

Consciousness-Based Education: A Foundation for Teaching and Learning in the Academic Disciplines

A Series of 12 Volumes



MANAGING EDITOR, DARA LLEWELLYN
EXECUTIVE EDITOR, CRAIG PEARSON



2011



Consciousness-Based Books
Maharishi University of Management
Fairfield, Iowa 52557

VOLUME I

Consciousness-Based Education
and Maharishi Vedic Science



VOLUME EDITOR, FREDERICK TRAVIS



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Printed in the United States of America
Cover and book design by Shepley Hansen.

Published by
Consciousness-Based Books, an Imprint of
Maharishi University of Management Press
Fairfield, IA [www.mumpress.com]

Library of Congress Cataloging-in-Publication Data

Consciousness-based education : a foundation for teaching and learning in the academic disciplines / managing editor, Dara Llewellyn ; executive editor, Craig Pearson.

v. cm.

"A series of 12 volumes."

Includes bibliographical references.

Contents: Consciousness-based education and Maharishi Vedic science -- Consciousness-based education and education -- Consciousness-based education and physiology and health -- Consciousness-based education and physics -- Consciousness-based education and mathematics -- Consciousness-based education and literature -- Consciousness-based education and art -- Consciousness-based education and management -- Consciousness-based education and government -- Consciousness-based education and computer science -- Consciousness-based education and sustainability -- Consciousness-based education and world peace.

ISBN 978-0-923569-16-7 (v. 1) -- ISBN 978-0-923569-21-1 (v. 2) -- ISBN 978-0-923569-28-41-9 (v.3) -- 978-0-923569-44-0 (v.4) -- 978-0-923569-28-0 (v. 5, pt. 1) -- ISBN 978-0-923569-39-6 (v. 5, pt. 2) -- ISBN 978-0-923569-61-7 (v. 6) -- ISBN 978-0-923569-30-3 (v. 7) -- ISBN 978-0-923569-32-7 (v. 8) -- ISBN 978-0-923569-42-6 (v. 9) -- 978-0-923569-31-0 (v. 10) -- ISBN 978-0-923569-43-3 (v. 11) -- ISBN 978-0-923569-60-0 (v. 12)

1. Education, Higher--Philosophy. 2. Universities and colleges--Curricula--United States. 3. Maharishi University of Management--Curricula. 4. Transcendental Meditation. I. Llewellyn, Dara, 1947- II. Pearson, Craig, 1950-

LB2322.2.C67 2011

378.001--dc23

2010051616

ACKNOWLEDGEMENTS

Special acknowledgement goes to Ellen DeLashmutt for her contribution to the production of this volume of the *Consciousness-Based Education Book Series: Consciousness-Based Education: A Foundation for Teaching and Learning in the Academic Disciplines*. Recognition is also due the staff of the Maharishi University of Management Library for their reference, electronic, and archival support.

TABLE OF CONTENTS

Introduction to the Series	1
----------------------------------	---

Introduction to the Volume	13
----------------------------------	----

Section I: *Maharishi Vedic Science:* Introduction

1.1. Maharishi on Modern Science and <i>Vedic Science</i>	19
Maharishi Mahesh Yogi	

1.2. Introduction to <i>Maharishi Vedic Science</i>	25
Ken Chandler	

1.3. Technologies in Science and <i>Maharishi Vedic Science</i>	61
Christy Kleinschnitz	

1.4. Fundamental Principles of <i>Maharishi Vedic Science</i>	91
Patricia Oates	

Section II: *Maharishi Vedic Science:* Application

2.1. Dharma in the Valmiki Ramayan in the Light of <i>Maharishi Vedic Science and Technology</i>	141
William F. Sands	

2.2. Free Will and Determinism	189
Sam Boothby	

Section III:

Higher States of Consciousness:

Subjective Experience

3.1. King Janaka Questions Yagyavalka.....	217
Thomas Egenes	

3.2. Higher States of Consciousness.....	229
Patricia Oates	

3.3. Experiences of Growth of Consciousness in Undergraduate Students at Maharishi University of Management.....	261
Sue Brown	

Section IV:

Higher States of Consciousness:

Objective Research

4.1. Pure Consciousness: Distinct Phenomenological and Physiological Correlates of “Consciousness Itself”	293
Frederick Travis and Craig Pearson	

4.2. Autonomic Patterns during Respiratory Suspensions: Possible Markers of Transcendental Consciousness	311
Frederick Travis and Robert Keith Wallace	

TABLE OF CONTENTS

4.3. Electrophysiological Correlates of Higher States of Consciousness during Sleep in Long-Term Practitioners of the <i>Transcendental Meditation</i> Program.....	335
L.I. Mason, C.N. Alexander, F.T. Travis, G. Marsh, D.W. Orme-Johnson, J. Gackenbach, D.C. Mason, M. Rainforth and K.G. Walton	
4.4. Patterns of EEG Coherence, Power, and Contingent Negative Variation Characterize the Integration of Transcendental and Waking States.....	359
Frederick T. Travis, J. Teece, A. Arenander and R. K. Wallace	
4.5. Psychological and Physiological Characteristics of a Proposed Object-Referral/Self-Referral Continuum of Self-Awareness.....	401
Frederick Travis, Alarik Arenander, and David DuBois	
Resources.....	437

INTRODUCTION TO THE SERIES

Craig Pearson, Ph.D.
Executive Vice-President
Maharishi University of Management

Higher education faces a complex set of challenges today. We are seeing resources diminish at the same time we are hearing calls for greater access and affordability. Demands for greater transparency and accountability are being sounded by both the general public and the government. Government is exerting increasing controls in this long-independent area.

These challenges, however, are merely financial and political, and they are hardly limited to colleges and universities. The fundamental challenges are educational and center around the students themselves. Challenges include high levels of stress, pervasive substance abuse (particularly binge drinking), lack of preparedness for college-level work, and mental and emotional disabilities. In most of these areas, the problem is serious and worsening. Though colleges and universities are striving to address these challenges, few would claim we are turning the tide.

An encouraging trend is the increasing focus in higher education nationwide on promoting student learning. Yet these laudable efforts do not take into account the powerful forces working in opposition. It is well known that learning is inhibited by stress, sleep deprivation, alcohol, and poor diet—and these are among the most conspicuous features of the college student experience.

Something new is required. Education needs a reliable means of developing students directly from within. We need a systematic method for cultivating their creative intelligence, their capacity to learn, and their natural humanity. All education aims at these goals, of course—but the approach thus far has been from the outside in, and the results have been haphazard at best.

Consciousness-Based education was established to address this need. It integrates the best practices of education and places beneath them a proper foundation—direct development of the student from inside out.

The outcomes of Consciousness-Based education have been unprecedented and scientifically verified. These outcomes include significant

growth of intelligence, creativity, learning ability, field independence, ego development, and moral maturity, among others. These results are remarkable because many of these values typically plateau in adolescence—but Consciousness-Based education promotes this growth in students of all ages, developing potentials that otherwise would have remained unexpressed.

Beyond this rich cognitive growth, Consciousness-Based education significantly reduces student stress, boosts self-esteem, improves health, reduces substance use, and enhances interpersonal relationships. All of this comes together to create exceptional learning environments. This approach even measurably improves the quality of life in the surrounding society.

Consciousness-Based education was founded by Maharishi Mahesh Yogi, the world authority on the science of consciousness. First pioneered at Maharishi University of Management in Fairfield, Iowa, Consciousness-Based education is being adopted by schools, colleges, and universities around the world. It is easily integrated into any school, without any change in mission or curriculum.

Consciousness-Based education recognizes that student learning depends fundamentally on students' levels of consciousness or alertness. The more alert and awake the student, the more successful and satisfying the learning.

Consciousness-Based education consists of three components:

- a practical technology for directly developing students' potential from within,
- a theoretical understanding of consciousness that gives rise to a unifying framework for knowledge, enabling students to easily grasp the fundamental principles of any discipline and to connect these principles to their own personal growth, and
- a set of classroom practices, arising from this understanding, that also help promote effective teaching and learning.

The *Transcendental Meditation* program

At the heart of Consciousness-Based education is the practice of the Transcendental Meditation technique. The technique was brought to light by Maharishi Mahesh Yogi from the Vedic tradition of India, the world's most ancient continuous tradition of knowledge. It is practiced for 20 minutes twice daily, once in the morning and once in the afternoon, while sitting comfortably with eyes closed. It is simple, natural, and effortless—so simple, in fact, that ten-year-old children can learn and practice it. It has been learned by more than six million people worldwide, of all ages, religions, and cultures.

The Transcendental Meditation technique differs from other procedures of meditation and relaxation in its effortlessness. It involves no concentration or control of the mind. Neither is it a religion, philosophy, or lifestyle. It involves no new codes of behavior, attitudes, or beliefs, not even the belief it will work.

The Transcendental Meditation program is the most extensively validated program of personal development in the world. It has been the subject of more than 600 scientific research studies, conducted at more than 250 universities and research institutions in more than 30 countries worldwide. These studies have been published in more than 150 scientific and scholarly journals in a broad range of fields, including *Science*, *Scientific American*, *American Journal of Physiology*, *International Journal of Neuroscience*, *Memory and Cognition*, *Social Indicators Research*, *Intelligence*, *Journal of Mind and Behavior*, *Education*, *Journal of Moral Education*, *Journal of Personality and Social Psychology*, *Business and Health*, *British Journal of Educational Psychology*, *Journal of Human Stress*, *Lancet*, *Physiology and Behavior*, and numerous others. No approach to education has as much empirical support as Consciousness-Based education.

This approach, moreover, has been successfully field-tested over the past 35 years in primary, secondary, and post-secondary schools all over the world, in developed and developing nations, in a wide variety of cultural settings—the United States, Latin America, Europe, Africa, India, and China.

The Transcendental Meditation technique enables one to “dive within.” During the practice, the mind settles inward, naturally and spontaneously, to a state of deep inner quiet, beyond thoughts and per-

ceptions. One experiences consciousness in its pure, silent state, uncolored by mental activity. In this state, consciousness is aware of itself alone, awake to its own unbounded nature.

The technique also gives profound rest, which dissolves accumulated stress and restores balanced functioning to mind and body.

This state of inner wakefulness coupled with deep rest represents a fourth major state of consciousness, distinct from the familiar states of waking, dreaming, and sleeping, known as Transcendental Consciousness.

In this restfully alert state, brain functioning becomes highly integrated and coherent. EEG studies show long-range spatial communication among all brain regions. This coherence is in sharp contrast to the more or less uncoordinated patterns typical of brain activity.

With regular practice, this integrated style of functioning carries over into daily activity. Research studies consistently show a high statistical correlation between brainwave coherence and intelligence, creativity, field independence, emotional stability, and other positive values. The greater one's EEG coherence, in other words, the greater one's development in these fundamental areas. At Maharishi University of Management, students even have the option of a Brain Integration Progress Report—an empirical measure of growth of EEG coherence between their first and last years at the University.

The brain is the governor of all human activity—and therefore personal growth and success in any field depend on the degree to which brain functioning is integrated. The increasingly integrated brain functioning that spontaneously results from Transcendental Meditation practice accounts for its multiplicity of benefits to mind, body, and behavior.

Every human being has the natural ability to transcend, to experience the boundless inner reality of life. Every human brain has the natural ability to function coherently. It requires only a simple technique.

Theoretical component— a unified framework for teaching and learning

Scholars have long called for a way to unify the diverse branches of knowledge. Current global trends are making this need ever more

apparent. The pace of progress is accelerating, the knowledge explosion continues unabated, and knowledge is becoming ever more specialized.

Academic disciplines offer a useful way of compartmentalizing knowledge for purposes of teaching, learning, research, and publication. But each academic discipline explores only one facet of our increasingly complex and interrelated world. The real world, however, is not compartmentalized—an elephant is not a trunk, a tusk, and a tail. Academic disciplines, consequently, are criticized as inadequate, in themselves, for understanding and addressing today's challenging social problems.

Today, more than ever, we need a means of looking at issues comprehensively, holistically. We need a way of discovering and understanding the natural relationships among all the complex elements that compose the world, even among the complex elements that compose our own disciplines.

Various attempts to address this need have been made under the rubric of interdisciplinary studies—programs or processes that aim to synthesize the perspectives and promote connections among multiple disciplines. Some of these efforts have been criticized as superficial joinings of disciplinary knowledge. But the chief criticism of interdisciplinary studies—leveled even by its proponents—is that looking at an issue from multiple perspectives does not, in itself, enable one to find the common ground among contrasting viewpoints, to resolve conflicts, and to arrive at a coherent understanding.

The diverse academic disciplines can be properly unified at only one level—at their source. All academic disciplines are expressions of human consciousness—and if the fundamental principles of consciousness can be identified and understood, then one would gain a grasp of all human knowledge in a single stroke.

This brings us to the theoretical component of Consciousness-Based education. Consciousness-Based education does precisely this—and not as an abstract, theoretical construct but as the result of students' direct experience of their own silent, pure consciousness. In this sense, practice of the Transcendental Meditation technique forms the laboratory component of Consciousness-Based education, where the theoretical predictions of Consciousness-Based education can be verified through direct personal experience.

This theoretical component offers a rich and deep yet easy-to-grasp intellectual understanding of consciousness—its nature and range, how it may be cultivated, its potentials when fully developed. This theoretical component also identifies how the fundamental dynamics of consciousness are found at work in every physical system and in every academic discipline at every level.

With this knowledge as a foundation, teachers and students in all disciplines enjoy a shared and comprehensive understanding of human development and a set of deep principles common to all academic disciplines—a unified framework for knowledge. With this unified framework as a foundation, students can move from subject to subject, discipline to discipline, and readily understand the fundamental principles of the discipline and recognize the principles the discipline shares with the other disciplines they have studied. This approach makes knowledge easy to grasp and personally relevant to the student.

Pure consciousness and the unified field

Consciousness has traditionally been understood as the continuous flux of thoughts and perceptions that engages the mind. Thoughts and perceptions, in turn, are widely understood to be merely the by-product of the brain's electrochemical functioning.

Maharishi has put forward a radically new understanding of human consciousness. In Consciousness-Based education, pure consciousness is understood as the foundation and source of all mental activity, the most silent, creative, and blissful level of the mind—the field of one's total inner intelligence, one's innermost Self. (This unbounded value of the Self is written with an uppercase "S" to distinguish it from the ordinary, localized self we typically experience.) Direct experience of this inner field of consciousness awakens it, enlivens its intrinsic properties of creativity and intelligence. Regular experience of pure consciousness through the Transcendental Meditation technique leads to rapid growth of one's potential, to the development of higher states of human consciousness—to *enlightenment*.

But consciousness is more, even, than this.

Throughout the 20th century, leading physicists conjectured upon the relation between mind and matter, between consciousness and the physical world; many expressed the conviction that mind is, somehow,

the essential ingredient of the universe. But Maharishi goes further. He has asserted that mind and matter have a common source, and that this source is pure consciousness. Consciousness in its pure, silent state is identical with the most fundamental level of nature's functioning, the unified field of natural law that has been identified and described by quantum theoretical physicists over the past several decades. Everyone has the potential to experience this field in the simplest form of his or her own awareness. Considerable theoretical evidence, and even empirical evidence, has been put forward in support of this position.

Maharishi has developed these ideas in two bodies of knowledge, the first known as the Science of Creative Intelligence, the second as Maharishi Vedic Science and Technology. The Science of Creative Intelligence examines the nature and range of consciousness and presents a model of human development that includes seven states of consciousness altogether, including four higher states beyond the familiar states of waking, dreaming, and sleeping. These higher states, which develop naturally and spontaneously with Transcendental Meditation practice, bring expanded values of experience of one's self and the surrounding world. Each represents a progressive stage of enlightenment. Maharishi Vedic Science and Technology examines the dynamics of pure consciousness in fine detail. It reveals the fundamental principles of consciousness that may then be identified in every field of knowledge and every natural system.

Most important for teaching and learning, these sciences reveal how every branch of knowledge emerges from the field of pure consciousness and how this field is actually the Self of every student.

Strategies for promoting teaching and learning

Consciousness-Based education also includes a battery of educational strategies that promote effective teaching and learning. Foremost among these is the precept that parts are always connected to wholes and that learning is most effective when learners are able to connect parts to wholes. In Consciousness-Based education, the parts of knowledge are always connected to the wholeness of knowledge, and the wholeness of knowledge is connected to the Self of the student.

One means of doing this is through *Unified Field Charts*. These wall charts, developed by the faculty at Maharishi University of Manage-

ment and used in every class, do three things: (1) They show all the branches of the discipline at a glance. (2) They show how the discipline emerges from the field of pure consciousness, the unified field of natural law at the basis of the universe. (3) They show that this field is the Self of the student, which the student experiences during practice of the Transcendental Meditation technique.

In this way students can always see the relation between what they are studying and the discipline as a whole, and they can see the discipline as an expression of their own pure consciousness. Again, this is more than an intellectual formulation—it is the growing reality of students' experience as they develop higher states of consciousness.

Another strategy is *Main Point Charts*. Developed by the faculty for each lesson and posted on the classroom walls, these charts summarize in a few sentences the main points of the lesson and their relationship to the underlying principles of consciousness. In this way students always have the lesson as a whole in front of them, available at a glance.

The next paradigm shift

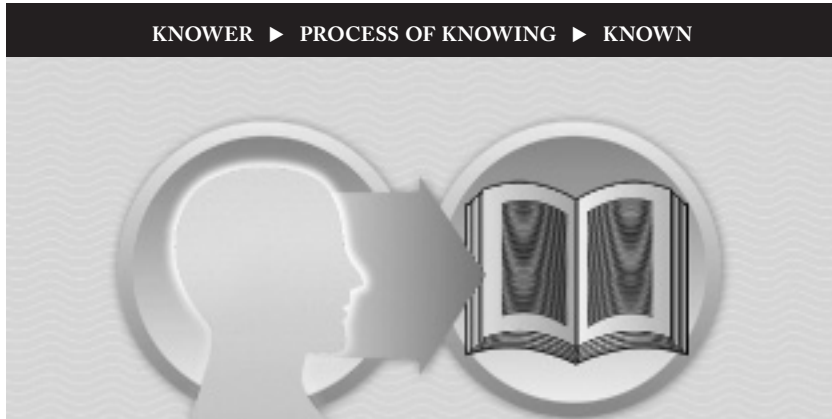
If higher education is fundamentally about student learning and growth, then Consciousness-Based education represents a major paradigm shift in the history of education. To understand this change, it is useful to reflect on the encouraging paradigm shift that has already been taking place in education over the past several decades.

This shift involves a move from what many call an *instruction paradigm* to a *learning paradigm*. In the instruction paradigm, the mission of colleges and universities is to provide instruction; this is accomplished through a transfer of knowledge from teacher to student. In the learning paradigm, the mission is to produce student learning; this mission is achieved by guiding students in the discovery and construction of knowledge.

This shift is a vitally important advance in education, leading to more successful outcomes and more rewarding experiences for students and teachers alike. But a further paradigm shift remains, and we can understand it by examining a fundamental feature of human experience.

Maharishi observes that every human experience consists of three fundamental components: a knower, a known, and a process of knowing linking knower and known. We may also use the terms experi-

encer, object of experience, and process of experiencing, or observer, observed, and process of observation.



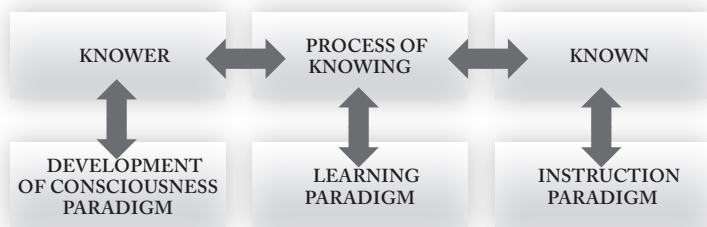
This three-fold structure of experience is nowhere more evident than in schools: The knowers are the students, the known is the knowledge to be learned, and the process of knowing is what the full range of teaching and learning strategies seek to promote.

Understanding this three-fold structure helps us understand the paradigm shifts that are taking place.

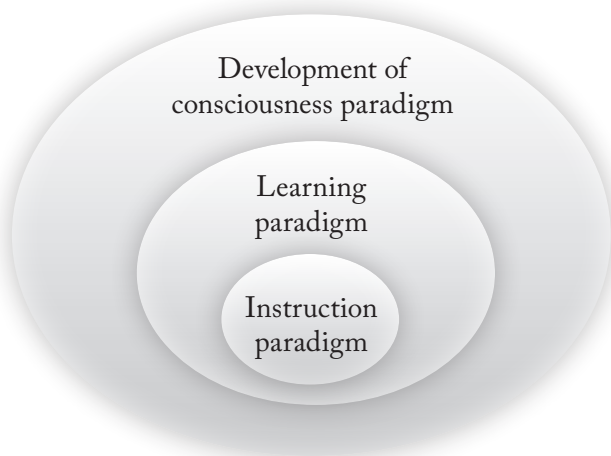
The instruction paradigm places emphasis on the known. It focuses on the information students are to absorb and the skills they are to learn. In this paradigm, the instructor's role is to identify what students need to know and deliver it to them.

The learning paradigm emphasizes the process of knowing. It recognizes that students must be actively involved in the learning process, that knowledge is something individuals create and construct for themselves, that students have differing learning styles and differing interests that must be taken into account. In this paradigm, the instructor's role is to create learning environments and experiences that promote the process of learning.

The Consciousness-Based paradigm embraces the known and the process of knowing but places primary emphasis on the knower—on developing the knower's potential for learning from within. The following diagram shows the respective emphases of each approach:



But the learning paradigm does not so much abandon the instruction paradigm as enlarge it, so that it includes the process of knowing as well as the known. And the Consciousness-Based approach completes the enlargement to include the knower:



Consciousness-Based education, in summary, is a theory and practice grounded in a systematic science and technology of consciousness, making available the complete experience, systematic development, and comprehensive understanding of the full range of human consciousness. More than 30 years' experience and extensive scientific research confirm the success of this approach and its applicability to any educational institution.

About this book series

This series of twelve volumes is the result of a unique faculty-wide project that began with the founding of Maharishi University of Management in 1971 and continues to this day. Each volume in the series examines a particular academic discipline in the light of our Consciousness-Based approach to education.

Volumes include:

- an introductory paper introducing the Consciousness-Based understanding of the discipline,
- a Unified Field Chart, if available for publication, for the discipline—a chart that conceptually maps all the branches of the discipline and illustrates how the discipline emerges from the field of pure consciousness and how that field is the Self of every individual. Thus, these charts connect the “parts” of knowledge to the “wholeness” of knowledge and the wholeness of knowledge to the Self of the student;
- subsequent papers that show how this understanding may be applied in various branches of the discipline,
- occasional examples of student work exploring how the Consciousness-Based approach enhances learning in the discipline, and
- an appendix describing Maharishi Vedic Science and Technologies of Consciousness in detail (appears in this volume as the second article in Section I).

VOLUME	DISCIPLINE	VOLUME EDITOR
1	Maharishi Vedic Science	Frederick Travis
2	Education	Christopher Jones
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INTRODUCTION TO THE VOLUME

Frederick Travis, Ph.D.
Volume Editor

This volume describes a discipline, Maharishi Vedic Science, that is the core of Consciousness-Based education. Maharishi Vedic Science studies the full range of human consciousness—from a self-interacting field of intelligence and creativity at the basis of life to its expressions in the orderly functioning of nature, studied by the objective approach of science, and in the full range of human experiences, studied in the subjective approach of Vedic Science.

The first section of this volume introduces and defines fundamental principles of Maharishi Vedic Science. The second section examines religion, social structures, and the concept of free will in relation to these principles. The last two sections present subjective experiences and empirical tests of higher states of consciousness as described in Maharishi Vedic Science. Higher states of consciousness are fundamental to and exist beyond the usual experience of waking, sleeping and dreaming.

Section One

In section one, articles describe the relation of subjective and objective approaches of science. While the objective approach of modern science looks outside and explores laws guiding observable behavior, the subjective approach of Vedic Science looks inside and explores laws guiding the systematic functioning of consciousness. Maharishi Vedic Science includes both of these approaches, creating a “complete science.” This section begins with an article by Maharishi Mahesh Yogi, the founder of Maharishi Vedic Science. In this article, Maharishi states:

Vedic Science is a complete science, which extends and fulfills the objective approach of modern science by incorporating the knower and the process of knowing into the field of investigation. It provides a complete and comprehensive knowledge of the Unified Field of all the Laws of Nature, which can best be described as the unified state of the knower, the known, and the process of knowing. Vedic Science also describes the sequential mechanics through which this three-in-one structure of

the Unified Field gives rise to the infinite range and diversity of Natural Law displayed in the universe.

The next article, written by Ken Chandler, also discusses the scientific character of Maharishi Vedic Science:

The name Vedic Science thus indicates both the ancient traditional origins of this body of knowledge and the modern commitment to experience, system, testability, and the demand that knowledge be useful in improving the quality of human life.

The article by Christy Kleinschnitz continues this discussion:

Complete knowledge, Maharishi explains, is available in his Vedic Science, which integrates subjective and objective methods. The subjective approach, or knowledge of the knower, is the basic foundation of this science.

This paper also discusses the Vedic technologies that develop higher states of consciousness including: the Transcendental Meditation technique, the TM-Sidhi program, and reading Vedic literature. The last article in this section by Patricia Oates delineates fundamental principles set forth in Maharishi Vedic Science including the nature of pure, self-referral consciousness, Veda and Vedic literature as the self-referral structure of pure consciousness, and the structural and functional similarity of Veda to the unified field of physics.

Section Two

In the second section, articles apply the principles of Maharishi Vedic Science to fundamental areas, including social structures and the question of freewill and determinism. The first article, by William F. Sands, discusses social progress in light of principles of Maharishi Vedic Science. Sands discusses the concept of *dharma*, which modern scholars generally hold to be the collective mores of the ancient Indian social structure. Maharishi Vedic Science, as delineated in the Vedic text called the *Ramayana*, describes *dharma* as the total potential of natural law, which includes the innumerable laws of nature that promote individual and social progress. The second article in this section, by Sam Boothby, discusses in what sense could man have free will if evolution is considered to be completely determined. Boothby concludes his paper:

In essence, Maharishi defines free will as the ability to engage in action that promotes maximum speed of evolution in the face of non-evolutionary influences from one's inner or outer environment. He further explains, however, that on the path of gaining cosmic consciousness, free will is not an absolute value. Rather, the amount of free will a person has—that is, the amount of freedom he has to act on what he knows to be right—is a function of how much creative intelligence has been stabilized in his awareness.

Section Three

Articles in the third and fourth sections discuss the subjective experiences and empirical tests of higher states of consciousness available through Maharishi Vedic Science. The third section begins with a discussion between a father, who is living enlightenment, and his son. This is translated from the Upanishads by Tom Egenes. The Upanishads are the aspects of Vedic literature that deal with one's universal nature as distinct from one's personality or individual thoughts, feelings and preferences. The next article by Patricia Oates systematically discusses the hierarchical structure of higher states of consciousness, defined in Maharishi Vedic Science. The last article in this section is written by Sue Brown, based on her doctoral research on growth of higher states of consciousness in students in Consciousness-Based education. These descriptions of higher states are from graduating seniors at Maharishi University of Management.

Section Four

The fourth and final section presents papers by Fred Travis, published in peer-reviewed journals that empirically characterize states of consciousness. The first two papers report subjective experiences of Transcendental Consciousness, and associated brain patterns during this experience of pure self-referral awareness gained during Transcendental Meditation practice. The next three papers discuss brain patterns in the first stabilized state of enlightenment described in Maharishi Vedic Science, called Cosmic Consciousness. One paper discusses brain patterns during sleep in individuals experiencing characteristics of Cosmic Consciousness. In these individuals, the EEG patterns of Transcendental Meditation practice are seen during deep sleep. The next paper

reports that brain patterns seen during the practice of the Transcendental Meditation technique are also seen during tasks in individuals reporting Cosmic Consciousness.. The last paper discusses results from interviews, psychological tests and brain patterns in these individuals during the experience of Cosmic Consciousness.

This volume only touches the surface of Maharishi Vedic Science. For a deeper discussion of Maharishi Vedic Science and related principles, interested readers could read *Maharishi Mahesh Yogi on the Bhagavad-Gita: A New Translation and Commentary with Sanskrit Text, Chapters 1-6* (Penguin Arkana 1990), Maharishi's *Maharishi Vedic University: Opening a New Gate for Fulfillment to all Mankind* (1985), or the book *Human Physiology: Expression of Veda and the Vedic Literature: Modern Science and Ancient Science Discover the Fabrics of Immortality in the Human Physiology*, by Dr. Tony Nader.

Section I



Maharishi Vedic Science:

Introduction

Maharishi on Modern Science and *Vedic Science*

■

Maharishi Mahesh Yogi

ABOUT THE AUTHOR

Maharishi Mahesh Yogi, a great Vedic sage, brought to light the knowledge of ancient Vedic Science and integrated it with modern sciences so that Vedic Science and modern science are now seen as complementary methods of gaining knowledge of the same reality—the unified field of all the laws of nature. This knowledge, known as Maharishi Vedic Science, gives complete knowledge of consciousness of the knower, complete knowledge of the object known, and complete knowledge of the process of knowing. In knowing the unified field, all three—knower, known, and process of knowing—are united in a single unified state of knowledge in which the three are one and the same—pure consciousness. In 1971, Maharishi founded Maharishi University of Management to offer Consciousness-Based education to the world. This approach to education enables students to discover the field of pure consciousness within themselves as the source of all knowledge and to explore the academic disciplines in the light of this knowledge.

ABSTRACT

Vedic Science is the science of Veda. “Veda” means pure knowledge and the infinite organizing power that is inherent in the structure of pure knowledge. Pure knowledge is the state of awareness in which consciousness knows itself alone, when awareness is completely self-referral, when awareness has nothing other than itself in its structure. This state of pure knowledge, when knower, known, and process of knowing are in the self-referral, is that all-powerful, immortal, infinite dynamism at the unmanifest basis of creation. This is Vedic Science—all about the knower, the known, and the process of knowing; all about consciousness, both in its self-referral, self-interacting state, and as it expresses itself in the infinite variety of the whole creation, that performance of nature which goes on and on eternally in all spheres of time, past, present, and future. The knowledge of this most basic principle of life—the self-interacting dynamics of consciousness—is the science of pure knowledge, the science of Veda.

Human awareness can identify itself with this most basic, self-referral value of consciousness in the state of *samadhi*, or Transcendental Consciousness. This state is easily gained and most naturally enjoyed through Transcendental Meditation. The functioning of transcendental pure consciousness is the functioning of the natural law in its most settled state. The conscious human mind, identifying itself with this level of nature’s functioning, gains the ability to perform in the style with which nature performs its activity at its most fundamental level. Completely identified in transcendental consciousness with the full potential of natural law, the human mind is a field of all possibilities, spontaneously functioning in harmony with all the laws of nature, and able to accomplish anything. This is how human life will be cultured through Vedic Science.

