavior. *Psychological Bulletin*, 84, 661-689.
- Wolkove, N., Kreisman, H., Darragh, D., Cohen, C., & Frank, H. (1984). Effect of Transcendental Meditation on breathing and respiratory control. *Journal of Applied Physiology: Respiratory, Environmental and Exercise Physiology*, 56, 607-612.