What is the difference between Vedic Science and 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 the field of the known, but does not

touch at all the field of the knower and the spontaneous process of knowing.

Vedic Science is a complete science, which extends and fulfills the objective approach of modern science by incorporating the knower and the process of knowing into the field of investigation. It provides a complete and comprehensive knowledge of the unified field of all the laws of nature, which can best be described as the unified state of the knower, the known, and the process of knowing. Vedic Science also describes the sequential mechanics through which this three-in-one structure of the unified field gives rise to the infinite range and diversity of natural law displayed in the universe.

The knowledge of the unified field has been discovered by modern science during just the last few years, but complete knowledge of the unified field has always been available in the Vedic literature. Today quantum physics has glimpsed the details of the unified field and is locating its three-in-one structure. This is precisely the three-in-one structure of the self-referral state of consciousness.

Credit must be given to modern science because its objective approach has now uncovered the reality of pure subjectivity. The world of science should know, however, that the objective approach comes to an end there. Many more discoveries may be made on the surface, relative levels of existence, but the goal of physics has been reached.

Today the most advanced level of modern science needs a complete approach to investigation, which includes the two other values of knowledge—the value of the knower and the value of the process of knowing. All three values are uncovered in their totality in Vedic Science.

If progress is to continue, a shift is required from the science of only one category to a total science. Vedic Science is that total science. It uncovers the knowledge of the total potential of natural law in its completeness and brings human awareness in tune with those fine creative impulses that are engaged in transforming the field of intelligence into the field of matter.

The approach of Vedic Science is such that the knowledge gained enlivens that most fundamental value of consciousness from where all thoughts and actions emerge. Therefore, the very methodology of gaining knowledge through Vedic Science is such that as one gains the

knowledge of natural law on the intellectual level, one begins to live that natural law in daily life in a most spontaneous way. This is the basis of the practical application of Vedic Science.

Vedic Science is applied through the Technology of the Unified Field. We speak of the unified field in connection with Vedic Science because of the similarity between what has been discovered by physics and what exists in the self-referral state of human consciousness. The Technology of the Unified Field is a purely scientific procedure for the total development of the human psyche, the total development of the human race. This is the time when objective, science-based progress in the world is being enriched by the possibility of total development of human life on earth, and that is the reason why we anticipate the creation of a unified field based ideal civilization.

From a lecture on Vedic Science

By Maharishi Mahesh Yogi

This article, "Maharishi on Modern Science and Vedic Science," was published in *Modern Science and Vedic Science*, 2(3) 1988, pp. i–iii. It is reprinted here with permission.

Modern Science and *Vedic Science*:
An Introduction



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(The following article served as the Introduction to the inaugural issue of the journal *Modern Science and Vedic Science*.)

Modern Science and *Vedic Science*:

An Introduction

This journal (*Modern Science and Vedic Science*) provides a forum for research on the forefront of mankind's expanding knowledge of the universe. It is devoted to exploration of the unified field of all the laws of nature through the combined approaches of modern science and ancient Vedic science, as brought to light by Maharishi Mahesh Yogi. The identification of the unified field by modern physics is only the first glimpse of a new area of investigation that underlies all disciplines of knowledge, and which can be explored not only through objective science but through a new technology of consciousness developed by Maharishi.

The unified field is now beginning to be understood through modern physics as the unified source of the entire universe, as a unified state of all the laws of nature from which all force and matter fields sequentially emerge according to exact dynamical principles. As each science and each academic discipline progresses to uncover its own most basic laws and foundational principles, each is beginning to discover that the roots of these laws and principles can be traced to the unified field.

This journal recognizes a new method of gaining knowledge of the unified field that combines the approach of the modern sciences with that of the most ancient of sciences, the ancient tradition of Vedic science. Many thousands of years ago, the seers of the Himalayas discovered, through exploration of their silent levels of awareness, a unified field where all the laws of nature are found together in a state of wholeness. This unity of nature was directly experienced to be a self-referral state of consciousness which is unbounded, all-pervading, unchanging, and the self-sufficient source of all existing things. They experienced and gave expression to the self-interacting dynamics through which this unified field sequentially gives rise to the diversity of all laws of nature. That experience is expressed in the ancient Vedic literature.

In our own time, Maharishi has brought to light the knowledge of this ancient science and integrated it with the modern sciences in such a way that Vedic science and modern science are now seen as complementary methods of gaining knowledge of the same reality—the unified field of all the laws of nature. The knowledge of this ancient science that Maharishi has brought to light is known as Maharishi Vedic Science.

Maharishi Vedic Science is to be understood, first of all, as a reliable method of gaining knowledge, as a science in the most complete sense of the term. It relies upon experience as the sole basis of knowledge, not experience gained through the senses only, but experience gained when the mind, becoming completely quiet, is identified with the unified field. This method, examined in relation to the modern sciences, proves to be an effective means of exploring the unified field of all the laws of nature. On the basis of this method, complete knowledge of the unified field becomes possible. It is possible to know the unified field both subjectively on the level of direct experience through exploration of consciousness and objectively through the investigative methods of modern science. Maharishi Vedic Science gives complete knowledge of consciousness, or the knower, complete knowledge of the object known, and complete knowledge of the process of knowing. In knowing the unified field, all three—knower, known, and process of knowing—are united in a single unified state of knowledge in which the three are one and the same.

Maharishi has developed and made available a technology for the systematic exploration of the unified field. This technology is a means by which anyone can gain access to the unified field and explore it through experience of the simplest and most unified state of consciousness. As this domain of experience becomes universally accessible, the unified field becomes available as a direct experience that is a basis for universal knowledge. The technology for gaining access to the unified field is called the Transcendental Meditation technique and its advanced programs, and the science based on this experience, which links modern science and Maharishi Vedic Science in a single unified body of knowledge, is called the Science of Creative Intelligence.

Maharishi is deeply committed to applying the knowledge and technology of the unified field for the practical benefit of life. He has

developed programs to apply this knowledge to every major area of human concern, including the fields of health, education, rehabilitation, and world peace. These applications of Maharishi's technologies of consciousness have laid it open to empirical verification and demonstrated its practical benefit to mankind. Hundreds of scientific studies have already established its usefulness. From these results, it is clear that Maharishi's technologies of consciousness are far more beneficial than technologies based on present day empirical science; they promise to reduce and even eliminate war, terrorism, crime, ill health, and all forms of human suffering.

These technologies, which are the applied value of Maharishi Vedic Science, represent a great advance in methods for gaining knowledge. Past science was based on a limited range of knowledge gained through the senses. This new technology opens to mankind a domain of experience of a deeper and more far-reaching import. It places within our grasp a new source of discovery of laws of nature that far exceeds the methods of modern science, yet remains complementary to these methods.

Modern science and Maharishi Vedic Science, explored together, constitute a radically new frontier of knowledge in the contemporary world, opening out vistas of what it is possible for mankind to know and to achieve, which extend far beyond present conceptions, and which demand a re-evaluation of current paradigms of reality and a reassessment of old conceptions of the sources and limits of human knowledge.

This introductory essay will provide a preliminary understanding of what the unified field is, what Maharishi Vedic Science is, and how Maharishi Vedic Science and modern science are related. It also defines fundamental concepts and terminology that will be frequently used in this journal and surveys the practical applications of this new technology. We begin with a description of the unified field as understood in modern science.

The Unified Field of Modern Science

Within the last few years, modern theoretical physics has identified and mathematically described a unified field at the basis of all observable states of physical nature. Einstein's hope of finding a unified field theory to unite the electromagnetic, gravitational, and other known

force fields has now been virtually realized in the form of unified quantum field theories. Instead of having several irreducible and distinct force fields, physics can now mathematically derive all four known force fields from a single supersymmetric field located at the Planck scale (10^{-33} cm or 10^{-43} sec.), the most fundamental time-distance scale in nature. This field constitutes an unbounded continuum of non-changing unity pervading the entire universe. All matter and energy in the universe are now understood to be just excitations of this one, all-pervading field.

Physics now has the capacity to describe accurately the sequence by which the unified field of natural law systematically gives rise, through its own self-interacting dynamics, to the diverse force and matter fields that constitute the universe. With a precision almost undreamed of a few years ago, the modern science of cosmology can now account for the exact sequence of dynamical symmetry breaking by which the unified field, the singularity at the moment of cosmogenesis, sequentially gave rise to the diverse force fields and matter fields. It is now possible to determine the time and sequence in which each force and matter field decoupled from the unified field, often to within a precision of minute fractions of a second. This gives us a clear understanding of how all aspects of the physical universe emerge from the unified field of natural law.

Mathematics, physiology, and other sciences have also located a unified source and basis of all the laws of nature in their respective disciplines. In mathematics, the foundational area of set theory provides an account of the sequential emergence of all of mathematics out of the single concept of a set and the relationship of set membership. The iterative mechanics of set formation at the foundation of set theory directly present the mechanics of an underlying unified field of intelligence that is self-sufficient, self-referral, and infinitely dynamic in its nature. Investigations into the foundations of set theory are ultimately investigations of this unified field of intelligence from which all diversity of the discipline emerge in a rigorous and sequential fashion. In physiology, it is the DNA molecule that contains, either explicitly or implicitly, the information specifying all structures and functions of the individual physiology. In this sense, therefore, it is DNA that unifies the discipline by serving as a unified source to which the diversity of physiological functioning can be traced.

Each of the modern sciences may indeed be said to have glimpsed a unified state of complete knowledge in which all laws of nature are contained in seed form. Each has gained some knowledge of how the unified field of natural law sequentially unfolds into the diverse expressions of natural law constituting its field of study. Modern science is now discovering and exploring the fundamental unity of all laws of nature.

Maharishi Vedic Science

Maharishi Vedic Science is based upon the ancient Vedic tradition of gaining knowledge through exploration of consciousness, developed by the great masters in the Himalayas who first expressed this knowledge and passed it on over many thousands of years in what is now the oldest continuous tradition of knowledge in existence. Maharishi's work in founding Maharishi Vedic Science is very much steeped in that ancient tradition, but his work is also very much imbued with the spirit of modern science and shares its commitment to direct experience and empirical testing as the foundation and criterion of all knowledge. For this reason, and other reasons to be considered below, it is also appropriately called a science. The name "Maharishi Vedic Science" thus indicates both the ancient traditional origins of this body of knowledge and the modern commitment to experience, system, testability, and the demand that knowledge be useful in improving the quality of human life.

The founders of the ancient Vedic tradition discovered the capability of the human mind to settle into a state of deep silence while remaining awake, and therein to experience a completely unified, simple, and unbounded state of awareness, called pure consciousness, which is quite distinct from our ordinary waking, sleeping, or dreaming states of consciousness. In that deep silence, they discovered the capability of the mind to become identified with a boundless, all-pervading, unified field that is experienced as an eternal continuum underlying all existence. They gave expression to the self-sufficient, infinitely dynamic, self-interacting qualities of this unified state of awareness; and they articulated the dynamics by which it sequentially gives rise, through its own self-interacting dynamics, to the field of space-time geometry, and subsequently to all the distinct forms and phenomena that constitute the universe. They perceived the fine fabric of activity, as Maharishi explains it, through which this unity of pure consciousness, in the pro-

cess of knowing itself, gives rise sequentially to the diversity of natural law and ultimately to the whole of nature.

This experience was not, Maharishi asserts, on the level of thinking, or theoretical conjecture, or imagination, but on the level of direct experience, which is more vivid, distinct, clear, and orderly than sensory experience, perhaps much in the same way that Newton or Einstein, when they discovered the laws of universal gravitation or special relativity, enjoyed a vivid experience of sudden understanding or a kind of direct “insight” into these laws. The experience of the unified field of all the laws of nature appears to be a direct experience of this sort, except that it includes all laws of nature at one time as a unified totality at the basis of all existence—an experience obviously far outside the range of average waking state experience.

The ancient Vedic literature, as Maharishi interprets it, expresses, in the sequence of its flow and the structure of its organization, the sequence of the unfoldment of the diversity of all laws of nature out of the unified field of natural law. The Veda is thus to be understood as the sequential flow of this process of the oneness of pure consciousness giving rise to diversity; and Maharishi Vedic Science is to be understood as a body of knowledge based on the direct experience of the sequential unfoldment of the unified field into the diversity of nature. It is an account, according to Maharishi, of the origin of the universe from the unified field of natural law, an account that is open to verification through direct experience, and is thus to be understood as a systematic science.

These ancient seers of the Vedic tradition developed techniques to refine the human physiology so that it can produce this level of experience, techniques that were passed on over many generations, but were eventually lost. Maharishi’s revival and reinterpretation of ancient Vedic science is based on his revival of these techniques which have now been made widely accessible through the training of thousands of teachers of the Transcendental Meditation program. He has thus provided a reliable method of access to this field of direct experience where the oneness of pure consciousness gives rise to the diversity of the laws of nature; and he has also developed applications of this technology that render it open to experimental testing. These applications will be considered below.

Maharishi describes the experience of this unified field of consciousness as an experience of a completely unchanging, unbounded unity of consciousness, silently awake within itself. Gaining intimate familiarity with the silence of pure consciousness, Maharishi holds, one gains the ability to experience within that silence an eternal “fabric” or “blueprint” of all laws of nature that govern the universe, existing at the unmanifest basis of all existence. This unmanifest basis of life, where all laws of nature eternally reside in a collected unity, is experienced as the fabric of the silent field of consciousness itself, which is not in space and time, but lies at the unmanifest basis of all manifest activity in space and time. Through Maharishi’s work, this experience comes to be understood (as we see below) as a normal state of consciousness that arises in the natural course of human development.

Glimpses of this universal domain of experience, where all possibilities reside together in an eternally unified state, have been reported in almost every culture and historical epoch, from Plato to Plotinus and Augustine, and from Leibniz to Hegel and Whitehead. Scientists like Kepler, Descartes, Cantor, and Einstein also appear to have written of it and seemingly drew their insights into the laws of nature from this experience. Descartes (1908) writes, for example, of an experience that he had as a young man of “penetrating to the very heart of the kingdom of knowledge” and there comprehending all the sciences, not in sequence, but “all at once.” Scientists and writers from many traditions have described this experience of unity, which confirms that it is completely universal, and not a product of a particular cultural tradition. Just as the Vedic tradition has been misunderstood, however, so have those descriptions of consciousness found in these different cultural traditions; for without a technique that makes the experience systematically accessible to everyone, the understanding that this is a universal experience of the most fundamental level of nature’s activity has been obscured, and has not before now emerged into the light of universal science.

According to Maharishi Vedic Science, it is not only possible to gain direct experience of the unity of natural law at the basis of the manifest universe, but one can also directly experience the unity of nature sequentially giving rise to the diversity of natural law through its own self-interacting dynamics. Maharishi’s most recent research has

centered on delving deeply into the analysis of these self-interacting dynamics of consciousness.

The Self-Interacting Dynamics of Consciousness

When one gains the capability, through practice of the Transcendental Meditation technique, of remaining awake while becoming perfectly settled and still, one gains the ability to experience a completely simple, unified, undifferentiated, self-referral state of pure consciousness, which is called *Saṁhitā* in the Vedic literature, in which knower, known, and process of knowing are one and the same. Consciousness is simply awake to itself, knowing its own nature as simple, unified pure consciousness. Yet in knowing itself, the state of pure consciousness creates an intellectually conceived distinction between itself as knower, itself as known, and itself as process of knowing. In Vedic literature, this is reflected in the distinction between *Ṛishi* (knower), *Devatā* (process of knowing), and *Chhandas* (object of knowledge). According to Maharishi, from the various interactions and transformations of these three intellectually conceived values in the unified state of pure consciousness, all diverse forms of knowledge, all diverse laws of nature, and ultimately all diversity in material nature itself sequentially emerge.

The conscious mind, awake at this totally settled and still level of awareness, can witness the mechanics by which this diversification of the many out of the unity of pure consciousness takes place. The mechanics of *Ṛishi*, *Devatā*, and *Chhandas* transforming themselves into *Saṁhitā*, *Saṁhitā* transforming itself into *Ṛishi*, *Devatā*, and *Chhandas*, and *Ṛishi*, *Devatā*, and *Chhandas* transforming themselves into each other are the mechanics by which the unity of pure consciousness gives rise to the diversity of natural law. These mechanics are expressed in the sequential unfoldment of Vedic literature. These are the self-interacting dynamics of consciousness knowing itself, which, Maharishi asserts, sequentially give rise to all diversity in nature.

Maharishi (1986) describes this self-referral state of consciousness as the basis of all creative processes in nature:

This self-referral state of consciousness is that one element in nature on the ground of which the infinite variety of creation is continuously emerging, growing, and dissolving. The whole field of change emerges from this field of non-change, from this self-referral, immortal state of

consciousness. The interaction of the different intellectually conceived components of this unified self-referral state of consciousness is that all-powerful activity at the most elementary level of nature. That activity is responsible for the innumerable varieties of life in the world, the innumerable streams of intelligence in creation. (pp. 25–26)

The Structure of *Maharishi Vedic Science*

One of Maharishi's most important contributions to Vedic scholarship has been his discovery of the *Apaurusheya Bhashyā*, the “uncreated commentary” of the Ṛk Veda, which brings to light the dynamics by which the Veda emerges sequentially from the self-interacting dynamics of consciousness. According to Maharishi's analysis, the Veda unfolds through its own commentary on itself, through the sequential unfoldment, in different-sized packets of knowledge, of its own knowledge of itself. All knowledge of the Veda is contained implicitly even in the first syllable “Ak” of the Ṛk Veda, and each subsequent expression of knowledge elaborates the meaning inherent in that packet of knowledge through an expanded commentary. The phonology of that syllable, as analyzed by Maharishi, expresses the self-interacting dynamics of consciousness knowing itself. As pure consciousness interacts with itself, at every stage of creation a new level of wholeness emerges to express the same self-interacting dynamics of Ṛishi, Devatā, and Chhandas.

Thus the body of Vedic literature reflects, in its very organization and structure, the sequential emergence of all structures of natural law from the unity of pure consciousness. Each unit of Vedic literature—Ṛk Veda, Sāma Veda, Yajur-Veda, Atharva Veda, Upanishad, Āraṇyakas, Brahmaṇa, Vedāṅga, Upāṅga, Itihās, Purāṇ, Smṛiti, and Upaveda—expresses one aspect or level of the process. As Maharishi (1986) describes it:

The whole of Vedic literature is beautifully organized in its sequential development to present complete knowledge of the reality at the unmanifest basis of creation and complete knowledge of all of its manifest values. (p. 28)

Veda, Maharishi asserts, is the self-interaction of consciousness that ultimately gives rise to the diversity of nature. The diversity of creation sequentially unfolding from the unity of consciousness is the result of

distinctions being created within the wholeness of consciousness, as consciousness knows itself. Thus from the perspective of Maharishi Vedic Science, the entire universe is just an expression of consciousness moving within itself: All activity in nature is just activity within the unchanging continuum of the wholeness of consciousness.

Through the texts of ancient Vedic science, as interpreted by Maharishi, we possess a rich account of the emergence of diversity out of the unity of natural law. On the basis of this account, it becomes feasible to compare the Vedic description of the origin of the universe with that of the modern sciences.

Modern Science and *Maharishi Vedic Science*

When Maharishi heard from major scientists of the recent advances of unified field theory in physics, he asserted that modern science had glimpsed the unified field described in ancient Vedic science. “The knowledge of the unified field,” he said (1986, p. 29), “has been discovered by modern science during just the last few years, but the complete knowledge of the unified field has always been available in the Vedic literature.” Modern science, he proposed, had now arrived at the edge of comprehending, through unified quantum field theories, what Vedic science had described on the basis of exploration of the least excited state of consciousness since ancient times: that all diversity in nature sequentially emerges from a unified source through a precise self-interacting dynamics. Modern experimental science and Maharishi Vedic Science could now be seen as two diverse yet mutually complementary approaches to knowing the same underlying reality—one through the empirical method, the other through the exploration of the least excited state of consciousness. Through Maharishi’s inspiration, this has become a major research program that has engaged the attention of many scientists and that has yielded very rich results.

Over the past decade, Maharishi has participated in numerous symposia with major scientists on the theme of exploring modern science and Vedic science to discover detailed structural similarities in their descriptions of the unified field. These symposia have attracted eminent unified field theorists, mathematicians, and physiologists, including a number of Nobel laureates, as well as many of the most highly recognized Pandits of the Vedic tradition. Out of these interactions has come

a meeting of two traditions, East and West, on the ground of their common theme: the investigation of the unified field. Those who have followed these symposia have recognized a deep and impressive structure of knowledge common to both traditions. Both identify a boundless, all-pervading field underlying all states of matter and energy in the universe; both locate it on the most fundamental time-distance scale of nature; both assign to it the same properties of self-sufficiency, self-interaction, infinite dynamism, unboundedness, and unity, among many other common attributes; both identify a threefold structure at the basis of all nature; and both describe a dynamics by which the diversity of nature sequentially emerges from this unified field according to precise laws. The result of these symposia has been that many scientists, following Maharishi's lead, now feel confident to assert that the unified field described by physics and the unified field of consciousness described by Vedic science are one and the same.

In the first issue of *Modern Science and Vedic Science*, the lead article by John Hagelin explored many of the deep connections between contemporary unified field theory in physics and Maharishi Vedic Science from the standpoint of an active field theorist. His work brought these two diverse methods of inquiry into close relation, drawing upon both the latest developments of unified field theories and the direct experience of the unified field.

Dr. Hagelin presented evidence for Maharishi's assertion that the unified field of consciousness and the unified field of physics are the same. His main empirical evidence for this new paradigm was drawn from experimental research in the social sciences on the "Maharishi Effect"—the measurable effects on society resulting from the practice of the Transcendental Meditation and TM-Sidhi programs, including Yogic Flying. As further evidence for the identity of consciousness and the unified field, he cited deep parallels between the descriptions of the unified field found in physics and Maharishi Vedic Science. These strikingly similar descriptions support the conclusion that modern science and Maharishi Vedic Science are two complementary methods of approach to the same underlying unity of nature.

The New Paradigm of the Unity of Nature

It is a common belief that the unified field of physics is an objective reality of nature and that consciousness is a subjective experience, and that the two belong, consequently, to different categories of existence. According to this understanding, one is purely material, the other is purely mental, and the two cannot, therefore, be equated.

Through the experience of pure consciousness described in Maharishi Vedic Science, that unified level of intelligence is experienced, not as a mere subjective and localized phenomenon of thought or sensation, but as a non-changing, unbounded field of Being, pervading all forms and phenomena in the universe on a non-active, silent, unmanifest level. Objective and subjective aspects of nature are seen as but two manifest modes of this unified field at the unmanifest basis of existence. A thorough examination of the nature of the unified field in physics and the descriptions of unbounded consciousness brought to light by Maharishi support the thesis that they are but two complementary modes of apprehending a single underlying reality.

The view of nature as consisting of billiard-ball-type objects, each separate, discrete, and isolated from the other, belongs to the old classical Newtonian view of the world. Quantum field theory in modern physics no longer views nature in this way, but provides a new understanding in which the primary reality is that of quantum fields. All forms of matter and energy are understood to be excitations of these underlying fields. In the last year and a half, the apparently different fields of gravity, electromagnetism, and the weak and strong interactions have been theoretically unified as different levels of expression of one single underlying field. All forms and phenomena in the universe are just modes of vibratory excitation of this one all-pervading unified field.

Today, the success of modern physics in unifying our understanding of physical nature is mirrored in the success of Maharishi Vedic Science in unifying our understanding of consciousness. When the unbounded level of pure consciousness is gained as a direct experience, all activity in nature is experienced as an excited state of that one all-pervading field. Since quantum field theory also describes all activity in the universe as excitations of one underlying field, the simplest interpretation is that there is a single unified field which can be known both

through direct experience and through the objective sciences. In this new understanding of the unity of nature, mind and matter cease to be viewed as ultimately different and come to be seen as expressions of a deeper unity of unbounded consciousness.

The unity of nature is not merely a hypothetical unity, nor a unity of intellectual understanding or interpretation. It is a unity of direct experience that has been described in almost every tradition and every historical epoch. Maharishi Vedic Science only brings to light what has been the experience of many of the greatest minds throughout history. What is radically new is that Maharishi has provided a systematic and reliable method by which anyone can gain access to this level of experience. This method of access is the Transcendental Meditation and TM-Sidhi programs, including Yogic Flying.

The Transcendental Meditation and TM-Sidhi Programs, including Yogic Flying

The Transcendental Meditation and TM-Sidhi programs, including Yogic Flying, have been introduced by Maharishi as an effective means for opening the unified field to all as a direct experience. In this way, the unified field becomes universally accessible to systematic exploration.

The key component of these programs is the Transcendental Meditation technique, which provides a systematic procedure by which the mind is allowed to settle naturally into a state of restful alertness, the self-referral state of pure consciousness, in which the mind is completely silent and yet awake. In this way, the state of pure consciousness, which has been the subject of philosophical speculation throughout the centuries, can now be investigated on the basis of direct experience. Maharishi's immensely important contribution to the clarification and elucidation of this experience of pure consciousness will be a theme for analysis in future issues of this journal.

This quiet, still level of consciousness has rarely been experienced in the past because no systematic and effective technique has been available for providing that experience. The Transcendental Meditation technique is a simple, natural, and effortless procedure for allowing the awareness to settle into a state of deep silence while remaining awake. It has proved to be uniquely effective in making this level of experience widely accessible. Through the deep rest gained during the

practice of the technique, balance is systematically created on all levels of physiological functioning, and the nervous system is habituated to a more settled, coherent, and alert style of functioning. In time, a state of completely integrated functioning is gained, in which pure consciousness is spontaneously and permanently maintained. Once this state is established, the silent, self-referral field of awareness is always present as a stable, non-changing ground underlying all changing states of awareness. This integrated state of consciousness, Maharishi holds, is the basis of all excellence in life and provides the foundation for the further development of higher states of consciousness through the practice of the Transcendental Meditation and TM-Sidhi programs, including Yogic Flying.

Maharishi's Programs for the Development of Higher States of Consciousness

The ultimate purpose of all aspects of the Transcendental Meditation and TM-Sidhi programs, including Yogic Flying, and Vedic Science is the development of consciousness, the unfoldment of the full human potential to live life in enlightenment. Enlightenment is that fully developed state of life in which one enjoys complete knowledge and lives in total fulfillment. In this state, one lives in harmony with all the laws of nature, enjoying the full support of natural law to achieve any desire without making mistakes.

Maharishi has identified a specific sequence of higher states of consciousness, each distinct from waking, dreaming, and sleeping, which, he asserts, arise in the normal full course of human development. Each state of consciousness unfolds on the basis of a concrete shift in the mode of the individual's neurophysiological functioning. These states can be distinguished from waking, dreaming, and sleeping on the basis of their distinct physiological correlates. The higher states of consciousness that arise in this developmental sequence are, Maharishi asserts, a source of greater joy, knowledge, and fulfillment than ordinary waking state life.

The attainment of these higher states of consciousness is the basis for fully understanding and applying the theoretical assertions of Maharishi Vedic Science. Maharishi Vedic Science is just the exposition of the full range of direct experience that unfolds during the course of the natural

development of human consciousness. These states of consciousness are universal stages of human development accessible to everyone through the practice of Maharishi's technologies of consciousness. What before was shrouded in the veil of mysticism is now scientifically understood as a normal, natural stage of human life available to anyone.

An article in the first issue of *Modern Science and Vedic Science*, by Dr. Charles Alexander and others (1987) examined the empirical evidence, drawn from behavioral and neurophysiological research, for the existence of these higher stages of human development. This article unfolded the scientific basis for understanding and verifying higher states of consciousness from the standpoint of a developmental psychologist, and laid the basis for a new paradigm of human development.

Research on the Relation between Modern Science and *Maharishi Vedic Science*

Each individual nervous system, when refined through Maharishi's technologies of consciousness, is an instrument through which the silent field of pure unbounded consciousness becomes accessible as a field of inquiry. Since the unified field is all-pervading and everywhere the same, a nervous system finely enough attuned in its functioning can gain the ability, according to Maharishi, to experience and identify itself with that unbounded, undifferentiated, and unified field underlying all activity in nature. By taking one's awareness from the gross level of sensory objects to perception of finer levels of activity, one gains the ability to experience that level of nature's functioning at which the unity of pure consciousness gives rise to diversity. Gaining this unified state of consciousness is the means by which anyone can experience and confirm the structure of knowledge and reality described in Maharishi Vedic Science. This is partly what makes Maharishi Vedic Science a precise, verifiable science: All theoretical structures of the science can be verified through a reliable, systematic, effective technology. Other foundational aspects of this science will be considered below.

Maharishi's technologies of consciousness become, in the modern world, a method for the investigation of the unified field and the most refined level of nature's activity through direct experience. Modern physics, through its objective method of inquiry, has glimpsed a unified field underlying all of nature, but physics has reached a fundamental

impasse in its ability to experimentally investigate the unified field, because the energies required to probe these finer scales exceed those attainable by any conceivable particle accelerator technology. When physics can go no further, Maharishi's technologies of consciousness, facilitate inquiry beyond the limitations of the objective approach by providing an effective means of exploring the unified field on the level of direct experience.

This exploration of the unified field through the subjective experience of consciousness is a well-structured program of research. It is guided by the knowledge of Maharishi Vedic Science set forth by Maharishi in conjunction with the modern sciences. When descriptions of the unified field from the standpoint of modern science, of Maharishi Vedic Science, and of direct experience coalesce, the three together provide a basis for complete knowledge. This program of research is based on Maharishi's exposition of the Vedic literature as a complete and detailed expression of the unified field.

According to Maharishi's exposition of the Veda, the sequential emergence of the diverse laws of nature from the unified field can be directly experienced in the field of consciousness as a sequence of sounds; these are presented in the sequential emergence of phonological structures of the Vedic texts. Veda is just the structure of the self-interacting dynamics through which the unified field gives rise to the diverse expressions of natural law. Fundamental theoretical concepts in physics and other disciplines, insofar as they are valid descriptions of nature, should therefore correspond to different aspects of Vedic literature that describe these realities from the standpoint of direct experience.

The basic program of research of modern science and Maharishi Vedic Science, as conceived by Maharishi, thus has three major goals: (1) to develop an integrated structure of knowledge by fathoming the depth of correspondence between the principles of modern science and Vedic Science; (2) to provide, from Maharishi Vedic Science, a foundation in direct experience for the most profound theoretical concepts of modern science; and (3) to resolve the impasse faced by the objective approach of modern science through the addition of the subjective approach of Maharishi Vedic Science, which provides complete knowledge of nature on the basis of the complete development of the knower.

In another issue of *Modern Science and Vedic Science* [see Vol. 5, Pt. 1 of this series], Dr. M.H. Weinless (1987) explored set theory and other foundational areas of modern mathematics in relation to Maharishi Vedic Science. In a proposed issue, Drs. R.K. Wallace, D.S. Pasco, and J.B. Fagan (1988) explore the fundamental relationship between Maharishi Vedic Science and the foundational areas of modern physiology, such as molecular biology. Their paper also discusses the extent to which fundamental principles of Maharishi Vedic Science can be used to further investigation of DNA structure and function.

The discovery of deep structures of knowledge and principles common to Maharishi Vedic Science and modern science represents such a profound contribution to our understanding of nature that this journal was founded to foster continued scholarly investigation of the interrelations between these complementary methods of gaining knowledge. Knowledge gained by direct experience of the fine fabrics of nature's activity, and knowledge gained by the experimental methods of modern science coalesce in a new integrated method of inquiry that offers both the fundamental principles of modern science and the expressions of direct experience in Maharishi Vedic Science as two facets of one reality of nature's functioning.

Maharishi (1986) sums up the relation between Maharishi Vedic Science, modern science, and his technologies of consciousness:

Maharishi Vedic Science is applied through the Technology of the Unified Field. We speak of the unified field in connection with Maharishi Vedic Science because of the similarity of what has been discovered by physics and what exists in the self-referral state of human consciousness. The Technology of the Unified Field [That is, Transcendental Meditation and TM-Sidhi programs, including Yogic Flying—Eds.], is a purely scientific procedure for the total development of the human psyche, the total development of the race. This is a time when objective, science-based progress in the world is being enriched by the possibility of total development of human life on earth, and this is the reason why we anticipate the creation of a unified field-based civilization. (p. 35)

On the basis of the universal availability of this domain of experience, an empirical science of consciousness becomes possible for the first time.

The Science of Creative Intelligence: Foundations of a New Science of Consciousness

The unified science that links the objective method of modern science and the subjective method of Maharishi Vedic Science, while preserving the integrity of each, is called the Science of Creative Intelligence (SCI). Maharishi himself has laid the foundations of this new science by showing, first, how a precise subjective science of consciousness is established on the basis of the direct experience of consciousness in its pure form; and second, how the experimental method can be used to test empirically the assertions of the subjective science. Through Maharishi's work, for the first time in history, the full potential of human consciousness can be investigated both through direct experience and through the objective methods of modern science. The foundations of this new science linking the subjective and objective method will now be considered.

Experiential Foundations

Prior to Maharishi's work, the term *consciousness* was considered too vague and indefinite to be allowed into scientific discussion. It was excluded from science as a metaphysical term because consciousness was not objectively observable, and therefore apparently not amenable to scientific investigation. Through Maharishi's work, the concept of consciousness has been given a precise, well-defined meaning on the basis of direct experience, and its relation to the objective framework of science has been precisely specified.

The experience of pure consciousness, available to anyone through regular practice of the Transcendental Meditation technique, is a basis for precise experiential knowledge of consciousness in its simplest, most fundamental, and most unified state. Even though consciousness can never be an object of experience, when the conscious mind becomes completely settled in a wakeful state, it experiences its own nature as pure wakefulness, pure consciousness, without any activity or objective content. Through the repeatable, systematic experience of this silent but wakeful state of mind, the concept of pure consciousness, which has been subject to conjecture and debate throughout the centuries, is now available to direct experience.

Having laid the basis for introducing consciousness into science as a precise concept, it remained for Maharishi to develop a program of applied research to test theoretical predictions of Maharishi Vedic Science. Identifying consciousness with the unified field provides a precise understanding of where consciousness is located in the framework of the sciences. To create an empirical science of consciousness, however, it was also necessary to account for how consciousness could be investigated through experimental research.

Empirical Foundations

Maharishi's work has laid the foundation for an experimental investigation of consciousness. He has led the way in drawing out predictions of Vedic science that are open to testing, translating discussions of consciousness, derived from experience of higher states of consciousness, into predictions of experimentally observable phenomena. Three examples will illustrate this principle.

Pure consciousness, as was noted above, is experienced during the practice of the Transcendental Meditation technique as a state of pure restful alertness. This purely subjective experience does not, however, establish objectively whether it is in fact a state of deep rest and alertness, or only seems to be. If a person is in a deep state of rest and alertness, Maharishi has asserted, then physiological evidence of deep rest and alertness should be observable. Reduced levels of oxygen consumption, reduced breath rate, and other measures of more refined physiological activity would be predicted. Patterns of EEG coherence in the alpha range, indicative of restful alertness, should also be observed. Early pioneering research by Dr. R.K. Wallace (1986) found that these changes do indeed occur. In this way, statements about the subjective experience of consciousness were translated into empirically verifiable assertions. The basis of this correlation between consciousness and physiology is a principle, fundamental to Maharishi's thinking, that for every state of consciousness there is a corresponding state of physiological functioning. The range of physiological correlates of the experience of pure consciousness is a subject of continuing research.

Consider a second example. Pure consciousness is understood in Maharishi Vedic Science as a clear and settled state of awareness. Anyone who gains this state is said to have a mind like a placid lake, unrippled

by waves, and thus able to reflect the world in a precise, non-agitated manner. Maharishi drew from this several predictions. One is that a person growing in the ability to experience pure consciousness would experience more stable and orderly physiological functioning. This can be translated into the testable prediction that subjects regularly practicing the Transcendental Meditation program display increased stability of the autonomic nervous system. Another prediction is that the practice of the Transcendental Meditation program will produce greater perceptual clarity and greater orderliness of thinking. Translated into specific terms, this leads to the prediction that practicing the Transcendental Meditation program will produce measurable increases on such scales as auditory discrimination, brain wave coherence, and problem solving ability. Research has been designed, carried out, and reported in the literature which measures the growth of these parameters in groups practicing the Transcendental Meditation program by comparison to control groups, thus providing objective verification of the predicted correlates of the subjective experience of pure consciousness.

A third example of how assertions of Maharishi Vedic Science can be translated into testable form is found in the sociological experiments on the Transcendental Meditation and TM-Sidhi programs, including Yogic Flying. The hypothesis is that a group of people practicing this technology in one place, by bringing their awareness to the level of perfect orderliness in the unified field, will enliven qualities of harmony and orderliness in collective consciousness, thus producing measurable positive changes in the quality of societal life. Many experiments have been designed by Maharishi and carried out, demonstrating the power of this technology to produce significant changes in the level of coherence, positivity, balance, and stability in society, even on a global scale. (See *Experimental Research*, below.) The results of these experiments strongly support Maharishi's assertion that consciousness is identical with the unified field.

Experimental Research

Over 600 hundred experimental studies in the areas of physiology, psychology, and sociology provide substantial confirmation of many basic assertions of Maharishi Vedic Science in the arena of empirical science. Many of these studies, now published in major scientific jour-

nals throughout the world, have been collected in the volumes called *Scientific Research on the Transcendental Meditation Programme: Collected Papers, Vols. 1–6* (1977–1991). This research provides experimental validation of the efficacy of the Transcendental Meditation and TM-Sidhi programs, including Yogic Flying. Because this research— from over 600 scientific studies at over 300 universities and research institutions in 33 countries, published in more than 100 scientific journals—is too extensive to summarize here, the reader is referred to the *Collected Papers* for articles cited in this and other professional journals. Overall, this research probably represents the most concerted, well-designed research program on a potential means to benefit mankind ever conceived. Its present standing is that, taken together as a body of research, it is one of the most impressive confirmations of a theory of human potential ever executed.

Although it is beyond the scope of this introduction to go into the details of this research, it is worthwhile to mention some of the broad categories of scientific investigation that have evolved to guide the research program of the Science of Creative Intelligence. The main areas of research include studies on the individual and society. Research on benefits to the individual may be further subdivided into studies of physiological changes (both during and after the practice); cognitive, psychological, and behavioral changes; benefits to health and social behavior; and benefits to athletic performance, performance in business, and academic performance. Research on social benefits through collective practice may be further grouped into research on families, city populations, national populations, and global population. These research studies fall into the categories of crime prevention, accident prevention, benefits to economy, health, violence reduction, and world peace.

On the basis of this research, basic assertions of Maharishi Vedic Science become verifiable through empirical science. There is, moreover, a unity of theory underlying these diverse predictions and tests. These studies, taken as a whole, constitute a coherent research program that tests the prediction that repeated experience of the unified field results in greater orderliness, coherence, and positivity, in both individual and social life. Research on these changes not only tests fundamental theory, but demonstrates the practical benefits of this new

technology. Maharishi's technologies of consciousness become open to experimental testing precisely because they have significant practical applications in improving every area of human life.

Practical Applications of the *Transcendental Meditation* and *TM-Sidhi* Programs, including *Yogic Flying*

Maharishi has frequently asserted that the purpose of Maharishi Vedic Science is to benefit life, not merely to give knowledge for its own sake. Knowledge, he holds, is for action, action for achievement, and achievement for fulfillment. The ultimate purpose of Maharishi Vedic Science and its applied technology is, therefore, to bring human life to fulfillment.

Maharishi's technologies of consciousness bring fulfillment to individual life by unfolding the full potential of consciousness. When higher states of consciousness are realized, Maharishi emphasized, life is lived in "twenty-four-hour bliss." Gaining contact with the unified field, one enjoys spontaneous right action, lives life in total accord with all the laws of nature, and accomplishes any life-supporting desire. Violations of natural law cease, and all suffering, which is caused by violation of natural law, comes to an end. Life is lived free from mistakes, in inner and outer fulfillment. Such is the fundamental purpose of the technologies Maharishi has created.

Perfect Health

Maharishi's technologies of consciousness have important practical applications in the area of health. According to Maharishi, sickness arises from imbalance. Perfect health means wholeness, balance on all levels of life. When individual life is established in the unified field of all the laws of nature, all actions are spontaneously in accord with natural law. In terms of physiological functioning, this means perfect integration and balance, from the biochemical and molecular levels to the macroscopic, organismic levels.

Maharishi Ayurveda is an integral part of Maharishi Vedic Science. It is a revitalized form of the ancient ayurvedic science of life and health, restored to its original purity and effectiveness by Maharishi.

According to Maharishi, the cornerstone of Ayurveda is the development of consciousness. Perfect health in mind, body, and behavior is the result of perfect balance in consciousness and physiology. This develops through the Transcendental Meditation and TM-Sidhi programs, including Yogic Flying, when the mind identifies itself with the unified field, the field of perfect balance and wholeness.

Maharishi Ayurveda combines Maharishi's technologies of consciousness with specific procedures to treat and prevent illness and promote longevity. Maharishi Ayurveda Medical Centers have been established in many countries to eliminate the basis of sickness, create perfect health, and reverse the aging process. Over the last fifteen years, research into the effects of Maharishi's technologies of consciousness, on health have been carried out at research institutions all over the world, and Maharishi's recent emphasis on Ayurveda provides many new research opportunities for investigating the applications of Vedic Science in the area of health.

Maharishi's technologies of consciousness also include technologies to accomplish specific goals of individual and social life. The TM-Sidhi program has been founded by Maharishi to utilize the knowledge and the organizing power of the unified field for improving achievements in every area of human endeavor.

Unfolding Full Human Potential through the *Transcendental Meditation* and *TM-Sidhi* programs

When one gains the level of experience of the self-interacting dynamics of consciousness, Maharishi holds, one gains command over all the laws of nature. Stationed at the source of all the laws of nature, at the "central switchboard" of nature's activity, human consciousness can command all the laws of nature to create any desirable effect in the material world. Maharishi has brought forth a program for gaining mastery over all the laws of nature, based on the formulations found in the ancient *Yoga Sūtras* of Patanjali, one of the principal books of Vedic literature. This is the TM-Sidhi program, in which the mind gains the ability to function from the level of the self-interacting dynamics of the unified field. Once established in pure self-referral awareness through the practice of the Transcendental Meditation program, an individual

gains the ability to draw upon the organizing power of the unified field to accomplish anything. Since the unified field is the source of all existence, its organizing power is infinite, and one who functions from this level has unlimited organizing ability. Established in that unified field of all possibilities on the unmanifest level of existence before consciousness assumes the form of matter, all possibilities open to one's awareness and one can govern the expressions of the unified field as it transforms itself into matter. As Maharishi (1986) expresses it:

In this program, human awareness identifies itself with that most powerful level of nature's functioning and starts to function from there. The purpose of the TM-Sidhi program is to consciously create activity from that level from where nature performs. (p. 74)

Through the practice of the TM-Sidhi program, Maharishi predicts, it will become possible to achieve levels of body-mind coordination hitherto deemed impossible. It will be possible, he asserts, to realize the ancient dream of flying through the air, and to develop highly enhanced powers of hearing, seeing, and intuition that extend the senses far beyond the limits currently conceived to be possible. In the Yogic Flying technique, which Maharishi developed from the Yoga Sūtras, the silent state of self-referral consciousness is integrated most fully with outer activity as the body lifts in spontaneous hops, generating inner bliss and maximum coherence in brain functioning. Other Vedic texts describe the ability to move through the air at will as a result of perfection of this Yogic Flying technique. By activating laws of nature that are now hidden to ordinary methods of scientific investigation, the TM-Sidhi program provides a research methodology to explore what is possible for mankind to achieve on the basis of functioning from that level where the conscious mind has become identified with the unified field. This is the basis of a technological revolution more powerful and beneficial to life than any conceived through empirical science.

The Maharishi Effect

The TM-Sidhi program, when practiced in groups, is even more powerful than the TM-Sidhi program practiced alone. The collective practice of the TM-Sidhi program can produce an influence that affects the entire world in measurable ways. This global influence of coherence

generated through the group practice of the Transcendental Meditation and TM-Sidhi programs, including Yogic Flying, has been called the “Maharishi Effect.”

As early as 1960, Maharishi predicted that when individuals practice the Transcendental Meditation and TM-Sidhi programs in sufficiently large groups, a measurable increase in orderliness, coherence, and positive trends would be observed in society. By enlivening the life-supporting and evolutionary qualities of the unified field, such as perfect orderliness, infinite dynamism, and self-sufficiency, Maharishi held, these qualities would be enlivened in collective consciousness and this would have positive, measurable effects on a wide social scale.

Over the years, social scientists developed formulas for predicting the size of the group necessary to create a “phase transition” in society to a measurably higher quality of life. These formulas, calculated on the basis of analogous phase transitions, from disorder to orderliness, studied in physics, came out to be approximately one percent of a population practicing the Transcendental Meditation program, and a much smaller percentage, on the order of the square root of one percent, practicing the TM-Sidhi program.

Since 1978, many experimental studies have been performed to measure the effect of large groups practicing the TM-Sidhi program. Experimental confirmation of the principle has been the consistent result. The Maharishi Effect is now as well documented as any principle of modern social science. In creating this technology, Maharishi has provided an effective method of social change that operates from the silent, harmonizing level of the unified field to produce a transformation in the quality of collective consciousness, thereby effortlessly creating coherence on a global scale. Maharishi (1986) describes how this effect is produced:

The transcendental level of nature’s functioning is the level of infinite correlation. When the group awareness is brought in attunement with that level, then a very intensified influence of coherence radiates, and a great richness is created. Infinite correlation is a quality of the transcendental level of nature’s functioning from where orderliness governs the universe. (p. 75)

D. W. Orme-Johnson and M .C. Dillbeck (1987) have summarized the empirical research on the Maharishi Effect. They surveyed

experimental studies documenting the sociological improvements resulting from the group practice of the TM-Sidhi program. Based on these results Maharishi asserts that the collective practice of the TM-Sidhi program in groups of 8000 (the square root of one percent of the world's population) would produce coherence in the collective consciousness of the entire world. Statistically significant reductions in crime, accidents, fatalities, and disease, and other positive benefits on a global scale observed during experimental periods have established this as an effective means of changing collective consciousness and thereby changing the quality of life in the world—simply by enlivening the source of order and coherence at the basis of nature, from the level of the unified field.

Maharishi's Program to Create World Peace

The most dramatic application of the Transcendental Meditation and TM-Sidhi programs, including Yogic Flying, is Maharishi's program to create world peace through the creation of a permanent group of 8000 collectively practicing Maharishi's technologies of consciousness. These technologies are a basis for eliminating negativity and destructive tendencies throughout the world. Large groups of experts in the TM-Sidhi program, creating coherence, during experimental periods, have provided ample opportunity for scientific research. During these experimental periods, conflict and violence have been reduced in war-torn areas and negative trends have been reversed. Over thirty studies have established the efficacy of this technology to eliminate conflict and promote life-supporting, positive trends throughout the world.

Maharishi clearly lays out the basis of his program to create world peace. Stress, he holds, is the basic cause of all negativity, violence, terrorism, and national and international conflicts. Stress generated by the violation of natural law causes strained trends and tendencies in the environment. Through the Transcendental Meditation and TM-Sidhi programs, including Yogic Flying, human intelligence can be identified with the unified field, and violations of natural law will cease. "Reinforcement of evolutionary power in world consciousness is the only effective way," Maharishi holds, "to neutralize all kinds of negative

trends in the world and maintain world consciousness on a high level of purity" (*Maharishi's Program to Create World Peace*, 1986, p. 7).

The global applications of this new science and technology are almost beyond present levels of imagination. Yet scientific research has found measurable reductions in levels of violence, crime, and other indications of negativity during the practice of the TM-Sidhi program in sufficiently large groups during experimental trial periods. Here for the first time in history is a scientific basis for creating world peace, ending terrorism, and reducing the negative trends of society.

On the basis of these studies, Maharishi holds that world peace can be guaranteed now, within a few years, through the establishment of groups of 8000; he holds that perfect health and unlimited longevity can be achieved for individual life, and that balance, coherence and health in society can be established in our generation. War, crime, poverty, and all problems that bring unhappiness to the family of man can be entirely eliminated. Life, he holds, can be lived in absolute abundance and fulfillment. Maharishi has called upon every significant individual in the world to act now to adopt this program for world peace by creating groups of 8000 collectively practicing the Transcendental Meditation and TM-Sidhi programs, including Yogic Flying, to establish world peace and guarantee its perpetuation.

The practical benefits that Maharishi foresees through these new technologies are far greater than those achieved by the technology based on present science. As science has investigated deeper levels of nature, from microbes to molecules to atoms, new technologies have emerged which apply the knowledge in areas such as medicine and nuclear power. In drawing upon the deepest and most powerful level of natural law, the level of the unified field, Maharishi Vedic Science lays the basis for much more powerful technologies still. Where modern medicine has been able to eliminate some diseases by drawing upon microscopic levels, Maharishi Vedic Science lays the basis for the elimination of all disease, and more importantly, for the creation of perfect health and reversal of aging. While modern science has produced nuclear technology but no technology for peaceful resolution of conflict, Maharishi Vedic Science draws upon the infinite organizing power of the unified field at the basis of nature to create social harmony

and world peace while preserving cultural integrity and stimulating prosperity and progress.

Maharishi's Technologies of Consciousness as a New Method of Gaining Knowledge

The bold assertions about what is practically possible through the application of Maharishi's technologies of consciousness must be understood in the context of the new method of gaining knowledge that Maharishi has founded. The history of science testifies that as new methods of gaining knowledge of deeper and more unified levels of natural law become available, more powerful and useful technologies become available. Maharishi's technologies of consciousness are based on the deepest and most unified level of knowledge of nature. It should not be surprising, therefore, that this technology provides a radically new source of organizing power to fulfill the highest goals of mankind.

These technologies of consciousness offer a fundamentally new approach to knowledge that has not been available before. In asserting that it is possible for one individual to know all the laws of nature and the entirety of the universe within his or her own consciousness, Maharishi is well aware that he is introducing an account of human potential that goes well beyond the concept of the limits of knowledge that has dominated in the scientific era. This new paradigm of knowledge must be examined in a new light.

It is a widespread belief in the modern age that the only valid method of gaining knowledge is by moving outward through the senses, that is, through the methods of the empirical sciences. It is, however, only the historical failure of subjective approaches that has led to this belief. It cannot be thought that the senses are the only way of gaining knowledge, and those who cling to the belief that it is, only allow old habits to stand in the way of exploring new possible sources of knowledge.

Subjective approaches to knowledge in the past failed to bear fruit because they failed to provide an effective and reliable method of access to an invariant and universal domain of direct experience. They thus failed to establish independent standards of knowledge, they failed to produce methods of distinguishing truth from error, they failed to produce consensus even among those practicing the same method, and

they failed to produce practical technological benefits through the practice of the method.

Maharishi's technologies of consciousness are different from subjective approaches in the past, and must therefore be considered on separate grounds. They provide an effective, reliable method of opening the mind to an invariant and universal level of nature which is everywhere, and yet not ordinarily open to experience because the mind usually functions on more active levels. By providing a technology to make this non-active level of nature available as a direct experience, Maharishi has made this domain available to all as a new field of inquiry; and, where there is a new source of experience of something universal, unchanging, and objectively verifiable, a new source of knowledge is available.

The Science of Creative Intelligence gives a new account of how complete knowledge is possible. When the mind becomes completely settled and still, according to this account, it gains the ability to perceive on the most refined levels of nature's functioning—the all-pervading unified field where all laws reside in a collective totality. It not only experiences this unified field, it becomes identified with it; it *is* the unified field and thus knows the unified field as its own universal Self. On this level of knowledge, there is no separation of knower from the known. Nothing lies outside the range of the knower. All laws of nature and everything in the universe can be known as intimately as one's own Self. Mind and body cease to be seen as separate realities. Maharishi (1986) says:

In reality our self-referral state of consciousness is the unified field—not an object of knowledge as a rose is when we say, “I see that rose.” The unified field is not an object in this way; it is the subject itself. The unified field is a self-referral state of awareness that knows itself, and in knowing itself is the knower and the known, both together. (p. 96)

On this account, there is no distinction between the knower and the reality that it knows. Since it is the Self that knows itself, there is nothing ultimately outside the consciousness of the knower, and there are therefore no limits on what can be known. [This unbounded value of the Self is written with an uppercase “S” to distinguish it from the ordinary, localized self we typically experience.] If true, this account of knowledge provides a fundamentally new source of discovery of the

laws of nature, like the empirical sciences, in that it relies on experience as a source of knowledge, but distinct from these sciences in that it draws upon a wider range of experience. As a new source of discovery, it extends the power of scientific investigation; yet it remains within the scope of empirical science by being subject to procedures of objective verification.

Maharishi University of Management

Maharishi University of Management, formerly Maharishi International University, was founded by Maharishi in 1971, based on the principles of the Science of Creative Intelligence. One of the major functions of this University is to show how each discipline and each level of natural law arises from the unified field of pure consciousness. The specialty of Maharishi University of Management is the knowledge of the unified field of pure consciousness from the standpoint of each academic discipline. At Maharishi University of Management, each modern discipline traces the diversity of laws back to a unified source in the unified field of pure consciousness and shows how the diversity of laws emerge from this unified field through the self-interacting dynamics of consciousness. Just as physics and mathematics have discovered increasingly unified levels of natural law at the basis of their discipline, thus tracing the diversity of its laws to their source in the unified field, so every academic discipline can ultimately show how its laws derive sequentially from the unified field. This project of unification of knowledge, a long sought goal throughout Western intellectual history, is now being systematically pursued and completed at Maharishi University of Management.

This enterprise includes developing charts to show how each modern discipline arises from the unified field of pure consciousness. For each discipline, a Unified Field Chart has been constructed to show how the discipline sequentially emerges from the unified field through the self-interacting dynamics of knower, known, and process of knowing. These Unified Field Charts constitute a major unification of knowledge, showing at a glance how all the diversity of knowledge emerges from a unified source.

Since the unified field is understood as a field of consciousness, and consciousness is the most fundamental level of each student's own Self,

the study of the unified field at Maharishi University of Management constitutes a method of systematically relating all knowledge to the student's Self. The success of Maharishi University of Management's Consciousness-Based education is due in part to this program of relating all knowledge to the unified field and the unified field to the Self. Because all students and faculty at Maharishi University of Management collectively practice the Transcendental Meditation technique, regularly gaining the direct experience of the unified field of pure consciousness, this unified field increasingly becomes a living reality. This unified field ceases to be an abstract concept and becomes as intimate as the Self. The experience of faculty and students has been that learning and inquiry is joyful and most fulfilling in this environment of Consciousness-Based education.

[The reader is referred to other issues of the journal *Modern Science and Vedic Science* as well as to other volumes in this book series *Consciousness-Based Education: A Foundation for Teaching and Learning in the Academic Disciplines* for articles illustrating how Maharishi Vedic Science is transforming our understanding of modern academic disciplines. —Eds.]

Maharishi's Work in Historical Perspective: An Appreciation

Maharishi has created a major watershed in world intellectual history. He has laid the foundation for a fundamental change both in intellectual history and in the history of technology and civilization itself. His work has created a new paradigm of the unity of human knowledge, and, we may expect, will unify the sciences and humanities in a more integrated way than ever before. He has, moreover, brought to an end the old notion that man is born to suffer and that life is a struggle. The practical programs he has founded provide a scientifically validated basis for reducing and even eliminating crime, war, terrorism, poverty, and other problems that beset mankind; more importantly, his discoveries make it possible to live life in the fulfillment of pure knowledge and permanent bliss consciousness and to achieve the highest goals of human endeavor. He has laid the basis for a new civilization, founded on new principles of complete, reliable, useful, fulfilling knowledge—

the knowledge of the unified field of pure consciousness as the perfectly orderly, unified source of nature.

Maharishi is unique in the world today. He has not offered conjectures and hypotheses about reality and human potential, nor does he set himself up as a final authority on matters of knowledge when he speaks rather of experience as the ultimate basis of knowledge. The experience of which he has spoken is derived from a new source, from the level of fully developed human life gained when one's awareness is open to the unified field of pure consciousness. Maharishi's life is an example of that which he taught. Unlike those whose teaching is based solely on the personal authority of the individual, Maharishi has founded universities, sciences, technologies, and other institutions based on universal principles through which any individual can gain the direct experience of the fully unfolded nature of life and validate the truth of what is described in the science. Because of this, Maharishi is held in highest esteem by millions of people around the world.

Maharishi has provided the means of unfolding the dormant creative genius within everyone, and he has established institutions through which the knowledge of how to unfold this potential will be perpetuated generation after generation. He has, moreover, used this knowledge to found programs to create perfect health, progress, prosperity, and permanent peace for the world—programs to end suffering and allow life to be lived in spontaneous accord with natural law. These institutions are not just ideals, but functioning institutions whose practical achievements are now well documented and available for all to examine.

Everyone now has the ability, with the availability of the Transcendental Meditation and TM-Sidhi programs, including Yogic Flying, to engage in this great experiment of identifying one's awareness with the total potential of natural law and to spontaneously live in accord with all the laws of nature while established in the awareness of the unified field of pure consciousness. The experience of approximately three million people who have learned the Transcendental Meditation technique testifies to its practicality and its effortlessness and ease of practice. Experimental studies have shown that its benefits are real and concrete. On this basis, Maharishi has foreseen the creation of a new era of civilization—Heaven on Earth—in which life will be lived

in fullness and abundance without suffering. Maharishi's work eliminates the very basis of stress and suffering and lays the ground for a new civilization, a unified field-based, ideal civilization that draws on the infinite organizing power of the unified field of pure consciousness to bring human life to fulfillment.

References

- Alexander, C. N., Boyer, R. W., & Alexander, V. K. (1986). Higher states of consciousness in the Vedic Psychology of Maharishi Mahesh Yogi: A theoretical introduction and research review. *Modern Science and Vedic Science*, 1, 88–126.
- Chalmers, R. A., Clements, G., Schenkluhn, H., & Weinless, M. (Eds.). (1989). *Scientific research on Maharishi's Transcendental Meditation and TM-Sidhi program: Collected papers (Vols. 2–4)*. Vludrop, the Netherlands: MVU Press.
- Descartes, R. (1908). *Oeuvres* (Vol. X, p. 255, C. Adam & P. Tannery, Eds.). Paris: Cerf.
- Maharishi Mahesh Yogi (1986). *Life supported by natural law*. Washington, DC: Age of Enlightenment Press.
- Maharishi Technology of the Unified Field: Results of scientific research on the Transcendental Meditation and TM-Sidhi programme*. (1984). Fairfield, IA: Maharishi International University Press.
- Maharishi's program to create world peace: Removing the basis of terrorism and war*. (1986). Washington, DC: Age of Enlightenment Press.
- Orme-Johnson, D. W., & Dillbeck, M. (1987). Maharishi's program to create world peace: Theory and research. *Modern Science and Vedic Science*, 1, 207–259.
- Orme-Johnson, D. W., & Farrow, J. T. (Eds.). (1977). *Scientific research on the Transcendental Meditation programme: Collected papers (Vol. 1)*. Rheinweiler, W. Germany: Maharishi European Research University Press.
- Wallace, R. K. (1986). *The Maharishi Technology of the Unified Field: The neurophysiology of enlightenment*. Fairfield, IA: Maharishi International University Neuroscience Press.
- Wallace, R. K., Fagan, J. B., & Pascoe, D. S. (1988). Vedic physiology. *Modern Science and Vedic Science*, 2, 3–59.
- Wallace, R. K., Orme-Johnson, D. W., & Dillbeck, M. C. (Eds.).

(1990). *Scientific Research on Maharishi's Transcendental Meditation program: Collected papers (Vol. 5)*. Fairfield, IA: Maharishi International University Press.

Weinless, M. (1987). The Samhita of sets: Maharishi's Vedic Science and the foundations of mathematics. *Modern Science and Vedic Science*, 1, 141–204. (Reprinted in this Volume, Part 1).

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**Can Science Include Both Objective and Subjective
Approaches to Gaining Knowledge?**

■

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ABSTRACT

This was the methodology chapter of a doctoral dissertation that describes research into reading the traditional Vedic literature in Sanskrit. It begins by considering the nature of scientific inquiry in order to understand the scientific background of the methodology. Western scientific method, known here as the “standard model,” is considered the objective approach. Limitations, applications and successes of this method are described, including the general finding that knowledge has organizing power. Eastern scientific method, or the Vedic model, is considered the subjective approach, based upon pure subjectivity—the Self or consciousness. The scientific character of research in consciousness is described first with reference to the Transcendental Meditation and TM-Sidhi program and then with reference to the research program of reading the Vedic literature after meditation. Both aspects of this approach are found to be scientific—i.e., systematic, reliable, and comprehensive—in providing expanding knowledge as one rises to higher states of consciousness, because “knowledge is structured in consciousness.” This approach draws upon and is verified by direct experience, empirical research, and scientific theory, including textual authentication. The value of understanding and theory in science is discussed in this framework, as is the importance of refining the instrumentation. In summary, Maharishi Vedic Science integrates pure and applied science, and the subjective and objective approaches, in order to raise any individual to the highest states of consciousness, from where he can spontaneously command the organizing power of total natural law.

Western scientific method: the standard model

During the past 400 years, our Western intellectual tradition has built up an “objective” approach to gaining knowledge known as scientific method. This approach emerged in response to a declining effectiveness of subjective means of gaining knowledge and the uncertainty of “knowledge” based on appeal to mere authority during the Middle Ages, which created a growing impetus for reliable, personally verifiable, comprehensive knowledge of natural law.¹ Scientific inquiry therefore arises from a perennial human yearning for truth.²

¹The rise and decline of knowledge of natural law is discussed by Maharishi in *Vedic Knowledge for Everyone*, 219–223.

²W. V. Quine and J. S. Ullian, *The Web of Belief*, 2nd ed. (New York: Random House, Inc., 1978), 4.

Objective approach of modern science

Modern science, and indeed modern civilization, is a paradigm based upon the waking state experience of consciousness. In the waking state, experience varies from one person to another depending upon many factors—such as mental clarity, perceptual acuity, prior experience and knowledge, the individual's cultural milieu—as well as the objects of experience. Even within one individual there are fluctuations of ordinary waking consciousness: variations in alertness, clarity, and the inherent limitations of sensory perception. Hence for knowledge to be considered reliable, certain procedures have been agreed upon as constituting acceptable scientific method. In addition, humankind has developed instruments that extend the range, accuracy and abilities of the senses, such as X-rays, electron microscopes, cyclotrons and computers.

Modern science has progressively explored deeper, more fundamental levels of natural law. The objective approach delivers accurate knowledge in a particular area, controlling against any error due to “subjective” tendencies in the scientist by logic and empirical generalization, use of mathematics or statistics to express the precision of findings, and careful research design to maximize validity.³ This approach has tried to eliminate variable subjectivity from the methods of inquiry, in order to arrive at nonvariant and hence reliable knowledge. Objective knowledge means knowledge that is verified by hypothesis testing via sensory observation. In seeking to understand the known, it excludes as much as possible variable subjective aspects of the knower and the process of knowing.

In the modern scientific approach to knowledge, the world is conceived and described in terms of physical laws whose language, mathematics, is man-made. Knowledge is based on meaning, which language expresses. In contrast, in Maharishi Vedic Science laws of nature are expressed in the Vedic language, the Language of nature itself.⁴ Maharishi describes the Veda and Vedic literature as the structure of natural law responsible for the creation and evolution of the universe.

³For in-depth discussions on modern scientific method, see Karl R. Popper, *The Logic of Scientific Discovery*, rev. ed. (London: Hutchinson & Co., 1972), esp. chapter X; Imre Lakatos, *Philosophical Papers, vol. 1: The Methodology of Scientific Research Programmes*, ed. John Worrall and Gregory Currie, 1st paperback ed. (Cambridge: Cambridge University Press, 1980).

⁴Maharishi Vedic University, *Thirty Years Around the World*, 495-496.

Mathematics is a symbolic language that describes conceptual relationships. It is capable of expressing very deep aspects of natural law, but it lacks the structure, sound value and completeness of the Language of nature.

Modern science has evolved a combination of reason (logic) and empiricism (experience and experiment) in an approach that has become the standard model of science in this century. This standard derives from the logical positivists' hypothetico-deductive model and is founded on deductive inference, or logic.⁵ The logical positivist approach to knowledge relies on observation and experiment to confirm or verify theories, and rejects metaphysical arguments as inconclusive. It ostensibly excludes the subjective elements of the scientist such as moods and feelings, intuition, personal orientation and philosophy, and background.

Limitations of modern science methodology

Science does not expect to gain a total picture of reality; there will always be more details and refinements for a more comprehensive description of the phenomena. Theoretically this is evident in the stance of refutability in science; any case that contradicts a hypothesis renders it false, while at the same time, support for a hypothesis can accrue indefinitely and still the hypothesis is not accepted as "true." It is merely probable, and may even become a law, but there is no limit (in principle) to scientific verification and to new avenues of investigation. Humankind's "yearning for truth," then, runs into an infinite regress—due to the virtually limitless diversity of objective reality and the nature of induction, as Hume pointed out long ago.⁶

As Wells sums up, in this context, "it is universally agreed that the final truth is in principle unobtainable."⁷ Popper admits:

Although I do not think that we can ever describe, by our universal laws, an ultimate essence of the world, I do not doubt that we may seek to probe deeper and deeper into other structures of our world or, as we

⁵ See Popper, *Logic of Scientific Discovery*.

⁶ Hume, *Enquiry Concerning Human Understanding*.

⁷ Geoffrey Wells, *The Logical Foundations of Maharishi's Science of Creative Intelligence*, Part 1: Higher States of Consciousness, unpublished manuscript.

might say, into properties of the world that are more and more essential, or of greater depth.⁸

The empirical method of modern science proceeds by isolating phenomena as much as possible and then investigating them within their limited range. The vast range of knowledge pursued in modern times requires such specialization of inquiry. Even larger phenomena, such as global warming, are studied by examining constituent parts, which may involve computers analyzing many millions of data points. Such attention to specific instances and details is a reasonable way to proceed, because the broad conclusions are based upon often large sets of reliable data.

However, while agreeing in principle with the method of the objective approach, Maharishi points out the drawback of being limited to this approach: it provides incomplete and fragmented knowledge of natural law. In its dedication to isolated areas of knowledge, it also magnifies the individual's isolation from the environment, which is already a characteristic of waking consciousness. Maharishi observes that "incomplete knowledge, based on isolated areas of experimental investigation, has created a society full of problems and suffering, in which it is difficult to live a healthy and happy life."⁹

The dangers of partial knowledge are evident in the harmful side effects of modern medicine, industrial and chemical pollution of our food and natural resources, and social problems that prevail despite technological advances. The destructive power of nuclear and electronic warfare and forays into an uncertain world of genetic engineering remind us that "a little knowledge is a dangerous thing." In this regard, Maharishi points out that incomplete knowledge cannot harness the total evolutionary organizing power of natural law. Partial knowledge results in continual violation of natural law in its holistic value, thus impeding progress and even, in some cases, destroying life.¹⁰

The world as we see it today is a world created by partial knowledge. Maharishi locates the basis of all problems as inadequate knowledge. While knowledge is expanding in every field of endeavor, it is still

⁸Karl R. Popper, *Objective Knowledge: An Evolutionary Approach* (London: Oxford University Press, 1972), 196.

⁹Maharishi, *Vedic Knowledge for Everyone*, 188.

¹⁰ Ibid.

fragmented and incomplete, because the objective understanding of modern science excludes complete knowledge of natural law and thus excludes the possibility of mastery of all the laws of nature.

The limitations of the objective approach of modern science arise from, Maharishi explains, not fully understanding the relationship of knowledge with the knower. The source of the hypotheses that scientists test lies outside the domain of objective scientific method. Creativity in science and the insights that generate hypotheses may arise through intuitive conjecture or imaginative speculation. The history of science is filled with examples of sudden insights, hunches, and even dreams that revealed nature's functioning and formed the basis of major breakthroughs in the field of knowledge.¹¹ In addition, the scientist must frame a research question, devise an experiment, gather and evaluate data and draw conclusions, all processes that draw upon one's subjective judgment. Reason is not necessarily the only faculty involved, even here.¹² The advantage of modern scientific method is in arriving at knowledge that possesses "intersubjective testability": others may verify it using a prescribed methodology.¹³ Yet a limitation of the hypothetico-deductive method is that the source of ideas is not in the method itself.

In summary, modern scientific method offers extensive, reliable, and verifiable knowledge, independent of the states of mind of different observers. The criteria of objective science rest upon eliminating changing subjectivity in order to establish intersubjective reliability, and upon testing theoretical principles with practical evidence. Through a combination of reason and logic with experience and experiment, scientists

¹¹The following are notable examples of intuitive insights leading to scientific progress. Archimedes' insight, while bathing, into the nature of buoyancy led him to shout "Eureka!"; Kekule's dream of a snake chasing its own tail revealed to him the structure of the benzene molecule, or benzene ring; Tesla's inspired insight led to his invention of the alternating current electric motor; Einstein's conviction that laws of nature are invariant, and furthermore, ultimately derive from a grand unified structure or "field" of natural law led to his theory of relativity and the search for ever more unified levels of physical reality.

¹²Objectivity is often assumed to carry into the process of observation itself. Scheffler, among others, argues that here, too, subjectivity is involved. He reflects, "there seems to be good psychological reason to suppose that observation is not at all a bare apprehension of pure sense content, but rather an active process in which we anticipate, interpret, and structure in advance what is to be seen." Israel Scheffler, *Science and Subjectivity*, 2nd ed. (Indianapolis IN: Hackett Publishing Co., 1982), 13.

¹³Popper, *Logic of Scientific Discovery*, 44–45.

develop and systematically test coherent bodies of theory. This basic procedure has led to a tremendous amount of new knowledge and technology for the betterment of human life.

Eastern scientific method: the Vedic model ¹⁴

In order for mankind to create an ideal world and live the life of happiness, perfect health, abundance and creativity that everyone would like to have—an ideal, heavenly life—new knowledge is needed. Complete knowledge, Maharishi explains, is available in his Vedic Science, which integrates subjective and objective methods. The subjective approach, or knowledge of the knower, is the basic foundation of this science.

Consciousness, Maharishi points out, is pure subjectivity. Traditionally, Vedic Science—the science of consciousness—has been a subjective science. The idea of a “subjective science” seems to be self-contradictory according to the modern view of science, in its aspirations to be thoroughly objective and thereby reliable. However, Maharishi points out that if the subject, or knower, does not know her own non-changing status, knowledge will never be fully reliable. He also indicates that the reliability of knowledge relates to its completeness. Because objective knowledge is always isolated and fragmented to some degree, its reliability is threatened by yet unknown areas.

In this regard, modern physics and measurement theory have revealed that the observer affects the observed. If the observer or knower is removed, the equation is incomplete; who is it who knows, and what, therefore, is the basis for knowledge? Furthermore, we have seen that according to Maharishi Vedic Science (and parallel to the unified field theories of modern science), the unmanifest field of life—identified by the Vedic literature as a subjective field of pure consciousness—is the basis of the entire objective (and subjective) manifest universe. Hence, Maharishi emphasizes that if knowledge of the subjective field is missing, knowledge can never be complete or even well-founded, and life

¹⁴By referring to Eastern methodology as “Vedic,” the author does not intend to denigrate other traditions of knowledge from various parts of the Orient such as China or Japan. Just as many contributions to modern science and technology come from ancient China, the Arab nations, etc. so are subjective traditions (generally referred to as “mystical”) recorded in Western civilization, in the Platonists, the Catholic tradition, and so forth. Maharishi distinguishes Eastern and Western approaches based upon the historical prevalence of one over the other.

based on incomplete knowledge cannot be fully effective, progressive and fulfilling.¹⁵

Maharishi Vedic Science investigates consciousness in two ways: direct experience, corresponding to experimental evidence in the standard model of science; and intellectual understanding, corresponding to theory and logic. Maharishi's complete experience of consciousness has given rise to the theory of his Vedic Science, which is verified by the texts of the Vedic literature. For those who are developing higher states of consciousness, experience validates theory at each stage of progress. Experience is also tested by empirical research in the Science of Creative IntelligenceSM. This research adds, in turn, to the body of theory of Maharishi's science of consciousness. Within different modern disciplines, the Science of Creative Intelligence connects each newly unfolding part of knowledge with the total knowledge of the discipline and the discipline as a whole with the common basis of all disciplines: the field of pure intelligence, the Self of the every student. Maharishi connects experience and understanding in theory and in practice:

The advantage of intellectual understanding of complete knowledge on the ground of the pure intelligence of the student is that the student finds himself to be the lively centre of all knowledge; he finds all diversified values of knowledge in the context of total knowledge (Veda) within his own consciousness, within his own holistic awareness—his awareness upholds the creativity and organizing power of Veda, which is always lively as the basic intelligence within his own physiology.¹⁶

Whereas the objective scientific approach utilizes outward sensory perception, the subjective Vedic approach turns the attention inward toward the transcendental field. On the basis of this outward versus inward orientation, for modern science matter is primary, while for Vedic science consciousness is primary. Many well-known modern scientists would dispute the existence of pure consciousness at all.¹⁷

¹⁵ Maharishi, *Vedic Knowledge for Everyone*, 186–189.

¹⁶ *Ibid.*, 24–25

¹⁷ Materialists argue that consciousness is an epiphenomenon arising from the physical human nervous system: “the ghost in the machine.” E.g., F. H.C. Crick, “Thinking About the Brain,” *Scientific American Offprint*, 1984, 17; Patricia Churchland; Daniel C. Dennett, *Consciousness Explained* (Boston: Little, Brown and Company, 1991).

However, the Vedic scientist has experienced the different levels of mind during the transcending process. He recognizes, based on this personal experience and supported by the testimony of the Vedic literature, that there are different levels of nature as a whole, and the deepest of these and source of all the others is pure consciousness. Maharishi furthermore points out that knowledge of creative intelligence is verifiable on each of these levels.¹⁸

Modern scientists, also, acknowledge that nature is found in layers, from subtle to more complex and manifest. However, without the direct experience of pure intelligence, they generally do not recognize the unified source of all the layers of natural law. Modern science can only take the scientist to the door of the unmanifest and give a glimpse of the transcendental reality through mathematical descriptions in quantum physics.¹⁹ Some scientists—Eddington, Einstein and others—have arrived at the intuitive conclusion that such a unified level of nature must exist, but modern science has been (and will continue to be) unable to directly verify this because of the inadequacy of manifest instruments for locating the unmanifest.²⁰

Maharishi observes that the very formulation of a law of nature is an impulse of consciousness of the scientist, “that realizes the very fundamental character of its own existence—unbounded awareness becoming transformed into boundaries.”²¹ Maharishi describes pure consciousness as the “Home of all the Laws of Nature.”²² Enlivening this field has comprehensive and practical results, as he notes in the following passage:

When the source of nature, pure knowledge, which is infinite organizing power, is lively in the awareness, every thought and action will be very profound and completely evolutionary. This will bring about a bright future for the world: the creation of an ideal society.²³

¹⁸ Maharishi, *Science of Creative Intelligence*, 6, 6–7.

¹⁹ Maharishi, *Life Supported by Natural Law*, 29, 31.

²⁰ Hagelin, “Restructuring Physics,” 4, 7–8.

²¹ Maharishi, “Structure of Pure Knowledge,” 75.

²² Maharishi, *Vedic Knowledge for Everyone*, 100.

²³ Maharishi, “Structure of Pure Knowledge,” 80.

**Scientific character of research in consciousness:
the *Transcendental Meditation* and *TM-Sidhi* programs**

The Transcendental Meditation and TM-Sidhi programs, because they develop higher states of consciousness, are the foremost research approaches of Maharishi Vedic Science. They raise the subjective approach of gaining knowledge to a science by establishing a nonchanging level of consciousness in the knower. The awareness of the knower is the research tool in this approach; hence the subjective approach seeks to establish a non-changing state of awareness as the ground for all experience. Knowledge that is variable in the waking state of consciousness is invariable in Transcendental Consciousness, where the knower exists in her unbounded, eternal status. Thus the basis for a scientific, i.e., invariant and reliable subjective state of consciousness, is to identify and stabilize the mode in which consciousness is entirely self-referral.²⁴ Stabilization requires both analysis (waking state activity and intellectual comprehension) and synthesis (transcendental experience, unified awareness), a point that Maharishi explains with an analogy:

Science is the systematic path of gaining knowledge. Science demands that for knowledge to be reliable both directions of approach (analysis and synthesis) must be properly covered. The reason is that when a student goes from his home to his school he sees the path with one kind of background, but when he returns from school, coming back home, he walks on the same path but experiences a completely different background. Complete knowledge of the path from both directions is very necessary in order that the path is not lost at any time.²⁵

Thus Maharishi's Vedic theme of gaining knowledge is from Self (*Atma*) to Veda to Universe (*Vishwa*) and back again. This self-referral development occurs through growth of consciousness. In Transcendental Consciousness the knower, the known, and the process of knowing all exist in one singularity of pure awareness. Maharishi points out that this state has been described in remarkably similar terms by different people in different ages, cultures, and traditions.²⁶ Earlier we described how Transcendental Consciousness is stabilized in Cosmic Conscious

²⁴ Maharishi, *Vedic Knowledge for Everyone*, 42–46.

²⁵ Ibid., 41–42.

²⁶ Maharishi, *Vedic Knowledge for Everyone*, 224–228.

ness, and on that basis, how perception becomes more refined in God Consciousness, until the gap between the Self (*Atma*) and non-Self (*Vishwa*) is bridged in Unity Consciousness.

Maharishi Vedic Science describes Unity or Brahman Consciousness as the supreme level of human development. In this state, the non-changing unbounded awareness that was once experienced as transcendental has become so thoroughly integrated that one lives and perceives everything from this level. Only in the state of Unity can one really be said to be a fully trained Vedic scientist; everything is known in its unbounded status. In this state, Maharishi explains, knowledge and fulfillment through knowledge are complete.²⁷ Everything is perceived in the light of the Self: “the object is cognized in terms of the pure subjective value of unbounded, unmanifest awareness.”²⁸ At this level, knowledge is self-sufficient, and fully scientific in nature:

This is the field of pure knowledge, supreme knowledge, which is its own verification. This is the supreme climax of knowledge being scientific, where knowledge is its own fulfillment, its own proof, its own validity.²⁹

Thus, Maharishi’s integrated approach to gaining knowledge is based on the profound Vedic insight that human beings have a direct connection with natural law through the mind. The scientific character of research in consciousness in Maharishi Vedic Science rests on this insight. Maharishi points out that mind is the link between purely subjective consciousness, the Self (*Atma*), and the body, its objective manifestation. Pure consciousness, as seen earlier, is the home of all the laws of nature. There is no way to contact pure consciousness objectively (although it may be glimpsed), but there is a subjective method, the Transcendental Meditation and TM-Sidhi programs. These premises all arise from the experience and theory of Maharishi Vedic Science.

The purpose of modern science is to understand how nature works and thus to satisfy our intellectual curiosity about the world by yielding reliable knowledge. Certain principles make knowledge reliable. The most basic principle is that whatever the subject matter, it must be pur-

²⁷ Maharishi, *Science of Creative Intelligence*, 24–7.

²⁸ *Ibid.*, 23–9.

²⁹ *Ibid.*, 6–

sued systematically. Systematic investigation in science implies the use of logic in evaluation of data, for theory is based upon logic and reason. One needs a theory that is internally logically consistent, or coherent, in order to derive test implications. A systematic approach also allows an investigation to be logically evaluated and communicated as well as replicated. Another principle is that science must be a public enterprise, open to systematic and repeatable testing by anyone (with the requisite skills), and the findings publicly shared in order to establish intersubjective agreement. Philosophers of science and practicing scientists alike generally agree on these basic constituent elements of scientific inquiry.³⁰ Maharishi's program of research in consciousness will now be considered with respect to these criteria.

The Transcendental Meditation program is the path of personal experience, the experimental technique by which one may test the theory of Maharishi Vedic Science. This technology is both taught and practiced in a systematic, simple, and natural manner. The Transcendental Meditation technique is taught in exactly the same way around the world; instruction is uniform because the essential nature of the mind is the same, regardless of individual or cultural differences. It is publicly available, for anyone who can think can meditate and not even literacy is required. This technique is also practiced in the same way by everyone, based upon the natural tendency of the mind. Hence this subjective research simply takes advantage of automatic mechanisms of the thinking process. The instrumentation is the human nervous system. In other subjective approaches—such as introspection or contemplation—the individual is conducting the process, which therefore may or may not be systematic or universal. During the Transcendental Meditation practice, the individual exercises volition in beginning and continuing the technique, but the process itself is entirely automatic; it spontaneously engages certain mechanisms of natural law. In this sense, then, practice of the Transcendental Meditation technique does not rely on individual inception; nature does it.

Maharishi points out that nature is uniformly systematic, precise, and orderly in its functioning. He observes, for example, that “everything in nature—planets, solar systems, galaxies—goes on with perfect

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³⁰ E.g., Quine and Ullian, *Web of Belief*, 3–4; Scheffler, *Science and Subjectivity*, 1.

orderliness.”³¹ Referring to another level of natural law, he explains that self-referral activity “is the most refined level of quantum-mechanical activity of nature, from where absolute orderliness controls, commands, and governs all affairs of the universe.”³² Hence because the technique of Transcendental Meditation is entirely natural, it is most systematic.

Transcending commonly includes, in its earlier stages, experience of unbounded awareness, deeper levels of mind, profound rest and relaxation, and positive, progressive results in activity. This is knowledge on the path to enlightenment; it verifies key theoretical propositions of the Science of Creative Intelligence and Maharishi Vedic Science. Consequently, even a new practitioner of the Transcendental Meditation technique can appreciate the possibility of higher states of consciousness based on the growth of her own personal experience of waking, dreaming, sleeping, and Transcendental Consciousness.

Maharishi explains that growth of understanding based on experience of higher states of consciousness culminates in Brahman Consciousness. He indicates that the Transcendental Meditation and TM-Sidhi programs develop this highest state of consciousness. In this state, Maharishi points out, knowledge is as self-evident as sensory observation is in another state of consciousness, for it is self-referral, non-variant (therefore stable and reliable), and comprehensive. This is knowledge at the goal of evolution—enlightenment—where knowledge is its own proof and validity. Knowledge gained on this level is true, complete, and fulfilling, because every perception or thought is in the light of the boundless, holistic awareness of the Self (*Atma*). We can therefore accept the premise of higher states as the basis of a reasonable research program based on a coherent body of theory, personal experience, and the voluminous testimony of those who have experienced these states firsthand, the great maharishis of the past and the present.

In comparing modern science with Vedic Science, we note that a standard premise in science is its “ideal that subjects all scientific statements to the test of independent and impartial criteria, recognizing no authority of persons in the realm of cognition.”³³ Maharishi Vedic Science conforms to these criteria. Maharishi is the leading exponent and

³¹ Maharishi, *Life Supported by Natural Law*, 74.

³² *Ibid.*, 75.

³³ Scheffler, *Science and Subjectivity*, 1.

ultimate authority on his Vedic Science at this time, uniquely qualified by virtue of his supreme development of consciousness. However, Maharishi does not encourage anyone to depend solely on his authority, but for thirty-eight years has been encouraging others to develop their own consciousness through his Transcendental Meditation and (since 1977) TM-Sidhi programs. Increasing numbers of practitioners of these programs are achieving sufficient depth of experience to validate the principles he has elucidated, based on the Veda and Vedic literature. Maharishi acts as a guide and a teacher. In basic Science of Creative Intelligence lectures he draws upon commonly accessible objective or subjective evidence to support and illustrate his statements. The basic tenets in the introductory course on the Science of Creative Intelligence include such ideas as, “rest and activity are the steps of progress,”³⁴ and knowledge leads to action, which in turn leads to achievement, which results in fulfillment.³⁵ These statements can be confirmed by anyone’s experience in the waking state of consciousness, and by logical reasoning.

As the collective experience of consciousness has become deeper and more abstract, so has the body of theory in the Science of Creative Intelligence and Vedic Science. Maharishi developed his descriptions of higher states of consciousness when people began describing experiences of those higher states. In other words, the theory has developed and unfolded from the Vedic literature to correspond to empirical evidence. Statements about such abstractions as the structure of pure knowledge and the self-referral dynamics of consciousness again are based on direct personal experiences. Maharishi explains, for example, that “in the TM-Sidhi program we have experimental evidence on the experiential level that the pure structure of knowledge is capable of creating from within itself.”³⁶

Two central propositions of the Science of Creative Intelligence are “knowledge is structured in consciousness” and “knowledge is different in different states of consciousness.” Insofar as science concerns itself with understanding, and considering that knowledge (including understanding) is different in different states, modern science is limited by approaching knowledge

³⁴ Maharishi, *Science of Creative Intelligence*, 1–2.

³⁵ *Ibid.*, 6–3.

³⁶ Maharishi, “Structure of Pure Knowledge,” 79.

in waking state alone. Whereas in modern science, due to specialization any individual researcher knows “more and more about less and less,” and thus one’s knowledge excludes more and more, in Vedic Science, for an individual researcher there is an increasing range of experience as consciousness develops. It is apparent, therefore, that one’s state of consciousness is crucial with respect to knowledge. Some knowledge may be inferential at present, such as knowledge of the highest states, and some direct, such as understanding of the first three and perhaps the fourth or fifth states. However, complete knowledge is available to anyone through development of consciousness.

The Science of Creative Intelligence also holds that the nature of life is to move toward fulfillment, which is only fully and permanently experienced when one is enlightened. Earlier we described enlightenment as a state in which one’s awareness is fully in accord with the impulses of natural law. It is therefore a state in which thought and action are spontaneously right (with respect to cosmic law), useful, and fulfilling to both the actor and the surroundings. Maharishi emphasizes that right action cannot be intellectually determined.³⁷ One who has this understanding and who practices the Transcendental Meditation technique for rising to enlightenment does not have a vested interest in holding onto a particular world view; one wants to enlarge one’s understanding and recognizes that ideas and perceptions will change as consciousness grows. To this end, all the theory of the Science of Creative Intelligence and Maharishi Vedic Science is measured against personal experience and observation, logical reasoning, and historical record.

Maharishi Vedic Science thus conforms to the criteria that scientific inquiry be open—not biased—and accessible to public testing. Vedic Science is publicly accessible and universally verifiable through practice of the Transcendental Meditation technique, which cultures the human nervous system and raises it to its full potential. Human consciousness based on a fully matured and stress-free nervous system is the primary instrument of this science, since knowledge of consciousness is ultimately self-referral and self-validating. Additional support for this subjective scientific approach comes from the more than 500

³⁷ Maharishi, *Life Supported by Natural Law*.

research studies that objectively verify the experiential claims of the Science of Creative Intelligence.³⁸

The value of understanding and theory in science is in organizing large amounts of experience or data within one integrated explanation. Science is interested in both universal and specific expressions of natural law. Scientific theory therefore organizes information that is derived from repeated empirical or experiential testing. Experience is specific, understanding is general. From a general theory, in turn, specific hypotheses may be deduced, and from these, specific test implications. Replication of experience builds confidence in a theory until, over time, it becomes accepted as a law. This is the standard hypothetico-deductive model of modern science. As the scientific community reaches an understanding, a whole galaxy of experience is no longer foreign. The purpose of science therefore includes development of increasingly integrated and comprehensive theory.

Acceptance in science is not a matter of proof, since it is not possible to test all instances of a law. Acceptance may mean only that a hypothesis is taken seriously enough to be employed as a leading principle of research and testing with no commitment as to its truth value. Here the crucial element is the existence of shared scientific methods of control that allow hypothesis-testing.³⁹ Indoctrination that stifles the development of critical thinking patterns would hinder the free development of science and technology, and thus hinder the advancement of civilization. Maharishi Vedic Science does not involve indoctrination. Whether one accepts or does not accept the theories of Maharishi Vedic Science, this science holds that as one develops higher states of consciousness, attunement with natural law increases until one ceases violating any laws of nature and life becomes fully progressive and fulfilling. Scientific research documents the improved quality of individual and social life resulting from practice of the Transcendental Meditation and TM-Sidhi programs.⁴⁰

Maharishi affirms that “knowledge and experience complement each other.”⁴¹ Each adds to and builds upon the other. As described

³⁸ Please refer to Orme-Johnson, Farrow, et al., eds., *Collected Papers. Vols. 1*; Chalmers et al., Vols 2–4; Wallace, et al., Vol. 5; Dillbeck, et al., Vol. 6..

³⁹ Scheffler, *Science and Subjectivity*, 86–87.

⁴⁰ Please see Maharishi European Research University, *Results of Scientific Research*.

⁴¹ Maharishi, *Science of Creative Intelligence*, 1–25.

earlier, the most comprehensive and integrated theory of life and of consciousness is recorded in the Veda and Vedic literature, as brought to light and presented in one integrated framework by Maharishi. His Transcendental Meditation and TM-Sidhi programs allow one to verify this theory while at the same time developing the capacity to fully understand it.

This capacity is vital, for progress in science requires gathering additional data or experience and refinement of procedures and instrumentation. Each sitting of this meditation provides further experience and an intrasubjective test of the theory of Vedic Science—i.e., within the individual. In addition, experience of the program can be articulated, that is, described and compared with others for intersubjective verification. Furthermore, with the standardized program procedures the practice gradually refines the instrumentality of the individual nervous system, until it reaches a state of maximum refinement in Unity Consciousness.

This direction of increasing refinement and integration of the awareness and physiology has been confirmed by experience, theory, and objective research.⁴² In this way Maharishi Vedic Science confirms subjective experience with objective verification, thereby increasing confidence in the reliability of the knowledge. Experiential results can be operationalized and objectively investigated. They can also be compared with the traditional testimony found in the Vedic texts. These are three methods of validation of knowledge.

Hence the systematic procedure of this meditation day after day is itself a scientific research program that allows the practitioner to test the theory of Maharishi Vedic Science. First, the technologies for research in consciousness satisfy the criteria of experimental procedures in modern science, as expressed in the standard definition of science. The Transcendental Meditation and TM-Sidhi programs are systematically taught and practiced, and are available to anyone; they therefore offer universal replication of tests of the theory of Maharishi Vedic Science. This universality of method establishes the basis for wide intersubjective agreement, increasing confidence in the results. Second, the experience provided by the technique can be logically understood and

⁴²David Orme-Johnson, "The Cosmic Psyche as the Unified Source of Creation: Verification through Scientific Principles, Direct Experience, and Scientific Research," *Modern Science and Vedic Science*, 2(2) 1988, 164–221.

interpreted in the light of a coherent theory. The “data” (including both experience and empirical research) point toward higher development of all human faculties. Because the practice is systematic and reliable, anyone who is properly trained can use it for research; this research allows one to discover through direct experience, and describe by means of an integrated theory, growing personal knowledge of consciousness. The present work demonstrates that subjective experience can be articulated with respect to the theory of Maharishi Vedic Science. Often, on that basis, the experience is measurable through objective research methods. For these reasons Maharishi concludes that, as a minimum, his Science of Creative Intelligence and Vedic Science meet the criteria of modern science:

We are more than satisfied that this subjective and objective investigation is worthy of being called a science. Its practical and theoretical aspects are open to any man for verification. At every stage of subjective experience and objective observation and analysis, its principles hold true. Thus our study of creative intelligence is a science: the Science of Creative Intelligence, which presents to us knowledge that is profound, complete, useful, and fulfilling.⁴³

In addition, Maharishi Vedic Science goes beyond the current scientific paradigm and in fact extends it, by presenting the opportunity for gaining supreme knowledge through the full development of consciousness. Maharishi Vedic Science provides a way to gain complete knowledge; it reveals all about the knower, the process of knowing and the known. In Unity Consciousness or Brahman any level of existence of an object can be explored and understood. Even before Unity, if one’s awareness is established on the level of *ritam-bhara-pragya*—the subtlest level of knowing—one can gain reliable, complete knowledge subjectively. Knowledge can be complete in Unity because one is established in the state of knowingness. Maharishi explains that although one will not know everything in the relative sense, awareness is established in the “home of all knowledge, the home of all the laws of nature,” and therefore anything can be known as needed. Vedic Science is thus based in wholeness and includes more and more, whereas modern science as

⁴³ Maharishi, *Science of Creative Intelligence*, 6–8.

we saw above isolates partial values of knowledge and in this sense excludes more and more (for any individual researcher).

The Vedic literature records very definitive and clear descriptions of the state of Unity. But without a reliable and systematic means to realize higher states of consciousness, these descriptions have remained obscure and have been viewed by most modern cultures—Eastern as well as Western—as not only fanciful, unreliable, and virtually unobtainable for the modern householder, but what is more important for this discussion, “completely outside the realm of precise definition or scientific research.”⁴⁴ The traditional limitation of subjective approaches has been their unreliability, privacy, esoteric nature, and lack of a coherent underlying theory.

In summary, Maharishi Vedic Science has introduced a systematic technology of consciousness that efficiently develops the experience of higher states of consciousness for anyone. It also provides a coherent and complete theoretical framework for the full understanding of development of consciousness.

Applications of Vedic Science

Maharishi holds that the significance of knowledge depends upon the degree of organizing power it possesses. Pure knowledge enlivens in the brain of anyone the same total evolutionary organizing power of natural law that sustains the entire universe. The total potential of natural law is holistic and perfectly reliable. The search of modern science for reliable knowledge is a process of seeking to understand the laws of nature one by one. Maharishi points out that although it is not possible to intellectually know all the laws of nature, it is possible to function in accord with and essentially be all the laws of nature, by establishing one's awareness in the home of natural law, pure consciousness.⁴⁵ Maharishi describes, “the field of complete knowledge is the seat of infinite organizing power.”⁴⁶

Hence Maharishi Vedic Science upholds the human brain physiology as the hardware of a “cosmic computer” that only needs proper

⁴⁴ Lawrence H. Domash, introduction to *Collected Papers*, Vol. 1, eds. Orme-Johnson and Farrow, 14.

⁴⁵ Maharishi, *Vedic Knowledge for Everyone*, 189–190; Dillbeck, “Experience of the Ved,” 148.

⁴⁶ Maharishi, *Government*, 264.

programming to deliver any desired result.⁴⁷ Regular experience of Transcendental Consciousness—the field of pure knowledge—in time brings all thought and action spontaneously into accordance with natural law. In the Vedic subjective approach to knowledge, knowledge is spontaneously transformed into development of consciousness and manifests as the increasingly more refined and integrated psychophysiology needed to support further growth of consciousness.

This integration of approach and application displays the unique character of Maharishi Vedic Science. Both Vedic science (in recent times) and modern science have historically kept separate pure theory and its applications. In modern science, for example, a gap exists between pure and applied knowledge, between the pure theoretician and the experimentalist or, even more so, the engineer. In this approach, the laws of nature have to be discovered before they can be applied. On the other hand, sometimes researchers discover new applications without understanding how they work.

Whereas modern science describes natural law and there may or may not be practical applications, Vedic Science allows direct experience of natural law by enlivening it in the consciousness of the individual. That is, in the transcending process the home of all the laws of nature is enlivened, and when natural law is lively it manifests its organizing power automatically. Maharishi summarizes many of these ideas in the following passage:

Being objective in its approach, modern science brings only intellectual understanding about the functioning of the Laws of Nature. It does not penetrate into the life of the scientist. It does not integrate his personality. He can do some little jugglery here and there in the field of creation, converting this into that and that into this, but he himself is open to all kinds of destructive values because the modern approach to the investigation of Natural Law does not and cannot enable the scientist to imbibe knowledge and live it in daily life.⁴⁷

Vedic Science has a different character. It unfolds the reality. It is the total science of all aspects of life, subjective, objective, and the connection between subjectivity and objectivity. It intellectually analyzes all values in the field of relative life and in the absolute state of self-referential consciousness. And the approach of Vedic Science is such that the

⁴⁷ Maharishi, *Vedic Knowledge for Everyone*, 190–191.

knowledge gained enlivens that most fundamental value of consciousness from where all thoughts and actions come out. Therefore, the very methodology of gaining knowledge through Vedic Science is such that as one sees the knowledge of Natural Law on the intellectual level one begins to live that Natural Law in daily life in a most spontaneous way.⁴⁸

Thus Maharishi Vedic Science integrates pure and applied science. In fact, this integrated approach is weighted toward application. Throughout his teaching, Maharishi has not encouraged the pursuit of knowledge for its own sake, but rather for its ability to improve the life of the individual and society. "Knowledge always has a purpose," he explains, and leads to fulfillment.⁴⁹ Therefore, reading the Vedic literature as research in Maharishi Vedic Science is not pursued solely to satisfy intellectual curiosity, but as an activity to further enliven the total potential of natural law in the psychophysiology of the student and in the environment.

In summary, it is often assumed that modern scientific knowledge is pursued not only for greater understanding of natural law but also for its technological applications. This, however, is not necessarily the case, as seen in the distinction between "pure" and applied research. While pure research may lead to applications, there is no guarantee that these applications will be used for the social welfare; indeed, debates often rage about the value of a given technology due to the lack of clear standards for evaluating its life-supporting or life-damaging effects. In any case, in modern science there is always a time lag between theoretical research and application, and conscious effort is required to apply newly discovered aspects of natural law for practical benefit.

Unlike modern science, Maharishi's programs of research in consciousness are spontaneously applied. As soon as any degree of knowledge is gained, it expresses its organizing power in the very same stroke. The rationale for this has been explained: organizing power is inherent in knowledge. For example, mathematical laws of nature in modern science are descriptions of active organizing principles of intelligence in nature. While this principle expresses itself to some degree in waking state, higher states of consciousness are states of greater knowledge spontaneously possessing correspondingly more organizing

⁴⁸ Maharishi, *Life Supported by Natural Law*, 34–35.

⁴⁹ Maharishi, *Science of Creative Intelligence*, 24–7.

power. Maharishi Vedic Science posits that experience enlivens creative intelligence directly, through the medium of attention, with immediate results. Thus Unity Consciousness, the state of supreme knowledge, has the widest applications that are at the same time unfailingly life-supporting and fulfilling. Maharishi explains the supreme value of this subjective approach:

Knowledge always has a purpose. The purpose of knowledge is effective action. The purpose of effective action is achievement. The goal of achievement is fulfillment. So the purpose of knowledge, which is ultimately the fulfillment of the knower, is best served directly through subjective means of gaining knowledge.⁴⁹

He observes that the subjective approach becomes reliable and complete in Unity Consciousness:

The subjective means of gaining knowledge on that level of consciousness which never changes—on the seventh level of consciousness—opens to direct cognition the infinite value that abides in every object. With that infinite, unbounded value of the object opening to awareness, knowledge is complete. There is nothing more to be known. Knowledge will be self-sufficient on that level, and fulfilling.⁵⁰

Scientific character of a research program of reading the Vedic literature, based on research in consciousness, in Maharishi Vedic Science

Reading the Vedic literature, according to Maharishi Vedic Science, also satisfies the standard definition of science and thereby qualifies as a scientific research program. As noted above, the first criterion of scientific inquiry is that theory be systematically verified by experience. In the case of reading Vedic literature, the technique of inquiry reflects the nature of the subject matter. Maharishi has gathered all the traditional Vedic literature into a holistic and highly systematic framework for the first time in recorded history. He has described the nature of the Vedic literature as the eternal embodiment of the complete sequential structure of natural law, “the absolute, sequential, orderly unfolding of the Veda within the nature of the self-referral unified state of consciousness.”⁵¹ Maharishi’s *Apaurusheya Bhasya* reveals the dynamics

⁵⁰ Ibid., 24–7.

⁵¹ Maharishi, *Vedic Knowledge for Everyone*, 20.

of consciousness encoded in the sequence of syllables and gaps. The procedure of reading Vedic literature in Maharishi Vedic Science is to read in sequence. For example, the reader would not skip ahead to the end of a text, approaching it as one might a novel, to see the outcome. One may read in Sanskrit for the phonetic value alone. Maharishi Vedic Science predicts that reading in sequence—whether in English or in Sanskrit with proper pronunciation—automatically sets the process in accord with natural law and thereby makes the procedure most highly systematic. Thus, the results of this reading are essentially removed from the realm of individual inception. As in the Transcendental Meditation practice, the results in the mind and physiology are spontaneous, orderly, natural, and fulfilling, as predicted and recorded elsewhere in this work.

Another criterion of the scientific approach is that it is based upon coherent, logical theory that can be articulated and communicated. The corpus of Maharishi Vedic Science includes an explanation of the source, nature, and purpose of the Vedic literature. Maharishi explains that theoretical understanding of the structure and character of the Vedic literature satisfies the intellect by providing complete comprehension of

the orderly unfoldment of the structure of self-referral consciousness evolving into the sequentially progressing structure of the holistic sound of the Veda (*Shruti*), and further evolving into particles (sounds, frequencies, syllables) of speech, which in the continuing process of evolution evolve into material particles, assuming the role of the physiology and the ever-expanding material universe.⁵²

Theory leads to test implications. A test implication would be that reading the Vedic literature organizes a certain quality of life that reflects growth of natural law in one's personality. The growth of psychophysiological orderliness, integration, refinement, etc., can then be operationalized and researched objectively. The current work presents a new paradigm of *Vedic research*, in which subjective experience is compared (in this case, retrospectively) with the theory and predictions of Maharishi Vedic Science, and the researcher is the experiencer herself.

This thesis therefore addresses the third criterion established earlier, that scientific research must have an empirical component to system-

⁵²Ibid., 20–21.

atically verify theory. As set forth by Maharishi, the Vedic literature reading program relies on direct experience of correctly pronouncing the sounds in sequence. It is predicted to accelerate the development of consciousness in a holistic manner. Indeed, Maharishi Vedic Science suggests that ultimately the meaning of a text is found in the effect it has,⁵³ for in truth, the “meaning” is evident in the entire sequence of manifestation.

An additional criterion is that anyone with proper training can replicate the experiment or experience; it is a public enterprise. Reading Vedic literature is open to public testing by anyone who learns the Devanagari alphabet, for the results of reading can be described and compared.⁵⁴ The present work is a case in point. Any reader can compare personal experience to what is contained here, and more such reports are forthcoming.⁵⁵ Objective research has begun to further test and measure the results of reading Vedic literature.

Maharishi Vedic Science makes it clear that full understanding of the Vedic literature, i.e., full understanding of natural law, depends upon gaining higher states of consciousness because knowledge is different in different states. For example, cognition of the Veda and Vedic literature by the seers and rishis is the precise expression of a fully awake awareness. Since knowledge is a reflection of one’s consciousness, research in consciousness through reading Vedic literature is also a way to discover new knowledge—new for the individual and in some sense unique to the individual, due to the uniqueness of every nervous system. As the reader’s instrumentation—his nervous system—becomes more refined, knowledge expands, and conversely, as knowledge grows, the organizing power enlivened in the physiology develops a more refined and more awake instrument.

Maharishi Vedic Science predicts that reading the Vedic literature sets the brain activity in a pattern of natural, orderly flow, allowing it to function in a completely unstrained manner. Once one knows the Devanagari letters, this reading promotes stress-free brain functioning

⁵³ Maharishi, *Vedic Knowledge for Everyone*, 145, 182–183; Nader, *Human Physiology*, 200–201.

⁵⁴ As has been frequently noted, Maharishi’s predictions are based upon practice of his Transcendental Meditation program as a foundation for reading Vedic literature.

⁵⁵ See Marci F. Freeman, “Enlivening Veda in Consciousness and Physiology by Reading the Vedic literature in Conjunction with the Practice of the Transcendental Meditation and TM-Sidhi Programs of Maharishi Mahesh Yogi” (Ph.D. diss., Maharishi University of Management, 1996).

because it is an easy, natural, and simple activity. As a path to enlightenment, such reading appears to develop the instrumentality of the brain so that it functions in the same orderly sequence as natural law. These predictions further indicate that reading the Vedic literature will enliven the full potential of the reader by stimulating the connection of the individual with the total potential of natural law. In addition, because the nervous system has been found to express a universal, set Vedic pattern, individual research in consciousness can be shared and results predicted, as Maharishi has, and then verified by others.

To review the scientific character of Maharishi's program of reading the Vedic literature, (1) the program has a logical basis, derived from the theoretical foundations of Maharishi's Vedic Science; (2) the reading program systematically tests this theory with respect to the orderly nature of the Vedic texts and, more importantly, with respect to the automatic effect of the sounds on the nervous system; and (3) the program is open and publicly verifiable. This dissertation provides original preliminary evidence of the predictions set forth earlier; it is a first step in documenting results of the Vedic literature reading program and relating them to Maharishi's comprehensive theory. One may therefore conclude that reading the Vedic literature in Maharishi Vedic Science is a scientific program of research in consciousness.

Theory and practice add to and enhance one another. For example, discovery of the Veda in human physiology is a tremendous empirical and theoretical breakthrough in knowledge, and fully supports the theory of Vedic Science. Maharishi's predictions are upheld by Dr. Nader's theoretical research, which illuminates why speaking and reading the Vedic sounds enlivens the physiology. This finding accords with Maharishi's explanation that the Vedic sounds actually constitute the laws of nature, the "creative process in nature, uphold all levels of expression of nature's intelligence, and promote the infinite diversity of the ever-expanding universe."⁵⁶

Conclusion

Modern science amasses external descriptions of natural law. These descriptions lead to or support theories that enlarge our understanding of the world. Often this knowledge is translated into technologies that

⁵⁶ Maharishi, *Vedic Knowledge for Everyone*, 140.

aim to be for the social good, but in many cases prove to be a mixed blessing. Maharishi Vedic Science, on the other hand, “amasses” direct experiences of consciousness—as recorded in the Vedic literature, for example—and maximizes the range of experience of the knower by systematically developing enlightenment. This is achieved through direct and spontaneous enlivenment of natural law within the individual and her environment. Maharishi explains that his Vedic Science and Technologies produce only life-supporting effects because the direction of development is toward complete attunement with the total potential of natural law in every thought and action. Maharishi Vedic Science also employs the findings of modern science to create a more ideal environment for individual growth. As individuals grow in consciousness they express more evolutionary, progressive qualities, and may therefore be expected to use the technologies of both Vedic Science and modern science for the welfare of life everywhere and to create Heaven on Earth.⁵⁷

On a more theoretical level, Maharishi resolves the objective-subjective dilemma by pointing out that subject and object are united in the field of self-referral pure consciousness, the Samhita of Rishi, Devata, Chhandas:

We can divide unbounded awareness into its two phases—subjective and objective. There the object of observation is the subject of observation, it is observing itself. It is completely, absolutely self-referral.⁵⁸

Maharishi’s great gift to the world has been to integrate the objective and subjective approaches to knowledge in one holistic and comprehensive framework known as Maharishi Vedic Science:

to properly integrate all the different areas of the knowledge of Natural Law and make it accessible, comprehensive, and meaningful to everyone’s life—to make it practically useful for promoting health and happiness in the life of the individual and universally applicable for the peace, prosperity, and collective health of any nation, and for global harmony in the family of nations.⁵⁹

⁵⁷This phenomenon is seen in communities where large numbers of people practice the technologies of Maharishi Vedic Science, such as Maharishi University of Management and the surrounding Fairfield, IA community.

⁵⁸Maharishi, “Structure of Pure Knowledge,” 74.

⁵⁹Maharishi, *Vedic Knowledge for Everyone*, 253–254.

The present work is a personal report of the extended research in development of consciousness provided by reading the Vedic literature, and is essentially a pilot study. It is an early attempt to “scout out the territory.” This is where science begins. As experience mounts, classification systems suggest themselves, as happened even in the present case. The current program of reading the Vedic literature is not unlike early exploration: explorers go first, and later surveyors take measurements. The research is the two-and-a-half year period of reading and the daily results; this dissertation is a report of the research findings. Finally, this dissertation is part of a larger research program that has been evolving under Maharishi’s guidance and the investigation of modern and Vedic scientists around the world.

References

- Chalmers, R., G. Clements, et al., Eds. (1988). *Scientific Research on the Transcendental Meditation program: Collected Papers (Vol. 2-4)*. Vlodrop, The Netherlands, MVU Press.
- Crick, F. H. C. “Thinking About the Brain.” *Scientific American* Offprint, 1984.
- Dennett, Daniel C. *Consciousness Explained*. Boston: Little, Brown and Company, 1991.
- Dillbeck, M. C., Ed. (2011). *Scientific Research on Maharishi’s Transcendental Meditation and TM-Sidhi Programme: Collected Papers (Vol. 6)*. Vlodrop, The Netherlands, Maharishi Vedic University Press.
- Dillbeck, Michael C. “Experience of the Ved: Realization of the Cosmic Psyche by Direct Perception: Opening Individual Awareness to the Self-Interacting Dynamics of Consciousness.” *Modern Science and Vedic Science* 3, no. 2 (1989).
- Domash, Lawrence H. Introduction. David W. Orme-Johnson and John T. Farrow, eds. *Scientific Research on the Transcendental Meditation Program: Collected Papers, Vol. 1*. Weggis, Switzerland: Maharishi European Research University Press, 1977.
- Freeman, Marci F. “Enlivening Veda in Consciousness and Physiology by Reading the Vedic Literature in Conjunction with the Practice of the Transcendental Meditation and TM-Sidhi Programs of Maharishi Mahesh Yogi.” (Ph.D. Dissertation,

- Maharishi University of Management, 1996).
- Hagelin, John S. "Restructuring Physics from its Foundation in Light of Maharishi Vedic Science." *Modern Science and Vedic Science* 3, no. 1 (1989).
- Hume, David. *An Enquiry Concerning Human Understanding*. Buffalo, NY: Prometheus Books, 1988.
- Lakatos, Imre. *Philosophical Papers, vol. 1: The Methodology of Scientific Research Programmes*. Ed. John Worrall and Gregory Currie, 1st paperback ed., Cambridge, England: Cambridge University Press, 1980.
- Maharishi European Research University. *Maharishi Technology of the Unified Field: Results of Scientific Research on Maharishi's Transcendental Meditation and TM-Sidhi Programme*. Fairfield, IA: Maharishi International University, 1984. 2nd rev. ed., Vlodrop, The Netherlands: Maharishi Vedic University Press, 1990.
- Maharishi International University. *Science of Creative Intelligence: Teacher Training Program Course 1*. Santa Barbara, CA: Maharishi International University, 1972.
- Maharishi Mahesh Yogi. *Life Supported by Natural Law: Lectures by His Holiness Maharishi Mahesh Yogi*. Washington, DC: Age of Enlightenment Press, 1986. Reprinted, Fairfield, IA: Maharishi International University Press, 1988.
- Maharishi Mahesh Yogi. *Maharishi's Absolute Theory of Government: Automation in Administration*. Holland: Maharishi Vedic University Press, 1993. 2nd ed., India: Maharishi Prakashan, Age of Enlightenment Publications, 1995.
- Maharishi Mahesh Yogi. *The Structure of Pure Knowledge*. [Videotaped lecture, 27 July 1979, Seelisberg, Switzerland.]
- Maharishi Mahesh Yogi. *Vedic Knowledge for Everyone: Maharishi Vedic University, Introduction*. Holland: Maharishi Vedic University Press, 1994.
- Maharishi Vedic University. *His Holiness Maharishi Mahesh Yogi, 30 Years Around the World: Dawn of the Age of Enlightenment, Vol. 1, 1957-1964*. Holland: Maharishi Vedic University Press, 1986.
- Nader, Tony, M.D., Ph.D. *Human Physiology: Expression of Veda and the Vedic Literature: Modern Science and Ancient Vedic Science Dis-*

- cover the Fabrics of Immortality in the Human Physiology*, 2nd ed. Vlodrop, The Netherlands: Maharishi Vedic University, 1995.
- Orme-Johnson, David W. "The Cosmic Psyche as the Unified Source of Creation: Verification through Scientific Principles, Direct Experience, and Scientific Research." *Modern Science and Vedic Science*, 2 (Summer 1988).
- Orme-Johnson, David W., and John T. Farrow, eds. *Scientific Research on the Transcendental Meditation Program: Collected Papers, Vol. 1*. Weggis, Switzerland: Maharishi European Research University Press, 1977.
- Popper, Karl R. *The Logic of Scientific Discovery*, rev. ed. London: Hutchinson & Co., 1972.
- Popper, Karl R. *Objective Knowledge: An Evolutionary Approach*. London: Oxford University Press, 1972.
- Quine, W. V. and J. S. Ullian. *The Web of Belief*, 2nd ed. New York: Random House, Inc., 1978.
- Scheffler, Israel. *Science and Subjectivity*, 2nd ed. Indianapolis, IN: Hackett Publishing Co., 1982.
- Wallace, R. K., D. W. Orme-Johnson, et al., Eds. (1990). *Scientific Research on the Transcendental Meditation Program: Collected Papers (Vol. 5)*. Fairfield, Iowa, MIU Press.
- Wells, Geoffrey. *The Logical Foundations of Maharishi Science of Creative Intelligence, Part 1: Higher States of Consciousness*, Fairfield IA: Unpublished manuscript.

This article, "Can Science Include Both Objective and Subjective Approaches to Gaining Knowledge?," by Christy Kleinschnitz, Ph.D., here revised/updated, and reprinted with permission, was accepted as part of her dissertation for a Ph.D. in Maharishi Vedic Science at Maharishi University of Management.

Fundamental Principles
of Maharishi Vedic Science



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ABSTRACT

This article describes fundamental principles of Maharishi Vedic Science, the Science of Consciousness. A background is given of the founder of this discipline, His Holiness Maharishi Mahesh Yogi, and of the ways in which this discipline integrates modern science and the ancient knowledge of Veda and the Vedic literature. Then fundamental principles of this discipline are explained—for example, the existence of and methodologies for accessing the transcendent field of life, the self-interacting dynamics of this field and the resulting frequencies at the basis of physical existence, and unique features of the language of nature which emerge from these self-interactions.

Introduction

The paper explores basic principles set forth in Maharishi Vedic Science. Maharishi Mahesh Yogi is the founder of Maharishi Vedic Science, the founder of Maharishi University of Management, and the founder of the technologies of Maharishi Vedic Science including the Transcendental Meditation and TM-Sidhi programs.

Maharishi is widely considered to be the leading expert in the field of consciousness in the world today.¹ From 1958, Maharishi traveled the world, teaching the Transcendental Meditation technique and (from 1976) the TM-Sidhi program, training teachers of these and other programs, establishing universities and institutes, founding the Global Country of World Peace and appointing and training its leaders, and founding organizations for teaching the methodologies of Maharishi Vedic Science in a wide array of settings, including education, business, health, rehabilitation, defense.

Maharishi Vedic Science is based upon the ancient Vedic tradition, a complete body of knowledge of consciousness, which was passed through a long line of illustrious teachers who, having attained the highest development of human consciousness, served as custodians and teachers of this knowledge for thousands of years. The Vedic tradition has been referred to as the “oldest continuous tradition of knowledge in existence.”² Maharishi spent decades enlivening this ancient tradition,

¹ Since a custom has been established in the West of addressing Maharishi Mahesh Yogi simply as “Maharishi,” this convention is retained in this paper for the sake of simplicity.

² This quote by Dr. Ken Chandler, an expert in Maharishi Vedic Science and scholar in the ancient Vedic tradition, is supported by other scholarly research, e.g., Agrawal and others.

reorganizing and restructuring the knowledge, which had become scattered, misinterpreted, and misunderstood, and integrating this tradition with the principles of modern science. Trained in physics during his college years, Maharishi brought the knowledge of and commitment to a scientific approach to knowledge to the Vedic tradition, integrating the knowledge with scientific methodology so that the parts of Vedic understanding became integrated and clear, practical, systematic, and verifiable, both subjectively and objectively. Dr. Kenneth Chandler (1987) summarizes the integration of these two approaches to knowledge: "The name 'Vedic Science' thus indicates both the ancient traditional origins of this body of knowledge and the modern commitment to experience, system, testability, and the demand that knowledge be useful in improving the quality of human life" (p. 8). Maharishi (1994) defined his Vedic Science as "the Science of Consciousness," and "the holistic science that unfolds the total reality and offers all possibilities" (pp. 156–159). As such, the technologies of Maharishi Vedic Science involve exploration of the deepest, most expanded levels of human consciousness, the most profound inner experience, natural to life and yet rare in human experience. The Transcendental Meditation and TM-Sidhi programs allow direct experience of the unbounded field of pure consciousness at the basis of all life. Maharishi refers to these programs as research in consciousness: Maharishi Vedic Science includes both subjective and objective research. In terms of objective research, scientists have measured physiological correlates of Transcendental Consciousness, and of higher states of consciousness, and have also measured a wide array of results in daily life on the levels of mind, body, and behavior that reveal the gradual growth of consciousness. They have also, in the past decades, done research on societal effects of large groups practicing these technologies. In terms of subjective research, millions of people around the globe practice the Transcendental Meditation technique, and tens of thousands practice the TM-Sidhi program. As these programs are practiced twice a day, practitioners are researching their own consciousness and exploring the field of all possibilities at the basis of the human mind. This paper presents fundamental principles of Maharishi Vedic Science.

Consciousness: The Transcendent, Unmanifest Reality at the Basis of Life

Maharishi Vedic Science is a science which expands the sphere of study of modern science to include the full range of subjective and objective phenomena, which offers technologies for exploring the full range of existence, including what is ordinarily considered a transcendental sphere of life—the field of pure consciousness—and which presents theories of the nature of the realm of pure consciousness which are open to scientific verification through the direct experience of practitioners of these technologies and through the standard objective research of modern science.

Fundamental to Maharishi Vedic Science is the understanding of this field of pure consciousness. As Maharishi (1994) explains, “All life emerges from and is sustained in consciousness. The whole universe is the expression of consciousness” (p. 68). In considering the term consciousness, it is significant to note that, in this context, the term does not refer simply to the ever-changing array of thoughts and sensations one experiences in everyday life, as this term is used in a non-technical sense. In Maharishi Vedic Science, the term consciousness is used, rather, to refer to a field of infinite intelligence at the basis of creation, the most fundamental level of the natural world, the essence of existence. As Maharishi (1994) explains, “Thus existence is intelligence, it is consciousness. Consciousness is the existence of everything, and consciousness is the intelligence of everything” (p. 58).

Over forty years ago, Maharishi (1995d) analyzed this field of existence and intelligence in great detail, using the term Being (absolute Being or absolute field of pure Being or simply Absolute) to refer to the field of existence, or intelligence, or consciousness, and the term relative (or relative field) to refer to the ever-changing world of diversity that is the manifest universe.

Underneath the subtlest layer of all that exists in the relative field is the abstract, absolute field of pure Being, which is unmanifested and transcendental. It is neither matter nor energy. It is pure Being, the state of pure existence. This state of pure existence underlies all that exists. Everything is the expression of this pure existence or absolute Being which is the essential constituent of all relative life. (p. 23)

As this quote indicates, the field of Being, or consciousness, consists neither of matter nor energy, but lies “underneath the subtlest layer” of the physical universe: it is unmanifest, a state of “pure existence.” At the same time, consciousness is “the essential constituent of all relative life”; everything in the phenomenal world is an “expression of this pure existence.” Maharishi (1995d) elaborates upon the nature of this field as follows:

As the omnipresent, essential constituent of creation, Being lies at the basis of everything, beyond all relative existence, beyond all forms and phenomena. Because it has Its pure and full status in the transcendent, It lies out of the realm of time, space, and causation, and out of the boundaries of the ever-changing phenomenal field of creation. It is, It was, It will be, in the status of Its absolute purity. It always has the status, which knows no change, the status of eternal life. (p. 26)

The Vedic literature, the literature of the ancient Vedic wisdom of life upon which Maharishi Vedic Science is founded, is filled with descriptions of this field of consciousness, or Being, and stories conveying its significance. For example, the Chāndogya Upanishad contains a story of a young man who, having returned home after years of study, was filled with arrogance and conceit. He was, in consequence, challenged by his father to learn “the essence of all knowledge.” When the son, realizing he had not received this from his teachers, asked to receive this essence of knowledge, the father replied, “Very well, my son. In the beginning there was pure Being, one without a second” (Shearer, 1978, pp. 63–64). That is to say, the initial understanding of the basic truth of life begins with an understanding of pure consciousness, here called “pure Being,” as the essence of life.

A series of books on Maharishi Vedic Science published in the past fifteen years explains the relationship between the nature of this field of existence or consciousness and human life in some detail. In the following quote, for example, Maharishi (1995b) explains consciousness as the prime mover of life.

Consciousness is fundamental to life. It is the prime mover of life. Every word that we speak and every act that we perform is the impulse of consciousness. All speech, action, and behavior are fluctuations of consciousness. All life emerges from and is sustained in consciousness. The whole universe is the expression of consciousness. (p. 19)

As indicated earlier, this field of consciousness is not simply a product of intellectual exploration. Maharishi Vedic Science is based upon the understanding not only that a field of pure consciousness exists at the basis of life, but also that this field may be contacted by the human mind—the direct experience, within human awareness, of the innermost core of life. Maharishi Vedic Science provides technologies of consciousness—most fundamentally, the Transcendental Meditation and the TM-Sidhi programs—for the purpose of contacting the transcendental field of pure consciousness and integrating that experience into daily life so that not only individual life but national life may grow more coherent and fulfilling. The Transcendental Meditation technique is a simple, natural, effortless technique which allows the mind to transcend, or go beyond, more active levels of the thinking process and experience the source of thought—its own silent basis—the unbounded field of pure consciousness, Transcendental Consciousness, within. This process has been compared to a wave settling down to its basis in the ocean. Hundreds of scientific studies have demonstrated that, when people experience Transcendental Consciousness as a result of this transcending process regularly twice a day, they enjoy a wide range of benefits in daily life (Roth, 1994, pp. 4–5). For this reason, regular experience of pure consciousness is said by psychologists who have studied this state to “unfreeze” psychophysiological development” and to lead to permanent, higher levels of human development (Alexander & Langer, 1990, pp. 21–22).

Veda Is Structured in Consciousness

Let us begin by reviewing the significance of the term Veda, and its relationship to consciousness, in the context of Maharishi Vedic Science. Maharishi (1996b) explains that Veda means knowledge (p. 35). Knowledge is defined as the coming together of knower, knowing, and known. The experience of Transcendental Consciousness is the experience of consciousness knowing consciousness itself—the experience of knower, object of knowing, and known becoming unified—what Maharishi refers to as “pure knowledge.” Maharishi further defines Veda as the “structure of pure knowledge.” The experience of Transcendental Consciousness is the way to directly experience Veda, or

pure knowledge. It is this experience that serves to culture higher states of consciousness (Dillbeck, 1989, pp. 117–119).³

Many scholars indicate that the Veda is found in the ancient books of India. Maharishi, however, offers a more profound, and experience-based, understanding of Veda. Maharishi (Maharishi International University, 1974) begins by rejecting the more limited understandings of Veda:

Where is the Veda? In India? No. In the Himalayas? No. In any part of the world? No. In any phase of the finite? No. Then where should we look for the Veda? The Rig Veda itself answers the question of its location. It says:

ऋचो अक्षरे परमे व्योमन्

Ṛcho akshare parama vyoman

(Ṛk Veda 1.164.39)

The Ṛcha (hymns of the Veda) reside in the imperishable transcendental field—pure awareness, pure intelligence, pure consciousness. What, then, is the Veda? Is it the books of Sanskrit hymns? Here also, the answer is no. (p. 195)

In this quote, Maharishi explains that the Veda is not in any aspect of relative existence, including the “books of the Sanskrit hymns.” Although the term *Veda* has been applied to specific texts from the ancient Vedic tradition of India—for example, the texts of Ṛk Veda, Sāma Veda, Yajur Veda, and Atharva Veda—Maharishi establishes that Veda refers to more than merely the books of the Vedic tradition.

The reason why Veda cannot be found in a specific location or book, Maharishi explains, is that Veda in its true meaning—pure knowledge—is structured within consciousness itself; as Maharishi (1994) points out, “Veda means knowledge, pure knowledge, complete knowledge” and “Consciousness equates with Veda” (p. 3, p. 60). To explain this point more fully, Maharishi quotes, translates, and comments

³ The terminology and also the conventions of capitalization, italicization, and spelling used most frequently in quoted sources from Maharishi Vedic Science are followed in the text of this paper; there are some variations within quoted sources from different time periods.

upon what he calls the “master key verse” of Rk Veda. The first line of this verse, Rīcho Akshare Parame Vyoman, Maharishi has translated, as in the quote above, “The Rīchā (hymns of the Veda) reside in the imperishable transcendental field—pure awareness, pure intelligence, pure consciousness.” The central point is that Veda—the verses (Rīchā) of the Veda—exist within consciousness, within one’s own Self—the transcendental field of life (Parame Vyoman). This is among the most fundamental points of Maharishi’s teaching. Veda exists within consciousness and, therefore, through the technologies of Maharishi Vedic Science, Veda is accessible to human experience. The rest of the verse explains the implications and results of this experience of Veda. Let us consider the verse as a whole, in a translation by Maharishi (1997c), which incorporates an even more detailed understanding.

ऋचो अक्षरे परमे व्योमन्
 यस्मिन् देवा अधि विश्वे निषेदुः
 यस्तन्न वेद किमृचा करिष्यति
 य इत् तद् विदुस् त इमे समासते

*Rīcho Ak-kshare parame vyoman
 yasmin Devā adhi vishve nisheduh
 yastanna veda kim rīchā karishyati
 ya ittadvidus ta ime samāsate*

(Rk Veda 1.164.39)

The verses of the Veda exist in the collapse of fullness (the kshara of अ (A)) in the transcendental field in which reside all the Devas, the impulses of Creative Intelligence, the Laws of Nature responsible for the whole manifest universe. He whose awareness is not open to this field, what can the verses accomplish for him? Those who know this level of reality are established in evenness, wholeness of life. (pp. 52–53)

Over the course of time, Maharishi has translated and commented upon the Rīcho Akshare verse, exploring its significance in increasingly great detail, with a growing emphasis upon phonological analysis,

which sheds light upon deeper meanings of the verse. The first line, in the translation above, is: “The verses of the Veda exist in the collapse of fullness (the kshara of A).” Maharishi calls attention to the phonology of the words in this verse, which, by their very sound, suggest not only the surface meaning of the verse, but the subtle mechanics of the self-interaction of consciousness at the basis of the meaning. Akshara means imperishable. Breaking down this word according to the principles of Sanskrit grammar, we see that it represents the kshara, or collapse, of A. In analyzing the mechanics of consciousness, Maharishi (1994) has shown that the first sound within consciousness, due to its internal flow, is A—the expression of the total value of speech (pronunciation requires full opening of the mouth). When this sound “collapses” onto its own point value, the sound K—as it does in the first syllable of Rk Veda—the channels of speech are closed.⁴ Thus, as Maharishi explains (1994), the unbounded field collapses to the point value (pp. 354–355).⁵ As Maharishi (1994) explains in the quote below, in this collapse exist all the sounds of Veda and the Vedic literature.

The whole range of speech is in this collapse; all sounds are contained in this collapse, and all the mechanics of transformation of one sound into the other are also contained in this collapse.

The entire Rk Veda and its expanded version in the Vedic Literature—the holistic sound, अ (A), and all its quantified values (different syllables, alphabets, and the whole range of speech)—actually the entire dynamic field of the organizing power of pure knowledge is contained within this collapse, the Akkshar—the kshar of अक् (Ak)—the collapse of अक् (Ak). (pp. 354–355)

This translation uncovers the subtlest mechanics of the transcendental field of life. Ultimately, the entire Veda and Vedic literature, and the mechanics of transformation, are expressed within this field as a result of the self-interactions of this field, described here as the collapse

⁴The terms Rk and Rig are different transliterations of the same Sanskrit syllable. With the Sandhi rule of Sanskrit applied, the k in Rk becomes a g. R̥ and Ri are variant transliterations of a vowel sound that does not appear in the English alphabet.

⁵ Maharishi (1994) has called Vedic Science the “science of consciousness” (pp. 156–157); Maharishi (1991) has also called his Vedic Science the “science of speech.” The nature of consciousness, the structures of intelligence within consciousness, are sound. Therefore, the mechanics of consciousness are reflected in the precise nature of the Vedic sounds (1994, pp. 156–157).

of A onto K, the unbounded onto the point value. The mechanics of how that occurs is unfolded in phonological terms: the full-opening sound of A collapses onto its point value, the full closure sound of K. In this initial collapse, the “whole range of speech” is contained.

The second line points out that the transcendental field is the home of the laws of nature, which structure the universe. These laws of nature go by a variety of names—impulses of creative intelligence and Devas. Whichever name is applied, the role is the same: these are the impulses or laws “responsible for the whole manifest universe.” The third and fourth lines point out that contact with the transcendent level is essential to know Veda. Those who do not contact the transcendental level of reality do not experience the home of the Veda; therefore, what can the verses do for them? Those who know (directly experience) this transcendental level of reality, the field of Veda, are established in “evenness, wholeness of life.” Since Veda exists within consciousness, to experience Veda, one must experience the ultimate level of consciousness, that field which contains Veda in its fundamental value, that essence of life of which the Veda itself is made. It is for this reason that transcending to pure consciousness is understood to be the *sine qua non* of Vedic study, the essence of the study of Veda. Maharishi (1997a) explains:

The ground for Vedic Studies has been prepared by our experience of Transcendental Consciousness. Unless one has the experience of pure consciousness, the Veda, the totality of knowledge will not become a living reality. (p. 135)

The rest of this chapter and the next will serve as an elaboration upon this Rīcho Akshare verse, for all the significant seeds of Maharishi Vedic Science are contained within it. The following two sections will elaborate upon the fundamental point: Veda exists within consciousness.

The Self-Interacting Dynamics of Consciousness

Maharishi Vedic Science establishes not only the existence of a field of pure consciousness, of Veda, and its accessibility in human life, but also, as we have begun to see, the inner nature and mechanics of this field. At the basis of this analysis is the understanding of the most fundamental nature of this field: it is conscious, it is wakeful. Maharishi

describes it as a field of “pure wakefulness” as well as pure consciousness. Maharishi (1995b) explains the implications of a field that is conscious by nature.

Consciousness is that which is conscious of itself. Being conscious of itself, consciousness is the knower of itself. Being the knower of itself, consciousness is both the knower and known. Being both knower and known, consciousness is also the process of knowing. Thus consciousness has three qualities within its self-referral singularity—the qualities of knower, knowing, and known—the three qualities of ‘subject’ (knower), ‘object’ (known), and the relationship between the subject and object (process of knowing). (p. 19)

The field of pure consciousness thus gives rise to the qualities of knower, known, and process of knowing within its own unified structure, simply through the process of knowing itself, being conscious of itself. In a lecture inaugurating a World Assembly on Vedic Science, Maharishi (Maharishi Vedic University, 1986) explains the point even more simply.

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 intelligence, wide-awake in its own nature and completely self-referral. (p. 29)

The most fundamental nature of the field is that it is conscious, wakeful, aware. In that state, as consciousness alone, it has only itself to know. Consciousness is open to itself; consciousness knows itself. This is defined as a state of “self-referral” consciousness. Its structure is said to be a structure of three (knower, knowing, and known) in the nature of one (the unified wholeness of the field of consciousness itself). Therefore, Maharishi explains that it has a “three-in-one structure,” born of its nature as consciousness or intelligence. In the quote below, Maharishi (1994) introduces the Vedic terms for knower, knowing, and known—*Ṛishi*, *Devatā*, and *Chhandas*—and the term for the togetherness of the three, the one field of wholeness—*Samhitā*.

The three-in-one structure of *Samhitā* of *Ṛishi*, *Devatā*, and *Chhandas* is the nature of self-referral consciousness—Transcendental Consciousness. The intelligence quality of self-referral consciousness conceptually

creates the sequential emergence of three qualities—Ṛishi, Devatā, and Chhandas. (pp. 59, 308)

Note that the intelligence quality of this field “conceptually creates” the emergence of three qualities, knower, knowing, and known, or Ṛishi, Devatā, and Chhandas. Ṛishi, Devatā, and Chhandas are not separate and distinct from pure consciousness; they are merely conceptual—distinguishable by the intellect but still inseparably unified. Because this field of oneness, or singularity, is self-referral in nature, and because the self-referral nature allows the intellect to discriminate a three-in-one structure, the conceptual elements of this structure interact.

Maharishi explains the subsequent progression of states of interaction in various terms. For example, in one analytical approach, Maharishi explains that the three-in-one structure leads to an infinite contraction of three to one and infinite expansion of one to three, within this field. Because one and three coexist in this field, there is “infinite contraction” and “infinite expansion” simultaneously. Because of the infinite expansion and contraction, the state is said to be infinitely dynamic. Maharishi (1985) explains the phenomenon of infinite dynamism as follows:

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. (p. 65)

To summarize the sequence of logic: because consciousness is wakeful, it becomes aware of its own existence, thus creating an apparent division, a structure of three—knower, known, and process of knowing—within the field of unity. The separations between these constituent parts are understood to be apparent or conceptual separations, for each part—knower, known, and the process of knowing—is nothing other than pure consciousness. This conceptual division into three parts and the subsequent contraction and expansion between the one (of the unified state) and the three (of the diversified state of knower, known, and process of knowing), is the basis of its inherent dynamism. Consciousness is thus not flat and inert; it is unity, but the unity of

diversity—or dynamism. As Maharishi (1994) explains, “Thus, in its self-referral state, consciousness is the unified state of knower, knowing, and known” (p. 59). Maharishi (1994) further elaborates upon the nature and structure of the field; through the technologies Maharishi offers, this experience of self-referral consciousness becomes available:

Fully awake self-referral consciousness—pure *Saṃhitā*, togetherness of observer, observed, and observation—is the supreme realization of the Ultimate Reality. This is the basic field of Maharishi’s Science and Technology of Consciousness. This supreme reality of consciousness is fully available on both levels—experiential and intellectual. (p. 56)

Self-referral consciousness is the “supreme realization of the Ultimate Reality,” available both intellectually and experientially through Maharishi Vedic Science.

Quantum Physics and the Unified Field

From the standpoint of intellectual analysis, a theory of unity at the basis of the diverse creation has also intrigued many scientists. Einstein, for example, dreamed of finding a theory capable of uniting the various forces of nature. Within the past two decades, moreover, physicists in quantum field theory have succeeded where Einstein failed; they have identified and mathematically described a single, unified field at the basis of the physical universe. Dr. John Hagelin (1998), a leader in super unified quantum field theories based on the superstring, summarizes the recent discoveries of physics:

The culmination of this inward march of modern science has been the recent discovery of completely unified field theories. These theories, based on the “superstring,” identify a single, universal field of nature’s intelligence at the basis of all the forms and phenomena in the universe—a fountainhead of all known laws of nature. (p. 11)

Thus quantum physicists have, at least intellectually, established the existence of a “single, universal field of nature’s intelligence at the basis of creation” and explored the nature of this field. Some physicists have explored correlations between Maharishi’s detailed description of the structure and mechanics of the field of self-referral consciousness and the structure and mechanics of a “supersymmetric unified field” from quantum field theory. Dr. John Hagelin (1987) discusses the parallels in

structure between pure consciousness, as described by Maharishi Vedic Science and the unified field, as described by quantum field theory.

One of the most obvious and basic structural similarities between pure-consciousness and a supersymmetric unified field (i.e., a superfield or superstring field) is the “three-in-one” structure of pure consciousness, in which the observer, the observed, and the process of observation are unified (Maharishi Mahesh Yogi, 1985). A parallel structure is found within a supersymmetric theory, in which bose fields (e.g., force fields) and fermi fields (e.g., matter fields) are united through the agency of supersymmetry. Here, the bose fields may be compared to the intelligence or “observer” aspect of the unified field, the fermi fields can be compared to the material or “observed” aspect, and the “process of observation” can be found in the dynamical principle of gauge supersymmetry, which connects and unifies the two. From this perspective, the unified field or superfield itself corresponds to the *Samhitā* of Maharishi Vedic science. (p. 77)

In the analysis above, the basis of the unified field of physics into bose and fermi fields, connected through gauge supersymmetry, corresponds to the three-part structure of self-referral consciousness in Maharishi Vedic Science. Dr. Hagelin and other leading physicists have explored these and other parallels between quantum physics and Maharishi Vedic Science in some detail, and, in light of the parallels drawn, Maharishi has adopted the term unified field as an alternate referent for the field of pure consciousness, pure intelligence, or Being. These analyses suggest fundamental similarities between descriptions of the basis of life as viewed from very different traditions. However, as we have seen, Maharishi Vedic Science is not limited to the scope of modern science. While Maharishi Vedic Science makes use of modern methodologies of objective science, it also provides a subjective approach to knowledge that allows detailed exploration of the essence of subjective life—pure, self-referral consciousness—through direct experience. As a result, this body of knowledge, gleaned from the experiences and analyses of those experiencing the highest levels of human consciousness, includes an analysis of—and technologies for—the full range of experience open to human awareness, including the transcendent field of pure consciousness at the basis of life.

Self-Referral Consciousness: Its Infinite Dynamism Expressed as Sounds of the Veda and Vedic Literature

Maharishi Vedic Science describes the inner mechanics of self-referral consciousness in ever finer detail. We've seen that Maharishi describes an infinite dynamism created between the one and the three, the fundamental elements of this field. Elaborating upon this dynamism, Maharishi (1985) explains that sound emerges from this dynamism; as infinity pulsates, an unmanifest “noise” or “vibration” is created.

This infinite dynamism of the togetherness of three [Saṃhitā of Rishi, Devatā, Chhandas] creates its own noise. This noise is the noise in the unmanifest field, which is the unmanifest because it is open to itself—pure singularity but with three qualities, three and one both together. In this togetherness of one and three, we find infinity pulsating—infinity pulsating in that state of pure awareness where the awareness knows its unboundedness. Infinity, fully awake within 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 infinite dynamism of the self-referral nature of pure consciousness causes noise. It is completely an unmanifest noise, but noise nevertheless, just because its very nature is such that it is three and one together. This phenomenon is not open to anyone except itself. In this self-referral, self-interacting state we have noise, though noise is too crude a word. It creates vibrations within itself. (pp. 65–66)

Maharishi here introduces the terms point and infinity. Infinity is awake to its point value, and infinity is awake to its infinite value. The dynamism generated within the transcendent field of life, as a result of its structure as both three and one, or point and infinity, results in the phenomenon of vibration, unmanifest noise or sound. This sound, Maharishi goes on to explain, is the sound of the Veda and Vedic literature.

A Vedic term for the vibrations within the unified field is *Shruti*. *Shruti* means “that which is heard” (see quote below); these vibrations or sounds, however, are heard within the field of consciousness. As Maharishi (1994) explains this phenomenon, “Consciousness gets engaged in perceiving its own manifestations” (p. 318). Moreover, these “manifestations” are unmanifest sounds—*Shruti*—from which emerge the material particles, which constitute the manifest creation:

“Veda (*Shruti*) is structured in consciousness; sound is structured in consciousness; material particles are the materialization of the self-evolving, self-perpetuating, ever-wakeful structure of consciousness” (Maharishi Mahesh Yogi, 1995b, p. 23).

The implication here is that Veda emerges, and creation emerges, spontaneously, from the self-perpetuating structure of consciousness. In the following quote Maharishi (1995b) analyzes the mechanics of transformation within self-referral consciousness in greater detail:

The sound of the eternal process of transformation of singularity into diversity and diversity into singularity is heard by the fully awake consciousness within its self-referral structure—the Saṃhitā of Ṛishi, Devatā, Chhandas. This sound is called Shruti (that which is heard), the Vedic Sound, the sound of self-reverberating consciousness, the sound of intelligence in motion, which structures knowledge within consciousness (Saṃhitā of Ṛishi, Devatā, Chhandas—Ṛk Veda) and, in the natural momentum of sequential transformation, evolves into structures of sound presenting the form of sound—the alphabet (vowels, consonants), syllables, words, phrases, sentences (the sequential unfoldment of the verses of the Veda)—and this process of manifestation of the flow of sound in one continuous humming quality of sound, in one continuous sound, ॐ (A), continues to express itself as the quantified structures (or qualities) of the flow of speech; and further expressing more specific structures of speech, the same process, the same mechanics of transformation, continues to transform sound (frequency) into form, giving rise to particles of material creation; and this is how the process of transformation of consciousness continues, eternally expressing its more and more evolved stages. It is this continuum of evolution that we find expressed in the ever-expanding universe. (pp. 27–28)

In this quote, we are led through the unfolding of consciousness into matter in a step-by-step progression. First, the sound of the “transformation of singularity into diversity and diversity into singularity” is heard within self-referral consciousness. Then, this sound “structures knowledge within consciousness”—Ṛk Veda within consciousness—Ṛk Veda as the Saṃhitā of Ṛishi, Devatā, and Chhandas. From this sound of “self-reverberating consciousness” evolve the “structures of sound presenting the form of sound”—alphabet, syllables, words, phrases, sentences—the sequential unfoldment of the verses of Veda. Maharishi explains that this process of manifestation expresses first in

one continuous sound (A) and then into quantified structures (alphabet, syllables, etc.) of the flow of speech, then into more specific structures of speech (verses of the Veda). This process of transformation of consciousness continues to “transform sound (frequency) into form” giving rise, next, to particles of material creation and, finally, to the “ever-expanding universe.” In this connection, it is significant to note that in quantum mechanics, subatomic “particles” are understood to be fluctuations or vibrations, described by a wave function, rather than localized entities.

The Vedic sounds, the vibrations within consciousness, are heard by consciousness itself. These are *Shruti*, the sounds of Veda and Vedic literature. In the passage below, elaborating upon the nature of *Shruti*, Maharishi (1994) reveals the relationship of *Shruti* to Devatā, to self-referral consciousness, and to creative intelligence:

Shruti is the Devatā in the form of sound, the administrator of the universe in the form of sound—that which is totally heard—that which is heard for its specific tone without sacrificing its general, non-specific, holistic, absolute basis. It is specific and non-specific at the same time—it is specific, fully awake in its holistic quality, which is non-specific. It is the sound that is heard by itself; it is energy and intelligence at the same time, because its existence is on the level of self-referral consciousness. It is the specific representative of total creativity, total intelligence—it is *Chaitanya* [consciousness]: it is one with the absolute status of total organizing power, which is unshakeable, immutable, unimpeachable. It is the sound of the self-referral level of intelligence—self-referral level of consciousness—the scintillating light of creative intelligence heard as sound—*Shruti*. (pp. 356–357)

Here Maharishi discusses many features, and terms, pertaining to the Veda and Vedic literature in one comprehensive passage. *Shruti* is Devatā, “Devatā in the form of sound.” Devatā means the administrator of the universe.⁶ *Shruti* is heard in specific and non-specific tones simultaneously; it is both holistic and specific; as we will see, it is both simultaneous and sequential. It represents total creativity and intelli-

⁶ Note that this usage of the term Devatā is different from the usage in the exposition of the three parts of knowledge—Rishi, Devatā, and Chhandas. Here the term Devatā is used in the sense of “administrator of the universe,” as in the *Richo Akshare* verse. And here the term is equated with the sounds of Veda.

gence; it is energy and intelligence; it is consciousness. It is one with the total organizing power of life. It exists on the level of self-referential consciousness. It may be called the “scintillating light of creative intelligence heard as sound.” This is *Shruti*, the sound of Veda in consciousness.

This emphasis upon Vedic sound, the speech of the Veda, Maharishi (1991) explains as the essential nature of Vedic study: “Vedic study is the study of speech.” Maharishi explains this point in the following way: “The study of speech is the study of the process of manifestation of the *Ātmā*, the Self.” The term *Ātmān* (or *Ātmā*) is a term for the field of pure consciousness, which comes to be experienced as one’s own universal nature. The process of manifestation of pure consciousness Maharishi (1996a) has summarized in a simple expression: *Ātmā*, *Veda*, *Vishwa*: *Ātmā* (Consciousness, the Self), *Veda* (vibrations of consciousness knowing itself), then *Vishwa* (the entire universe emerging from those vibrations) (p. 377). *Ātmā* or pure consciousness is the source (and home) of *Veda*, the vibrations or sounds, which ultimately express in *Vishwa*, the universe, the material creation. Because the vibrations of consciousness arise spontaneously from the process of consciousness knowing itself, *Veda* is said to be self-generated, a naturally arising expression inherent in the nature of consciousness itself. Therefore, Maharishi (1995c) explains, *Veda* is both *Nitya*, eternal, and *Apaurush-eya*, uncreated or not man-made.

This is the reason why it is traditionally held that *Veda* is not created by anyone; *Veda* is *Apaurush-eya*—it is self-generated—it is created by itself; it moves within itself; it flows within itself; it stirs itself from within itself; and the beauty is that this move of WHOLENESS, and the resultant expressions of the holistic and specific values of natural law, is an all-time feature of the characteristic quality of the ocean of self-referral consciousness. This is the reason why the *Veda*, as it is expressed in terms of *Apaurush-eya*, is also expressed in terms of *Nitya*—eternal. So *Veda*, the total potential of natural law, the Constitution of the Universe, is eternal, self-sustained, self-created, uncreated by anyone; it is *Nitya Apaurush-eya*—eternal, self-created, uncreated *Veda*. (p. 304)

The Vedic sounds are the sounds of consciousness in motion, the vibrations existing within and made out of nothing other than consciousness itself—self-created and eternal. The sound is, therefore, Maharishi

(1995a) explains, unmanifest sound—heard by consciousness alone—the basis of Vedic literature.

Rk Veda, the self-generated sound of the self-interacting dynamics of the self-referral state of consciousness, is heard by itself—the creator or generator of sound hears itself in terms of sound.

It is this sound, the Unmanifest Sound—the sound quality of pure subjectivity—that is at the basis of all categories of sounds displayed in the Vedic Literature. (p. 166)

Clarifying this connection between Veda and Vedic literature in the context of “self-generated sound,” Maharishi (1995a) explains the relationship.

All the values of the Vedic Literature, which together structure the physiology of pure knowledge, the Veda, remain within the structure of Veda as its organizing power—the creative intelligence (*Brāhmaṇa*) lively within the structure (the Mantra aspect) of the Veda. (p. 170)

Maharishi describes the mechanics of consciousness in terms that may be challenging to comprehend intellectually. All the values of the Vedic literature structure the physiology of Veda; Vedic literature is the structuring dynamics of Veda. Vedic literature is the organizing power, or *Brāhmaṇa*, of the Veda; Veda is Mantra. Vedic literature remains “within the structure of Veda as its organizing power.” As the tree contains the seed, the seed gives rise to the tree; Vedic literature remains within Veda and structures the “physiology of pure knowledge, the Veda.”

Maharishi’s analysis of the self-referral dynamics of the field of consciousness and the steps of its evolution refines the understanding that diversity, including the human physiology, is the expression of the field of self-referral consciousness, the expression of Veda and Vedic literature. It serves to more fully explain Maharishi’s (1994) point that “The reality of the universe is one unbounded ocean of consciousness in motion” (p. 68).

Consciousness, Veda, the world. Maharishi Vedic Science reveals this sequence of the expression of life. If consciousness is the source

of vibration, which, in turn, is the source of creation, then consciousness is the source of all. In Maharishi Vedic Science, as we have seen, consciousness is understood to be not merely the source, but, in fact, the essential constituent of all. The world is but the play and display of the self-interacting dynamics of consciousness. The reality is “one unbounded ocean of consciousness in motion.” Therefore, to have knowledge of the self-referral nature of consciousness is to understand the source and essence of Veda and Vedic literature, and of the field of diversity or material creation.

Vedic Cognition

Maharishi explains the evolution of the outer sphere of life from consciousness through sound to material form. Now we will analyze the level of sound in greater detail. Let us consider first what it means to know, to have knowledge of something, particularly as it pertains to Vedic Science. In general, the term knowledge may refer either to intellectual understanding or direct experience; in its highest form in Maharishi Vedic Science, it indicates an integration of both. On the one hand, one may study a textbook about a great musical composition; or one may attend a performance of that composition and directly experience the music. On the one hand, one may think about a field of consciousness; or one may directly experience consciousness and its self-referral mechanics at the basis of nature—that is, to experience the structure of Veda. It is of some importance to note, as Dr. Michael Dillbeck (1989), Minister of Secondary Education of the Global Country of World Peace and expert in Maharishi Vedic Science, explains, that the term Veda (spelled Ved in the article quoted below) is used in the sense of both the underlying reality and the direct experience of that reality. [In the following quote, the terms individual psyche and cosmic psyche can be understood as individual intelligence and cosmic intelligence.]

Maharishi explains that the Ved is both the reality of the self-interacting dynamics of the unified field at the basis of the entire universe, and is also a state of experience that develops in human awareness as the individual psyche fully realizes its universal basis in the cosmic psyche. (p. 130)

Maharishi discusses in some detail the mechanics of coming to know the Veda through direct experience, and, in doing so, has further revealed the relationship between the books of the Veda and the direct experience of Veda. As we have seen, Veda exists in the field of Transcendental Consciousness, pure wakefulness: Maharishi (1990a) indicates that the experience of Transcendental Consciousness is therefore essential to knowing Veda.

You know the Veda by being Veda. You cognize Veda by being Veda. Cognition of the Veda is on its own level, and that is that level in which we get into the details of wakefulness. Veda is the detailed structure of pure wakefulness, and there the intellect does not go. (as cited in Sands, 1994, p. 104)

In this direct experience, or identity with Veda, “the detailed structure of pure wakefulness,” the intellect (human understanding) has no role. Intellect, in common usage, is understood to be the faculty of human awareness, which comprehends meaning. It is used in Maharishi Vedic Science to refer specifically to the faculty of discrimination. But, in terms of Vedic cognition, the intellect has no role: one knows the Veda by being Veda. When one has a sufficiently refined consciousness, Maharishi indicates, one becomes capable of appreciating within the simplest form of awareness the fine details of the interactions within this field, which are experienced as the unmanifest sounds and forms of the Veda and Vedic literature (Maharishi Vedic University, 1986, p. 497). Maharishi (1997b) quotes and translates a verse from Ṛk Veda to explain this phenomenon.

यो जागार तमृचः कामयन्ते

Yo jāgār tam ṛichah kāmāyante

(Ṛk Veda, 5.44.14)

He who is awake, the Vedic Hymns seek him out.

The Vedic Hymns, or expressions of Natural Law, are cognized in that state of consciousness which is fully awake within itself. This is the cognition of the full potential of Natural Law by itself on its own level. (v. 4, p. 30)

Note again that the “cognition of the full potential of Natural Law” is understood to be “by itself on its own level.” To appreciate the Vedic Hymns, one’s consciousness must be “fully awake within itself.” Transcendental Consciousness, which, as we have seen, is available through the Transcendental Meditation technique, is the basis of this wakefulness; this experience is the basis of becoming “awake” so that “Vedic Hymns seek him out.” When one’s nervous system is pure enough, the hymns or verses of the Veda, which exist within the transcendental field of pure, self-referral consciousness, “seek out” those of pure awareness, those who are “awake.” Maharishi indicates that when the nervous system is completely refined, one becomes able to experience the fine details of the self-interacting dynamics of one’s own inner Self, pure consciousness (Maharishi Vedic University, 1986). (The ellipses appear in the source for this quote and subsequent quote from the same source.)

This experience belongs to that supremely pure awareness which is fully cognizant of its own complete reality, on the level of all the five senses. That awareness is so pure that it knows its own self-referral value; only the self-referral value could notice these little ups and downs of its structure—*ag-ni-mīle* . . . ‘A’ collapsing to ‘G’ . . . this collapse takes place on a level where there is no distinction of alphabet. (p. 497)

Here Maharishi describes the cognition of Veda within consciousness. The example given in the quote is the example of the first four syllables of Ṛk Veda, *ag-ni-mī-le*, which are cognized within consciousness. Maharishi (1994) explains that the Vedic sounds, and the script of these sounds, constitute the deepest structure of inner intelligence (p. 312). This language unfolds eternally within transcendent, self-referral consciousness, and a very pure nervous system is capable of experiencing what Maharishi refers to above as “these little ups and downs” directly. Thus these sounds of the Vedic language, called by Maharishi the “language of nature,” are experienced within consciousness with such distinctness that they can be recreated on the surface level of life. Maharishi explains the phenomenon in this way:

The marvel of Vedic Science is that in the Vedic expressions—*agnim ile purohitam* . . .—the sound and the form are the same. The sound and the script, the words in sound and form—that is the hum at the unmani-

fest basis of creation, but that hum is so distinctly heard that one could imitate it in speech. (Maharishi Vedic University, 1986, pp. 496–497)

That the “words in sound and form” could be heard so distinctly that “one could imitate it in speech” is a significant point. This allows the Vedic sounds within consciousness to be brought out into the relative sphere of life. Maharishi cites as an example the first eight syllables of *R̥k Veda* in their distinct form: *agnim ile purohitam*. *Veda* expresses as “unmanifest sound,” occurring naturally within the structure of the field of pure consciousness, at the deepest level of every human being, an eternal reality of sound, both unmanifest and distinct. As we have seen, Maharishi indicates that “This experience belongs to that supremely pure awareness which is fully cognizant of its own complete reality” (Maharishi Vedic University, 1986, p. 497). The knowledge of the *Veda* is available in the world because of those pure nervous systems which have been able to cognize, as Maharishi (1985) indicates, the details of the inner structure of their own self-referral consciousness: such human beings, whether of ancient or modern times, are called Vedic seers: “We see the brilliance of Vedic seers demonstrating how clearly, through their stress-free nervous systems, they actualize in great precision all the details of the self-interacting unified field within their own transcendental consciousness” (p. 59). It is a supremely refined awareness that is capable not only of settling down to its unbounded basis, but also of perceiving its own expressions, enjoying the details of its own cosmic structure. In the following quote, Maharishi (1990b) describes the phenomenon of Vedic cognition in greater detail.

It is generated in the self-referral field of consciousness. On that level, those values of sound are there, and anyone can take one’s awareness to that settled state where one is open to oneself. And one would hear those sounds, one would see those sounds. (as cited in Sands, 1994, p. 97)

The Vedic texts, then, are simply written records of the direct experiences of *Veda* on the level of consciousness. The *Veda* exists within consciousness, but because it is open to direct experience with great distinctness, it can be recreated in speech. Because of the oral tradition of the Vedic sounds, built upon these cognitions, and because there has been a class of people—the Vedic pandits of India—who have carefully served as the custodians of this knowledge by memorizing the

sounds and passing them along from generation to generation, the Veda has been kept available to all generations.⁷ Maharishi (1980a) explains that the Veda becomes available through the direct experience of Vedic seers, after which the Veda is transmitted through the speech of Vedic pandits:⁸

When we analyze what the Veda is, we see that a book cannot be the Veda—pure knowledge cannot be a book. The unmanifest package of pure knowledge is a matter of experience in Transcendental Consciousness, and that is how it is revealed. From this experience, the Veda is expressed through speech, and so through speech, in the form we hear it from the pundit's mouth, the Veda is available to us. (p. 16)

Over time, such cognitions, preserved in oral traditions for generations, have eventually been recorded in written form. Thus there is a direct correlation between the sounds of the Veda in consciousness and the written records of those sounds in the Vedic texts—the books of Veda and Vedic literature. Nonetheless, Maharishi does make a distinction between the Vedic language, the reverberations in self-referral consciousness, and the Sanskrit language, the written expression of the Vedic vibrations:

The Vedic Expressions are the eternal, absolute, non-changing expressions of the mechanics of nature. These expressions are translated for their maximum value in the Sanskrit language, whose breath is derived from the Vedic Grammar. (1997a, v. 2, p. 110)

Maharishi (1995c) makes it clear that Vedic cognition is not the exclusive domain of the seers of old. The Vedic sounds, born of the self-interacting dynamics of consciousness, are available in one's own consciousness at any time.

This Unified Field of all the Laws of Nature (Saṃhitā of Ṛishi, Devatā, Chhandas—Ṛk Veda, which is structured in consciousness) is the field

⁷ The Vedic pandits were able to maintain for countless centuries the correct sounds in precise sequence through a series of intricate systems of memorization which served as cross-references for the Vedic texts. According to Dr. Thomas Egenes, "Thorough memorization allowed the verses of Sanskrit to be preserved accurately as an oral tradition." The texts were memorized in five traditional methods, or readings, called patha, in order to ensure perfect transmission of the sounds through time (Egenes, 2000, p. 46).

⁸ Note that there are variations in the transliteration of the word *pandit*; it is sometimes transliterated *pandit* and at other times *pundit*. The current convention is the earlier spelling.

of pure knowingness, pure intelligence—the infinite, eternal state of creative intelligence—the lively organizing power that is available to us as Shruti—vibrancy of intelligence in the form of sound generated by the self-referral dynamics of consciousness—those specific sounds that construct self-referral consciousness, which have been heard by the ancient Seers in their own self-referral consciousness and are available to anyone at any time in one’s own self-referral consciousness.

These sounds are the sounds that are available to us in the Veda and Vedic Literature. (pp. 271-272)

Since these sounds are the sounds of the self-referral dynamism of consciousness, they are available to anyone in one’s own self-referral consciousness. Maharishi (1995c) further points out the practical significance of these sounds for humanity: “Through proper use of these sounds, the entire Vedic Technology—the whole engineering of creation, all the secrets of nature’s silent functioning—is available to us” (p. 272).

Knowledge of these sounds, as well as their proper use, gives access to nature’s profound secrets, the engineering of creation. The technologies of Maharishi Vedic Science—being used for individual and collective benefit—involve such “proper use of these sounds” and knowledge of the Vedic Technology at their basis.

The Relationship of Name (Sound) and Form in the Language of Nature

A language born of the self-interacting dynamics of consciousness, the language of nature, the rise of which signifies the transformation of intelligence into matter, must possess unique qualities. Most significant among these, Maharishi explains, is the intimate relationship of sound and form, of unmanifest vibration and physical manifestation. As we have seen, Maharishi describes this unique relationship of sound and form in a simple way (Maharishi Vedic University, 1986): “The marvel of Vedic Science is that in the Vedic expressions—*agnim ĩle purohitam . . .*—the sound and the form are the same” (pp. 496–497). In another discussion, Maharishi (1971) speaks of the distinction between name and form:

The name is an impulse, and the form is a more solidified structure of that impulse. Therefore the name is the more delicate expression of the form, and the form is a more precipitated, more manifest value of the name. (as cited in Sands, 1994, p. 100)

We have seen that unmanifest sound emerges from the infinite dynamism—the vibrations that arise from the self-interacting mechanics of consciousness—and eventually emerges as the material particles that constitute the world of diversity—here, the “more precipitated, more manifest value of the name.” In a discussion which serves to elaborate this point, the unique features of sound and form in the Veda are brought out by Maharishi in terms of the relationship of pure knowledge and organizing power throughout the Veda and Vedic literature:

The intimate relationship of knowledge and organizing power is the specialty of the Vedic language, in which there is a perfect identity between the name and its corresponding form, the sound and the object. The projection of the Vedic syllables from that level where the “whisper of nature” is eternally going on spontaneously produces the form corresponding to the vibrations of the sound. (as cited in Dillbeck, 1989, pp. 132–143)

From this perspective, there is the “perfect identity” of the sound and the form: the same “whisper of nature” at the basis gives rise to both sound and form. As the sound arises, it “spontaneously produces” the form which corresponds to the sound. However, the relationship of sound and form is also described by Maharishi from a more sequential perspective, as we have seen in Section 2: “in the natural momentum of sequential transformation,” the Vedic sound, “evolves into structures of sound presenting the form of sound” and, subsequently, the particles of material creation and the ever-expanding universe. Maharishi (1996a) explains that the ultimate reality of consciousness is that everything is both sequential and simultaneous:

The universe is the expression of infinite diversity existing and evolving in the unbounded Unity—the ocean of self-referral consciousness. On this level of reality everything is self-referral; everything is automatic; everything is simultaneous; everything is sequential; everything is unmanifest. (p. 364)

From either perspective—whether sound is conceived of as the precursor of material creation, or whether sound is understood as “spontaneously producing the form” so that sound and form appear as a simultaneous reality—there is a “perfect identity” of sound and form.

Knowledge Has Organizing Power

Maharishi explains that the identity of sound and form is associated with the intimate relationship between knowledge and its organizing power. Maharishi at times uses a principle from Information Theory to explain the emergence of the Vedic sounds and the universe from self-referral consciousness: knowledge has organizing power. This means that more knowledge provides the organizing principle, and the power, for greater achievement. An architect’s knowledge allows him to design and create a bridge, for example. In terms of Maharishi Vedic Science, this principle is equally valid: Veda means knowledge, and Maharishi (1995a) indicates that the organizing power latent within Vedic sound gives a structure to sound, actually “formulates sound within the structure of self-referral consciousness.”

The sound of the Veda, *Shruti*, presents the structure of knowledge and organizing power present within the unmanifest field of self-referral consciousness, which formulates sound within the structure of self-referral consciousness, and further promotes sound into material creation. As the sound of the Veda (*Shruti* is the expression of self-referral consciousness, the organizing power latent within this (Vedic) sound, which gives a structure to sound, is located at its unmanifest basis on the self-referral level of consciousness. (p. 503)

The Vedic sound contains the organizing power responsible for its own emerging structure. The sound expresses within the unmanifest; the organizing power is likewise located within the “unmanifest basis of self-referral consciousness.”

Dr. Michael Dillbeck, in the article “Experience of the Ved,” explains this relationship of sound and form, of knowledge and its organizing power, in the Vedic language by comparisons with modern languages and with principles from quantum field theory. Dr. Dillbeck points out that in modern languages, the effect or organizing power of language comes from the meaning of words, from the transmission of information through meaning. In the Vedic language, however, the effect is

embodied directly in sound. To clarify the point, Dr. Dillbeck cites examples from physics—such as an experiment in which a bowstring is drawn across the edge of a steel plate. Moved by the vibrations in the plate, the sand sprinkled on top of the plate moves into a specific pattern called a “Chandli pattern.” The precise pattern is based upon the quality of the sound and the point of contact with the plate. This physical example illustrates the Vedic Science principle that sound and form are intimately correlated—that the sound or vibration expresses itself spontaneously as form—and that the organizing power for the form is contained within the sound (Dillbeck, 1989, pp. 134–135).

More significantly, in quantum field theory, subatomic particles have been identified not as specific, localized entities, but rather as unlocalized waves or vibrations described mathematically by a wave function. In Dr. Dillbeck’s words, “any material particle can be understood as the superposition of waves or vibration.” Thus, the vibration associated with a subatomic particle and the particle itself are one and the same. The vibration is the form; the vibration is the effect (Dillbeck, 1989, pp. 132–134). Similarly, according to Maharishi Vedic Science, the vibrational quality or sound of the Vedic language, as Dr. Dillbeck (1989) explains, is the source of its effect or organizing power.

The impulses of the Ved directly embody in their vibratory quality the organizing power of nature, the dynamics of the total potential of Natural Law. Maharishi identifies the Vedic sounds created by these dynamics as the fundamental flows of energy that structure all of creation. Inherent within the pattern of these vibrations, expressed as sounds, are the order and energy that express themselves in the fundamental forms of nature. (p. 134)

Maharishi explains that the first sound of R̥k Veda, A, embodies the wholeness of the knowledge embedded within the Veda and Vedic literature: the phonetic structure of this sound (the unrestricted openness of the mouth and throat that allow the sound “Ah” to be formed, as discussed earlier in this chapter), followed by the next sound K, embodies the mechanics of the self-interacting dynamics of consciousness. All subsequent syllables, verses, Maṇḍala of the Veda and, in fact, the human physiology and the entire physical universe, are elaborations of this sound, which is the seed of the entire expression of creation. This is an example, perhaps the most funda-

mental example, of the vibratory quality containing the organizing power of nature. The sound embodies the meaning, and the meaning, Maharishi (1997a) explains, lies in the effect of any given sound or sequence of sounds. “Every Vedic Sound or Name contains within it all the impulses that structure the qualities of the object or form to which it refers (v. 2, p. 96). More simply, Maharishi (1997a) says, “In the Vedic Language, sound and meaning are the same” (v. 2, p. 111). What emerges from the Vedic sound, as we have seen earlier, is the quantified structures of the sounds of the Veda, specific structures of sound which generate the material creation as a whole.

In exploring the unique qualities of the language of nature, we can see that the intimate relationship of sound and form is of special significance; it renders the language of practical value in human life. A number of technologies of Maharishi Vedic Science make use of this unique value of the Vedic sounds—for example, the Maharishi Yagya and Vedic Vibration technologies, both used as elements of Maharishi Vedic Approach to Health. Another is the program of recitation of Vedic literature. In this context, the sound value of the Vedic language is of major significance. Dr. Tony Nader (1995), in his groundbreaking book *Human Physiology: Expression of the Veda and the Vedic Literature*, explains the importance of sound in Veda and Vedic literature.

The term “sounds of Veda” refers to the sound value in the texts of Veda. A word has two aspects, sound and meaning. When one hears a foreign language, one hears the sound, but does not understand the meaning. (Some sounds don’t have any meaning in any language!) In Veda and the Vedic literature, the sound value of the Vedic chanting or recitation is given importance and not the meaning. (p. 1)

Dr. Nader (1995) elaborates upon this point: “It is in the sequential progression of sound and silence that the true meaning and content of Veda reside—not on the level of intellectual meanings ascribed in the various translations” (p. 34). These points clarify the emphasis in Maharishi Vedic Science on the vibrational quality of the Vedic language. The program of reciting Vedic literature is based primarily upon reading for vibrational effects or sound values. And, as we have seen, recitation for the frequency or sound value is based upon the understanding that the Vedic sounds are expressions of self-referral consciousness that form the blueprint of, and give rise to, the physi-

ology and the ever-expanding universe; further, these sounds are understood to create evolutionary effects for the individual and environment.

The Totality of Natural Law Is Veda: Consciousness Is the Home of All the Laws of Nature

Maharishi Vedic Science also unfolds a profound connection between the Vedic language and the laws of nature or natural law. First, we should clarify the terms “laws of nature” and “natural law,” as used in Maharishi Vedic Science. Dr. Tony Nader (1995) has explained these terms in a simple way:

The term “*laws of nature*” refers to all the laws of physics, biology, psychology, etc., including the laws which structure life at the individual and social levels, and which maintain order in the infinite diversity of the universe. The term “natural law” refers to the integrated, balanced, and holistic functioning of all the laws of nature. (p. 1)

If a law of nature, as studied in physics or biology, were true only upon occasion, it would not be classified as a law. Within certain conditions and circumstances, the description of nature must be able to be generalized; it must be predictable; it must have a non-changing element in order to be considered a law.

Maharishi (1980b) points out that the very nature of a law is that it is immutable and unchanging. The fact that a law of nature is considered to be a law suggests its origin in the unchanging sphere, defined in Maharishi Vedic Science as the transcendental field of pure consciousness:

The whole wisdom of scientific experimentation and derivation of truth is that when a fact is scientifically derived and found to be true, then it becomes a law. But the strength of the law, the value of it, and the practicality of it, are all because it has its seat in the non-changing field of life. (p. 78)

The “integrated, balanced, and holistic functioning” of natural law exists within the transcendental field of life. This field of natural law is the field from which the individual laws of nature emerge.

As we have seen, the Ṛicho Akshare verse indicates that the verses of the Veda exist in the transcendental field of life, the field of self-

referral consciousness, in which all the impulses of creative intelligence or the laws of nature, reside: pure consciousness is the home of all the laws of nature. As the quote above indicates, each law has its “seat in the non-changing field of life.” The holistic structure of natural law exists within consciousness, where the self-referral performance of consciousness generates Veda and Vedic literature, and the entire creation.

From self-referral consciousness, the unified state of the unmanifest Self, is the emergence of the laws of nature. Explaining this point more directly by quoting from Manu Smṛiti, Maharishi (1994) makes it clear that the Veda is actually made of eternal laws, in their totality:

वेदो अखिलो धर्ममूलम्

Vedo akhilo Dharmamūlam

(Manu Smṛiti, 2.6)

Veda is the root of all laws. (p. 207)

The totality of all laws is the Veda; or, expressed from another perspective, Veda is the “root of all laws.” Veda is referred to as a blueprint of creation, but Veda is not merely a description of the mechanics of intelligence in motion within itself; the self-interacting dynamics of consciousness generate Veda and therefore may be seen as the essence—the source of the laws which give rise to the infinite diversity of creation. Veda is the source of the order which expresses as laws of nature responsible for the entire creation.

Dr. Tony Nader (1995) explains the nature of the most fundamental level of creation: “This universal source of all orderliness has within itself all the diverse laws of nature governing life at every level of the manifest universe” (p. 1). Dr. Nader (1995) incorporates Maharishi’s description of the sounds of the Veda:

The sounds of Veda which have been recited generation after generation in the tradition of the Vedic families have been described by Maharishi as “the Laws of Nature murmuring to themselves. They are natural law describing itself and its own structure and function—eternally the same

total potential of natural law on that self-referral level of intelligence.”
(p. 1)

Note that in this quote the sounds of Veda are equated with natural law; they are “natural law describing itself and its own structure and function,” the “Laws of Nature murmuring to themselves.” In the quote that follows, Maharishi again points out the equation between the Vedic sounds, Shruti, and natural law in a passage which emphasizes individual access to this level of life:

The descriptions of Natural Law in Vedic Science are the actual Shruti—that which is heard when the mind identifies itself with this most fundamental level of nature’s functioning, the self-referral dynamics of Saṃhitā, which are cognized in the simplest form of human awareness (as cited in Dillbeck, 1989, p. 132).

Dr. Michael Dillbeck (1989) discusses this point further. The “descriptions of Natural Law” are the sounds themselves. Veda is itself the murmur of natural law, the holistic structure of the laws of nature within the unmanifest field of life, and therefore Veda contains its own organizing power: “According to Maharishi Vedic Science, the impulses of the Ved directly embody in their vibratory quality the organizing power of nature, the dynamics of the total potential of natural law” (p. 134). Thus it is that the practical benefit of transcending, of experiencing the Veda in self-referral consciousness, and also of reading the Vedic literature (recreating and thus enlivening the sounds of self-referral consciousness), is often described in terms of attunement with natural law. And the sequence of the unfoldment of these sounds is, Maharishi explains, the sequence of the unfoldment of natural law. The Veda is natural law.

Sequence in the Veda and Vedic Literature

When the self-interacting dynamics of consciousness express as the structure of the Veda, there is a specific sequence of unfoldment of sounds; for example, Ṛk Veda Saṃhitā begins with the sequence of sounds—*ag ni mi le pu ro hi tam*. This sequence is understood to be the specific, orderly sequence of natural law itself, the transformation of intelligence into sound, that sequence which, in its continued unfoldment and elaboration, unfolds into material particles, and, ulti-

mately, the human physiology as well as unfolding into all aspects of material creation. Maharishi has emphasized the perfect precision and perfect orderly sequence available in the arrangement of the Veda and Vedic literature. Like DNA, which embodies the vast intelligence of the human physiology in the specific sequence of its four fundamental molecular constituents, the intelligence of nature is embodied in a specific sequence of fundamental structures of sound.

The specific sequence of Vedic sounds, of natural law—the entire Veda and Vedic literature—is a sequential elaboration of the self-interacting dynamics of consciousness at the basis of creation. And sequence involves not just the sequence of sounds within any aspect of the Vedic literature, but the sequence of the various aspects of Veda and Vedic literature, which constitute the body of natural law. As Maharishi (1994) explains, “The sequence in which the different aspects of the Vedic literature emerge from R̥k Veda presents that perfect order which is at the basis of the eternal, absolute order in the universe” (p. 131). Maharishi (1994) has also expressed the point this way:

R̥k Veda is like the seed, and its sequential progression in terms of the different aspects of the Vedic Literature is like the evolution of the seed into the full blossoming of the flower, fruit, and tree. (p. 129)

The structure of Veda and Vedic literature in Maharishi Vedic Science reveals the flow of Veda from R̥k Veda, Sāma Veda, Yajur Veda, Atharva Veda, through self-referral loops—each loop consisting of six aspects of Vedic literature: the Vedāṅga, Upāṅga, UpaVeda (which comprises two loops of six aspects), Brāhmaṇa, and Prātishākhya. As we have seen, the restoration of the order and structure of the Vedic literature has been a significant contribution Maharishi has made to the re-enlivenment of Vedic knowledge. A passage from *Maharishi Vedic University: Introduction* clarifies the nature of this contribution.

Maharishi has systematized the Veda and Vedic literature and has presented them in a simple, integrated scientific structure, where everything is connected with everything else, and everything functions in perfect harmony with everything else. (1994, pp. 21-22)

The sequential structure of Veda and the Vedic literature is significant for the practical purpose of Maharishi Vedic Science; if outer

life is to be restructured according to its original and perfect design, then understanding the sequence of the blueprint of creation is of significance (Nader, 1995, p. 201). Maharishi indicates that it is because of the perfect order present in the Veda and Vedic literature that all aspects of the outer creation, including the human physiology, function with order and precision. The sequential flow from R̥k Veda through all aspects of Veda and Vedic literature Maharishi compares to the evolution of the seed to the tree.

Vedic Literature and Qualities of Consciousness

As consciousness interacts within itself, creating innumerable permutations and combinations, qualities of consciousness unfold. It is from the level of self-referral consciousness, Maharishi (1994) explains, that “Consciousness continues to generate qualities one after the other” (p. 318). And Maharishi (1994) discusses the correlation of each aspect of the Veda and Vedic literature with a particular mode and quality of consciousness: “Each aspect of Vedic Literature, from beginning to end, expresses the full range of a specific quality, from its infinite value to its point value—from its holistic value to its progressively quantified values in orderly sequence” (p. 74).

Maharishi indicates that each aspect of the Vedic literature is holistic, and that it also assumes “one predominant quality” as its specialty. We have seen that Veda, in its sequential nature, is unfolded as the specific progression of the Veda and Vedic literature; in this unfoldment, each aspect of the Veda and Vedic literature highlights a particular quality. These qualities within the unmanifest, embodied by the aspects of Veda and Vedic literature, are, Maharishi (1994) explains, the basis for the variety of qualities expressed in the manifest universe:

It is revealing to find that each aspect of the Vedic Literature presents essential qualities lively in the vacuum state of pure consciousness; and again it is revealing to find that different values of the universe are the expressions of specific qualities of consciousness displayed in different aspects of the Vedic Literature. (p. 128)

The infinite diversity of creation emerges from the variety of qualities of consciousness, which constitute the basis of life. In the reintegrated structure of the Veda and Vedic literature in Maharishi Vedic Sci-

ence, we can see Ṛk Veda as the holistic structure of Veda, followed by Sāma Veda, Yajur Veda, and Atharva Veda, which embody the holistic structure of Veda with reference to the Ṛishi, Devatā, Chhandas elements, and each of which embodies a particular quality of consciousness—flowing wakefulness, offering and creating, and reverberating wholeness. From the four values of Veda, the thirty-six values of intelligence, the Vedic literature, are unfolded, in six self-referral loops—the Vedāṅga, Upāṅga, UpaVeda (with two loops of six), Brāhmaṇa, and Prātishākhya; these are the loops or clusters of Vedic literature. The holistic source of all these qualities is the Ṛk Veda; as Maharishi (1994) explains, the Ṛk Veda contains all other qualities: “It is revealing to find that Ṛk Veda Saṃhitā is the expression of the unified state of consciousness, which is the sum total of all qualities of consciousness, or the sum total of all different values of intelligence” (p. 130). Thus, each expression of a specific quality of consciousness in the Vedic literature is a quality contained within Ṛk Veda, the holistic expression of pure knowledge: for example, Sthāpatya Veda expresses the establishing quality, Dhanur-Veda the invincible and progressive quality, Gandharva Veda the harmonizing and integrating quality, Shikshā the expressing quality, and so forth.

The qualities are, moreover, according to Dr. Nader (1995), symmetrical: one quality balances or neutralizes another. Dr. Nader points out that this description is similar to the supersymmetric balance of the unmanifest vacuum state identified in quantum field theory; the vacuum state is the most fundamental aspect of any given quantum field, in which all possible fluctuations of the field exist simultaneously, as if canceling each other out (p. 25). The Veda and Vedic literature sequence illustrates this principle through the unfoldment of qualities which cancel each other out or, in essence, neutralize each other. Dr. Nader (1995) explains this point as follows:

In the Vedic literature, for example, there is a part, which is responsible for expansion, called Vyākaraṇa. Expanding, however, like heating, has to be under proper control and balance to maintain wholeness. This is why the expanding value is followed by a self-referral value which is the feedback system that maintains the expansion in contact with the source. (p. 25)

In addition to the balance maintained through the unfolding of opposite qualities, the structure of the self-referral loops of Vedic literature reveals that the first three qualities of each loop of Vedic literature in effect emerge from *Ātmā*, from Unity, and unfold through Ṛishi, Devatā, and Chhandas into its diverse expressions, while the second set of three aspects of Vedic literature reveals the process which connects the unfoldment of qualities with its source, through the return path, or self-referral feedback loop, from Chhandas, Devatā, to Ṛishi and back to *Ātmā*, or Unity. In the case of the Vedāṅga, the first three qualities, Shikshā (Ṛishi)—expressing, Kalpa (Devatā)—transforming, and Vyākaraṇ (Chhandas)—expanding, reveal the unfolding of unity into diversity. The self-referral feedback loop is seen in the second line of Vedic literature constituting the Vedāṅga, Nirukta (Chhandas)—self-referral, Chhanda (Devatā)—measuring and quantifying, and, finally, Jyotish (Ṛishi)—all-knowingness, a progression which reflects the self-referral process—the return from diversity to unity (Nader, 1995, pp. 38–42). The chart of Maharishi’s organization of the aspects of Veda and Vedic literature sheds light on these relationships between different aspects of the Vedic literature while revealing the body of Veda and Vedic literature as an integrated whole.

It is interesting to note that the qualities of the Vedic literature reflect the internal dynamics of the unmanifest field of life and are, therefore, when taken together, still unmanifest in nature. These qualities, in reality, are beyond space and time and coexist simultaneously. As Dr. Nader (1995) points out, “The reality is that simultaneity is always operating. It can only be this way if total balance is to be maintained at all times” (p. 40). This leads to the conclusion that Veda and Vedic literature, while analyzed in terms of a precise, sequential unfoldment within consciousness, are, in reality, eternal and non-changing—simultaneous realities—within consciousness, within the gap into which each syllable of Veda dissolves and out of which the following specific syllable emerges. Thus, as Dr. Nader (1995) points out, “simultaneity is always operating.” And thus all qualities of consciousness, the Veda and Vedic literature, simultaneously coexist within the unmanifest level of life (p. 40). Maharishi (1994) explains this point further in the following quote: “All aspects of the Vedic Literature, in the process of structuring Veda, function together simultaneously; so

the structure of Veda is structured by those dynamics whose dynamism is always self-referral” (pp. 75–76). We have seen that the different aspects of the Vedic literature, the different qualities of consciousness, comprise Rk Veda. In speaking of the Vedic literature as the “structuring mechanics” (or dynamics) of Veda, Maharishi (1994) again suggests the simultaneity of Veda and Vedic literature:

The sounds of these fluctuations of consciousness (syllables, words, etc.) are the structuring mechanics—different qualities of consciousness that together constitute the structure of Rk Veda, and give expression to the non-expressed, self-referral state of consciousness. (p. 327)

Although understanding of the underlying nature of consciousness—and its structure in Veda and Vedic literature—is enhanced by reviewing the qualities of Vedic literature and the relationships of these qualities to wholeness and to each other, Dr. Nader (1995) brings out a fundamental point: “Speaking about the components of the Absolute is only a conceptual intellectual exercise. The reality of the Absolute remains oneness, singularity, unity” (p. 40).

The Uncreated Commentary of the Veda

Another significant feature of Veda in Maharishi Vedic Science, a feature of importance to the program of reading Vedic literature, is the understanding that Veda provides its own commentary. This principle explains why, in the reading Vedic literature program, no commentaries are included. As we have seen, Veda is known through direct experience of self-referral consciousness: only the Veda can know Veda; only an awareness established in the unified basis of life is capable of knowing the reality of Veda, which is structured in pure consciousness itself. This leads to one of the original and profound contributions of Maharishi (1995b) to Vedic understanding: the insight into Veda as its own uncreated commentary, or *Apaurusheya Bhāshya*. “According to Maharishi’s *Apaurusheya Bhāshya*, the structure of the Veda provides its own commentary—a commentary which is contained in the sequential unfoldment of the Veda itself in its various stages of expression” (p. 103).

The Veda is understood to be its own commentary; each successive stage of unfoldment of Vedic sound is an elaboration and commentary

upon the previous sound or syllable (*Swara*), line (*Pāda*), verse (*Ṛichā*), or hymn (*Sūkta*) of Veda. For example, Maharishi has shown that the totality of Veda is contained in the first syllable, *Ak*, which “contains the total dynamics of consciousness knowing itself,” and then in the first *Pāda* (phrase of 8 syllables); the first *Pāda* is understood to emerge from and provide a commentary upon Ṛk. The first verse or *Ṛichā* provides a further commentary upon the first *Pāda*. The next eight *Ṛichā* complete the first *Sūkta*, or hymn, which is the next stage of unfoldment. The 192 syllables of the first *Sūkta* are elaborated in the 192 *Sūkta* that make up the first Maṇḍala of Ṛk Veda. Maharishi (1995b) thus reveals an evolutionary structure of the Veda in sequentially evolving structures, which serve as an elaboration and commentary upon previous stages of development (pp. 367-372).

Another unique feature of Maharishi’s *Apaurusheya Bhāṣya* is his analysis of the significance of not only the sounds, but also the gaps, in the structure of Veda. In analyzing the phonetic structure of Veda, Maharishi (1996a) points out that the gap between any two sounds or words or lines, verses, or books has a detailed structure that reveals the mechanics of the progression of Vedic sound: “In my commentary on Ṛk Veda, *Apaurusheya Bhāṣya*, the gaps between syllables, words, *Ṛichā*, *Sūkta*, and *Maṇḍala* have four qualities—*Pradhwamsābhāva*, *Atyantābhāva*, *Anyonyābhāva*, and *Prāgabhāva*” (p. 540). First the previous sound (word, etc.) dissolves or collapses into the gap; this is the stage of *Pradhwamsābhāva*. Next is the step of absolute abstraction, complete silence, or *Atyantābhāva*. Within *Atyantābhāva*, pure consciousness, however, exists the self-interacting dynamics of consciousness, the seed of all dynamism, the structuring dynamics of the gap, called *Anyonyābhāva*: As Maharishi (1996a) explains, “*Anyonyābhāva* is the infinite dynamism which relates the previous and consecutive values in the process of transformation taking place in the gap” (p. 541). From *Anyonyābhāva*, the final stage occurs, *Prāgabhāva*, which is the mechanics by which a syllable, or sound, of Veda and Vedic literature emerges from the gap (Nader, 1995, p. 34). In the following quote, Maharishi (1997c) discusses the gap as the home of the structuring dynamics of the sounds of Veda and, therefore, the “very breath” of the four Vedas.

These four qualities of the unmanifest, silent field of consciousness—the structuring dynamics of the sounds of the Veda within the GAPS between the sounds—are the very breath of the four Veda, the self-reverberating breath of the Veda—Ṛk Veda, Sāma Veda, Yajur Veda, and Atharva Veda. The structuring dynamics of these four Veda, functioning together within each GAP, are the self-evolving structures of the whole creation.

This is how we see the structure of consciousness, the absolute structure of Law—Veda—as the creator of its own structure, involved in the creation and evolution of its own Self. (p. 12)

The Veda generates its own structure within its own Self, through the gaps between each sound. The structure of the gap has four constituent parts.⁹ Maharishi's *Apaurusheya Bhāṣya* serves to elucidate the nature and dynamical structure of the self-generated progression of the Veda and Vedic literature. The understanding of the fourfold nature of the gap—into which sounds collapse into silence and out of which, due to its inner dynamism, sounds emerge in sequential progression—is expounded by Dr. Nader (1995), further clarifying the inner mechanics of the emergence of Veda and Vedic literature within pure consciousness, which is always self-referral in every phase of expression.

This is how Ṛk Veda and the whole Vedic literature emerge within the pure Self, Ātmā, in its self-referral quality, expressing, transforming, expanding, silence and dynamism, sounds and the gaps between sounds; always coming back to the source via the loops at the basis of the structuring dynamics of pure knowingness. (p. 42)

“Always coming back to the source” is the essence of how the Veda and Vedic literature emerge within the Self, pure consciousness. This quote also points to the emergence from gaps into sound and then gap, and also the structure of the Vedic literature into loops, as features of the self-referral nature of Vedic literature. This principle of self-referral unfoldment of Veda explains further how the Veda is its own commentary and, therefore, does not require commentaries created by

⁹ Note that in more recent publications, Maharishi tends to transliterate these terms by eliminating the Sanskrit *sandhi* principle which connects the words together: *Pradhwamsābbhāva* becomes *Pradhwamsa-Abbāva*, *Atyantābbhāva* becomes *Atyanta-Abbāva*, *Anyonyābbhāva* becomes *Anyonya-Abbāva*, *Prāgabbhāva* becomes *Prāg-Abbāva*.

Vedic scholars. Only the Veda, Maharishi (1997c) explains, can elaborate upon its nature: “It [*Apaurusheya Bhāshya*] explains the evolution of Natural Law, which from within itself generates diversity from Unity” (p. 149). Maharishi elaborates upon this point as follows:

Let us examine the mechanics through which Vedic Technology, in the unmanifest GAPS, gives rise to manifest structures; how, by virtue of Vedic Technology, the unmanifest manifests; how, from the empty space (GAPS in the structure of Veda), Veda is created, which in turn creates everything in the universe. (p. 149)

Another significant feature of the gap between sounds is that the gap contains the memory of the sequence of the totality of Vedic sounds. Therefore, the gap is understood to contain the entire Veda and Vedic literature.

The significance of this principle of the emergence of sound from gap, of the Veda and Vedic literature within the gap—the precursors of material creation in their totality within every gap—extends to the possibilities it suggests for human life. From the most profound level of one’s consciousness, the infinite source of creativity becomes available to humankind. Maharishi (1997c) expresses this point, in a summary of the *Apaurusheya Bhāshya*, in the following quote:

Maharishi’s *Apaurusheya Bhāshya* offers the formula to create anything from nothing—to create anything from the empty space (*Parame Vyoman*) of one’s own self-referral consciousness. (p. 149)

The gap is available in one’s own self-referral consciousness. Contact with this transcendental field of life (*Parame Vyoman*) is the basis of full creativity in life.

The Discovery of Veda in the Human Physiology

Another significant aspect of Maharishi Vedic Science we may consider is the relationship between Vedic literature and the human physiology. Maharishi (1994) refers to the Vedic literature as the “structuring dynamics” of both the Veda and the human physiology “The entire Vedic Literature has been discovered as the structuring dynamics of Ṛk Veda on one side and the structuring dynamics of the human physiology on the other side” (p. 106).

The relationship between the intelligence and orderliness within Veda and the Vedic literature and the intelligence and orderliness expressed in the human physiology has been researched extensively by Dr. Tony Nader, and recorded in *Human Physiology: Expression of the Veda and Vedic Literature*. As Dr. Nader (1995) expresses this idea, “The perfect order expressed in the universe and displayed in the human physiology is the expression of the perfect order present within Veda” (p. 18).

The correlations between the Veda and the human physiology are understood to exist on many levels. Under Maharishi’s guidance, Dr. Nader (1995) has explored the basis of the correspondences between anatomical structures and Vedic sounds:

The structure of the various branches of Veda and the Vedic literature correspond to specific structures in the physiology. These anatomical structures therefore have the same intelligence at their basis as that intelligence which structures the Vedic sounds to which they correspond. (p. 200)

Dr. Nader has brought out in detail a profound and detailed understanding of Veda and Vedic literature in its relationship to the human physiology. Veda and Vedic literature are not merely verses and chapters in ancient tomes of Vedic wisdom, as we have seen. Veda and Vedic literature are pure intelligence itself, vibrating at the subtlest levels of creation, bringing order to every level, including physical expressions—in particular the human nervous system. The Veda and Vedic literature are the vibrating intelligence within the human physiology and thus a universal and living reality. In summarizing the significance of this point, Maharishi (1994) explains that the Veda and Vedic literature are the organizing power of natural law, lively within the entire physiology of everyone (p. 151).

Correlations between specific aspects of Veda and Vedic literature and specific aspects of the human physiology have been explored in some detail. Dr. Nader and his colleagues, under Maharishi’s guidance, have investigated the fine levels of structure and function of various aspects of the human physiology and their correlations with the structure and function of Veda and the Vedic literature. In his analysis, for example, Yoga, a central aspect of the Vedic literature—which includes the technologies for transcending, for allowing the

conscious mind to settle down and identify with its unified basis in Transcendental Consciousness, and for culturing the ability to function from that level so that the individual mind and its transcendental basis are permanently unified—is equated with the unifying quality of consciousness. Yoga is that aspect of Vedic literature which, Dr. Nader explains, “brings out the quality of unity and hides or covers diversity.” In the physiology, Yoga “unifies differences” and “allows opposite values to be integrated and form a meaningful whole.” Dr. Nader (1995) explains that Yoga is, therefore, associated, in physiological terms, with the association fibers of the cerebral cortex:

We live in a diversified universe. Our senses are constantly bombarded by millions of inputs and our physiology constantly performs millions of tasks to maintain its balance, integrity, and evolution. The conscious comprehension of this diversified complexity and the integration of differences occur through the unifying value of the association fibers of the cerebral cortex. (p. 144)

Subsequently, Dr. Nader (1995) traces the similarities in function between the association fibers of the cerebral cortex and Yoga in greater detail. He shows that the structures of association fibers and of Yoga are similar: the four lobes of the cerebral cortex correspond to the four chapters of Yoga; the last verse of Chapter One corresponds to the occipito-occipital corpus callosum, which unifies the right and left occipital lobes; the total number of association fibers can be divided into 195 sets, which correspond to the 195 *Sūtra* of Yoga. Dr. Nader goes on, in this case, to show how the length of each *Sūtra* corresponds to the dimensions of the brain gyri related to that *Sūtra*: “For example, in Chapter one, *Sūtra* 1, 2, 3, 4, and 23 are short, and they occupy a short fold on the gyri of the brain. *Sūtra* 14, 15, 24, 30, and 41 are long, and they occupy a long fold on the gyri of the brain” (p. 145).

We can see that, in this instance, parallels are indicated in structure and function of Yoga and the association fibers of the brain on many levels: the function of Yoga and association fibers as a whole, the divisions of association fibers and divisions of the book into chapters, the correlations between structure and function of specific verses of Yoga with specific fibers in the brain, the correlation between numbers of sets of fibers and numbers of *Sūtra*, and even correlations between the lengths

of specific folds in the brain with the lengths of the sequences of specific verses from Yoga Sūtra (1995, pp. 144–145)

Significantly, one conclusion Dr. Nader (1995) draws from these correlations pertains to the function of reading Vedic literature: the process is nourishing and revitalizing—strengthening the association fibers—and neutralizes physiological imbalances.

We conclude that the repetition of the *Sūtras* will neutralize irregularities or imbalances in the physiology. Reading the Yoga Sūtras is nourishing and revitalizing. It is an exercise that maintains the vitality and strength of the structure and function of the association fibers, and leads to the integration of mind and body, of understanding and action. Integrated understanding, an integrated decision-making process, and integrated action means mistake-free action in accordance with natural law. (p. 145)

Here it is suggested that reading a particular aspect of Vedic literature will maintain the “vitality and strength of the structure and function” of the corresponding aspect of the physiology (in this case, the cortical association fibers) and thereby will enhance integration of mind and body, understanding and action. The correlations between Vedic literature and human physiology, therefore, play a role in the program of reading Vedic literature. They also play a role in other technologies of Maharishi Vedic Science.

The basis of these correlations is the self-interacting dynamics of consciousness. Because of the dynamism of self-referral consciousness, consciousness expresses as Veda and then the physical creation, including the human physiology. Therefore, Dr. Nader indicates, the human physiology is lively with Veda, the total potential of natural law, in its structure and function. A significant outcome of this correlation between Veda and physiology, Dr. Nader (1995) points out, is the unique ability of human life to know itself as Veda:

The human physiology has the ability to know itself and experience pure consciousness (*Ātmā*, the unified field) because, as will be shown in the following chapters, it has the same structure as Veda. The human physiology is Veda. This is how Veda knows itself, hears itself, touches itself, sees itself, tastes itself, and smells itself. It is through that self-referral state that the human physiology, or Veda, is able to manage all its structures in all the fields of senses and action. (p. 16)

As Dr. Nader indicates, the human physiology could be understood as Veda's way of knowing itself, of experiencing its own nature in both infinite and point values. The Veda "knows itself, hears itself, tastes itself, and smells itself" through the human physiology. And through the self-referral state of consciousness, the human physiology is able "to manage all its structures in all the fields of senses and action." Thus do the correlations of Veda and physiology lie at the basis of the technologies of Maharishi Vedic Science, which serve to manage the structures for maximum potential of life. The profound relationship of Veda and the human physiology is the basis for the possibility of the experience of pure consciousness, and therefore, of enlightened life, of individual life encompassing the underlying unity of all existence—Brahman, the totality.

Thus it follows that, as Maharishi (1994) points out, Dr. Nader's discovery renders the importance of reading the Vedic literature obvious: "The importance of reading the Vedic literature is very obvious in view of the recent discovery of the Veda and Vedic literature in the human physiology" (pp. 183–184). As we will see in subsequent chapters, enlivening Veda and Vedic literature in consciousness, physiology, and environment is understood as an integral part of the highest level of enlightenment. As Dr. Nader (1995) explains, "Anyone not living perfection in life can attain the high dignity of life for which his physiology was originally constructed by practicing the Maharishi Transcendental Meditation and TM-Sidhi programs and reading the Vedic literature" (p. 201).

Practical Aspect of *Maharishi Vedic Science*:

Contact with the Field of Pure Consciousness or *Ātmā*

As mentioned earlier, Maharishi offers practical technologies for culturing the nervous system to sustain enlightenment. The fundamental technologies of Maharishi Vedic Science, the Transcendental Meditation and TM-Sidhi programs, allow one to experience one's innermost nature, Transcendental Consciousness, which is experienced as one's own Self—in Sanskrit terminology, *Ātmā*—and ultimately to experience the unfoldment of one's full potential in life. The goals of Maharishi Vedic Science are, most fundamentally, higher states of consciousness for the individual and higher collective consciousness for the

world. These technologies and the goals of these programs—higher states of consciousness—have been validated through extensive scientific research. A subsequent article explores the definitions, explanations, and scientific research validating the growth of higher states of consciousness as well as new technologies, programs, and organizational structures for the upliftment of human life on earth.

References

- Alexander, C. N.; Langer, E. J.; Newman, R. I.; Chandler, H. M.; & Davies, J. L. (1989). Transcendental Meditation, mindfulness, and longevity: An experimental study with the elderly. Summary of paper in the *Journal of Personality and Social Psychology*, 57(6), 950–964.
- Chandler, K. (1987). Modern science and Vedic Science: an introduction. *Modern Science and Vedic Science*, 1(1), 5–26.
- Dillbeck, M. C. (1989). Experience of the Ved—Realization of the Cosmic Psyche by Direct Perception: Opening Individual Awareness to the Self-interacting Dynamics of Consciousness. *Modern Science and Vedic Science*, 3(2), 117–152.
- Egenes, T. (2000). *Introduction to Sanskrit: Part Two*. Delhi: Motilal Banarsidass Publishers.
- Hagelin, J. (1987). Is Consciousness the Unified Field?: A Field Theorist's Perspective. *Modern Science and Vedic Science*, 1(1), 28–87.
- Hagelin, J. (1998). *Manual for a Perfect Government: How to Harness the Laws of Nature to Bring Maximum Success to Governmental Administration*. Fairfield, Iowa: Maharishi University of Management Press.
- Maharishi International University. (1974). *Maharishi International University Catalogue 1974/1975*. Los Angeles, CA: Maharishi International University Press.
- Maharishi Mahesh Yogi. (1971). *Relationship between name and form in the Veda*. [Videotaped lecture, 12 August 1971, Arcata, CA].
- Maharishi Mahesh Yogi. (1980a). Keynote address. In *Science, Consciousness, and Ageing: Proceedings of the international conference*, (pp. 9–21). Rheinweiler, West Germany: Maharishi European Research University Press.

- Maharishi Mahesh Yogi. (1980b). The structure of pure knowledge. In *Science, Consciousness, and Ageing: Proceedings of the international conference*, (pp. 73–80). Rheinweiler, West Germany: Maharishi European Research University Press.
- Maharishi Mahesh Yogi. (1985). In *Maharishi Mahesh Yogi: Vedic University inauguration*. Washington, DC: Age of Enlightenment Press.
- Maharishi Mahesh Yogi. (1986). *Life supported by Natural Law*. Washington, DC: Age of Enlightenment Press.
- Maharishi Mahesh Yogi. (1990a). *Guru Purnimah*. [Videotaped lecture, July 1990, Vlodrop, Holland].
- Maharishi Mahesh Yogi (1990b). *Primordial sound and the mechanics of creation*. [Videotaped lecture, 21 March, 1990].
- Maharishi Mahesh Yogi. (1991). *The unbounded scope of Maharishi Vedic Science*. [Videotaped lecture, 14 January, 1991, Maastricht, Holland].
- Maharishi Mahesh Yogi (1994). *Maharishi Vedic University: Introduction*. Vlodrop, Netherlands: Maharishi Vedic University Press.
- Maharishi Mahesh Yogi. (1995a). *Maharishi's Absolute Theory of Government: Automation in administration*. India: Maharishi Prakashan.
- Maharishi Mahesh Yogi. (1995b). *Maharishi forum of natural law and national law for doctors*. India: Age of Enlightenment Publications.
- Maharishi Mahesh Yogi. (1995c). *Maharishi University of Management: Wholeness on the move*. India: Age of Enlightenment Publications.
- Maharishi Mahesh Yogi. (1995d). *The science of Being and art of living*. New York, New York: Penguin Books USA Inc.
- Maharishi Mahesh Yogi. (1996a). *Maharishi's Absolute Theory of Defence: Sovereignty in invincibility*. India: Age of Enlightenment Publications.
- Maharishi Mahesh Yogi. (1996b). *Inaugurating Maharishi Vedic University*. India: Age of Enlightenment Publications.
- Maharishi Mahesh Yogi. (1997a). *Maharishi speaks to educators: Mastery over natural law*. India: Age of Enlightenment Publications.
- Maharishi Mahesh Yogi. (1997b). *Maharishi speaks to students: Mastery over natural law*. India: Age of Enlightenment Publications.

- Maharishi Mahesh Yogi. (1997c). *Celebrating perfection in education: Dawn of Total Knowledge*. India: Maharishi Vedic University Press.
- Maharishi Vedic University. (1986). *His Holiness Maharishi Mahesh Yogi: Thirty years around the world—Dawn of the Age of Enlightenment, Vol. 1, 1957–1964*. Vloderp, Netherlands: Maharishi Vedic University Press.
- Nader, T., M.D., Ph.D. (1995). *Human physiology: Expression of Veda and the Vedic Literature*. Vloderp, The Netherlands: Maharishi Vedic University.
- Nader, T., M.D., Ph.D. (2000). *Human physiology: Expression of Veda and the Vedic Literature (4th ed.)*. Vloderp, The Netherlands: Maharishi Vedic University.
- Roth, R. (1994). *Maharishi Mahesh Yogi's Transcendental Meditation*. New York: Donald Fine, Inc.
- Sands, W. F. "Maharishi's Absolute Theory of Government in the Vālmiki Rāmāyaṇa." Diss. Maharishi International University, 1994.
- Shearer, A. & Russell, P. (1978). *The Upanishads*. New York: Harper Colophon Books.

This article, "Fundamental Principles of Maharishi Vedic Science," by Patricia Oates, Ph.D., here revised/updated, and reprinted with permission, was accepted as part of her dissertation for a Ph.D. in Maharishi Vedic Science at Maharishi University of Management.

Section II



Maharishi Vedic Science: Application

Dharma in the Vālmīki Rāmāyaṇ
In the Light of *Maharishi Vedic Science and Technology*



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ABOUT THE AUTHOR

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ABSTRACT

This paper examines verses on Dharma from the Vālmiki Rāmāyaṇ, in the light of Maharishi Vedic Science and Technology. Although modern scholars generally hold Dharma to be the collective mores of the ancient Indian social structure, we find that the Rāmāyaṇ describes Dharma as the total potential of natural law, which includes the innumerable laws of nature that promote individual and social progress. Furthermore, the Rāmāyaṇ supports Maharishi's teaching that life in accord with natural law is attained through the unfoldment of the total potential of human life. This paper also shows how the Rāmāyaṇ depicts its central hero, Rām, as the embodiment of Dharma, supporting and upholding the progress of every aspect of the universe from the transcendental level. The Administration of Rām thus portrays an ideal civilization, in which every citizen lives a fulfilled and prosperous life in full accord with all the natural law. This ideal life is available to every society through the technologies of Maharishi Vedic Science.

Introduction

Over the past 38 years His Holiness Maharishi Mahesh Yogi has reformulated the ancient Vedic wisdom of life into a complete science of consciousness, his Vedic Science and Technology. In doing so, Maharishi has demonstrated that the literature of the Vedic Tradition is not the work of different authors in various historical periods; rather it is the precise description of the unified source of nature's orderliness, a self-interacting field of pure consciousness—pure wakefulness—that is the managing intelligence of the universe. Maharishi describes this field as the most fundamental level of natural law, for all the diverse laws of nature that give rise to and structure the vast material universe find their home within this unified field of intelligence. In addition, Maharishi brought to light practical procedures from the Vedic Tradition that enable anyone to directly experience and unfold this most fundamental and powerful level of natural law in their own awareness. This he explains as the ultimate achievement, the blossoming of the total potential of human life in higher states of consciousness.

Maharishi's comments on the Vedic literature, both in his writing as well as in many thousands of hours of lectures, have provided scholars and students with profound insights into the Vedic literature as the theoretical and practical textbooks of consciousness. While Maharishi

has not commented upon every verse and *Sūtra* in this vast body of literature, he nonetheless has provided sufficient understanding of its pervading themes. This paper will illustrate how Maharishi's comments on the Vedic literature and his exposition of natural law can be used to show how the Vālmīki Rāmāyaṇ¹ unfolds one of its key themes, the nature and practical application of *Dharma*.

Dharma is a concept of singular importance throughout the Rāmāyaṇ, for virtually all behavior within the narrative is evaluated in terms of conformity or lack of conformity to it. Modern scholars view *Dharma* as a collection of loosely codified behavioral codes deeply rooted in the culture of ancient India and handed down from generation to generation. Maharishi, however, provides a more profound understanding in his commentary on another aspect of the Vedic literature, the Bhagavad-Gītā. In Maharishi's commentary, *Dharma* on its most fundamental level is the total potential of natural law, the managing intelligence of the entire universe; on a more expressed level it represents the laws of nature that uphold the evolution of all life throughout creation. When behavior is in accord with these laws of nature, then it is right behavior—evolutionary for both the individual and society. Maharishi explains, however, that it is not necessary to understand every Law of nature; rather, one can learn to live spontaneously in accord with natural law through the technologies of his Vedic Science.

In the following pages we will examine several verses from the Rāmāyaṇ that support Maharishi's interpretation, an elucidation that will better enable us to understand the role of *Dharma* in the Rāmāyaṇ, and indeed throughout the Vedic literature. These verses will also show how the Rāmāyaṇ provides a practical philosophy for unfolding what Maharishi terms the "fruit of all knowledge," a mistake-free life in perfect accord with natural law for every individual and every society.

The Rāmāyaṇ in the Context of the Vedic Literature

The Vālmīki Rāmāyaṇ has long held a special place in the hearts and minds of the people of India. It tells the story of Rām, the great and noble prince of ancient Ayodhyā, who, as the result of a deceitful plan to

¹ We have decided to adopt the convention of transliteration used by Maharishi in his *Absolute Theory of Government: Automation in Administration*, which enables those without formal Sanskrit training to more accurately pronounce the Sanskrit expressions.

undermine his sovereignty, was banished to the forest for fourteen years with his illustrious wife Sītā. The story of Rām's adventures in the forest, his victory over the evil Rāvaṇ, his triumphant return to Ayodhyā, and the ideal civilization under his rule, have been a source of inspiration to millions of individuals through the ages.

While the narrative has delighted so many, Maharishi emphasizes the Rāmāyaṇ's deeper value in relationship to the whole Vedic literature. He explains that Vedic literature is more than a collection of books on various topics; it is the expression of the most fundamental level of nature's functioning, the self-interacting dynamics of a Unified Field of Pure Consciousness. Maharishi's insight is that the entire universe—including all the laws of nature that give rise to and administer every aspect of individual and cosmic life—is the expression of an unbounded field of pure intelligence. He (1995c) describes this field as self-referral consciousness,² a field of wakefulness, the omnipresent, essential constituent of creation lying beyond time, space, and causation: "Consciousness is wakefulness, unbounded alertness, pure intelligence, pure existence, self-referral fullness, all knowingness—the self-sufficient and unmanifest source, course, and goal of all creation" (p. 24).

Maharishi (1963) describes the different aspects of creation as ripples and waves in this vast ocean of life (p. 26). He explains that within this field of wakefulness, all the activities of life are created, controlled, and administered. Maharishi refers to self-referral consciousness as the "total potential of Natural Law," for it is the source of each of the infinite number of laws of nature that manage every aspect of life: "All the innumerable Laws of Nature carrying out the process of creation, evolution, and dissolution, in different parts of the universe, are all the diverse expressions of the one eternal cosmic law" (p. 54).

Maharishi explains that through its own self-interacting dynamics self-referral consciousness expresses itself as the diversified forms and phenomena in creation. In assuming the role of material universe, it moves within itself, creating a dynamic structure within its eternal silence. This structure is termed *Shruti*, which Maharishi (1995b) describes as "vibrancy of intelligence in the form of sound generated by the self-referral dynamics of consciousness—those specific sounds that

² Maharishi explains that it is self-referral because it is eternally self-knowing and self-sufficient—it has no reference to anything outside itself.

construct self-referral consciousness” (p. 352). These sounds *are* the Vedic literature on its most fundamental level, and it is their phonetic record that is found in the Vedic texts. Maharishi points out that *Shruti* is “the sounds that are available to us in the Veda³ and Vedic Literature. Through proper use of these sounds, the entire Vedic Technology—the whole engineering of creation, all the secrets of nature’s silent functioning—is available to us” (p. 352).

Tony Nader, M.D., Ph.D., working closely with Maharishi, recently discovered that these sounds, available in the Vedic literature as its *Sūtra* and verses, are also the fundamental basis and essential ingredient of the human physiology. He (1995) has documented a precise correlation between the forty aspects of the Vedic literature and human physiology, finding that there is an exact correspondence between the structure and function of human physiology and the structure and function of the self-interacting dynamics of self-referral consciousness.

Thus we find in this description the basis for the Rāmāyaṇ’s reliability as a guide for proper living and proper behavior. The Vālmīki Rāmāyaṇ is not the fabrication of an ancient author, nor some poetic fancy, but is the expression of fundamental dynamics of nature’s functioning. While we will be examining principles brought out in the narrative—the most expressed value of the text—these principles are the expressions of the self-interacting dynamics of pure consciousness, and are thus fully in accord with the most fundamental level of natural law.

The Availability of Self-Referral Consciousness

In order to appreciate the practical significance of *Dharma* in the Rāmāyaṇ, we must examine a critical feature of Maharishi Vedic Science: the availability of self-referral consciousness to human awareness. Through the technologies of Maharishi Vedic Science, principally the Transcendental Meditation and TM-Sidhi programs, any individual can directly experience self-referral consciousness and use it to improve all facets of life. During the Transcendental Meditation technique, Maharishi (1995b) explains, the mind effortlessly settles to its least excited level, a state of inner wakefulness, the Self:

³ Veda means pure knowledge, complete knowledge. It refers to the structure and function of self-referral consciousness, including its infinite organizing power.

My Transcendental Meditation is a simple, natural, effortless procedure whereby the mind easily and naturally arrives at the source of thought, the settled state of mind—Transcendental Consciousness—pure consciousness, self-referral consciousness, which is the source of all creative processes. (p. 280)

In the Vedic language, self-referral consciousness is known as *Ātmā*. *Ātmā* is the simplest form of human awareness, but it is also the same self-referral consciousness that is the managing intelligence of the universe, the home of all the laws of nature. Thus, the most fundamental level of nature's functioning can be located when the conscious mind identifies itself with its simplest state. The value of directly experiencing *Ātmā* has been documented in more than 600 scientific studies conducted at over 200 universities and research institutions in 30 countries.

The TM-Sidhi program is an advanced technology of Maharishi Vedic Science that trains an individual to think and act from the level of self-referral consciousness (Maharishi, 1994, pp. 260–262). Its practice unfolds the capacity to produce different phenomena from that level, including a wide variety of abilities. These include the enhancement of such human virtues as love and compassion, and even “*Yogic Flying*,” the ability to move through the air by mere intention. Practitioners of *Yogic Flying* experience “bubbling bliss” in their performance, and from their experience of self-referral consciousness they create a powerful influence of harmony in the environment and in the world (Gelderloos & van den Berg, 1989, pp. 324–371).

That individuals can identify themselves with the total potential of natural law is a startling concept, for the Western scientific tradition studies the laws of nature as objective phenomena. Significantly, the ultimate goal of the technologies of Maharishi Vedic Science is not to enjoy self-referral consciousness simply for the experience, but rather to enliven it permanently in the awareness. As we shall later see, the regular experience of self-referral consciousness cultures the mind to spontaneously function from the deepest level of life, and thus perform in perfect accord with natural law.

In the following section we will begin analyzing selected verses from the Rāmāyaṇ in the light of the principles of Maharishi Vedic Science and Technology. Before we begin, however, it is important to indicate a preference of text. While the Critical Edition of Bhaṭṭ and Shah (1975)

is the choice of most modern scholars, Maharishi's interpretation of the Vedic literature as the precise expressions of the structuring dynamics of self-referral consciousness raises doubts about the Critical Edition's merit. It further questions the validity of applying contemporary critical practices that do not rely on the direct experience of *Shruti*—the unmanifest sounds of the self-interacting dynamics of consciousness—to the creation of critical editions of the Vedic literature.⁴ While Western philological methodology may be appropriate for ordinary literary works, for the Vedic literature such approaches are excessively speculative. Hence, we have chosen an edition of the traditional southern recension that has been compiled from reputable manuscripts (R. Narayanaswami Aiyar, 1958). While this choice may raise text-critical issues that cannot be resolved within the limits of this paper, those who prefer the Critical Edition will note that many of the passages cited below have been accepted by its editors.

The Principle of *Dharma*

Dharma is a technical term found throughout the Vedic literature that bears special import in the Rāmāyaṇ. Many lengthy passages in the Rāmāyaṇ concern themselves specifically with its application, and indeed the hero Rām is described (*Uttara Kāṇḍ*, 101.17) as साक्षाद्धर्ममिवापरम् *sākṣhād Dharmam ivāparam* (“the personification of *Dharma*”). While the ancient commentators of the Rāmāyaṇ, as well as some modern scholars, have attempted to unravel the seeming complexities of *Dharma* (Khan, 1965), translators have tended to represent it as a set of arbitrary and inconsistent societal conventions developed by ancient ancestors and passed from generation to generation (Goldman, 1984, p. 53).

Dharma is often translated simply as “righteousness,” “law,” “duty,” or the like. While such renderings are often appropriate, we will see in the following verses that in some contexts such a translation is incomplete or inadequate. For example, in the following verse Rām's wife Sītā ascribes to *Dharma* something more than duty or righteousness:

⁴ For a more complete examination of the Critical Edition in light of the principles of Maharishi Vedic Science and Technology, see Sands, 1994.

धर्मादर्थः प्रभवते धर्मात्प्रभवते सुखम्
धर्मेण लभते सर्वं धर्मसारमिदं जगत्

*Dharmād arthaḥ prabhavate dharmāt prabhavate sukham
dharmaṇa labhate sarvaṁ dharmasāram idaṁ jagat*

(*Aranya Kāṇḍ*, 9.30)

*Wealth arises from Dharma, happiness emerges from
Dharma. Everything is obtained by means of Dharma, for
the world has Dharma as its essence.*

In this passage, *Dharma* as a purely human convention inadequately explains *Dharmasāra*, literally “has *Dharma* as its essence.” Shastri (1985, Vol. II, p. 20), like many translators, correctly assesses the significance of *sāra* (“constituting its very marrow”), but his translation of *Dharma* as “duty” leaves the reader at a loss to understand how the world could have duty as its essence (“the whole world [has] duty constituting its very marrow”).⁵ While *jagat* (“world”) can justifiably be taken as “society” or “mankind”—suggesting that *society* has righteousness or duty at its basis (Monier-Williams, 1984, p. 1208)—the inclusion of *idaṁ* (“this”)⁶ along with *jagat* (“world”) suggests the physical world and thus works against Shastri’s reading.

It is difficult to interpret *Dharma* as the fundamental constituent of the world if one insists on it exclusively as a social code such as “righteousness” or “duty.” It nonetheless fits perfectly with Maharishi’s (1969) description:

धर्ममूलं जगद्राजन्नान्यद्धर्माद्विशिष्यते

Dharmamūlaṁ jagad rājan nānyad dharmād vishishyate
(*Aranya Kāṇḍ*, 33.48)

*The world has Dharma as its source, O King. There is nothing
higher than Dharma.*

⁵ The *Mahābhārat* (Pandit Ramachandrashastri Kinjawadekar, ed., 1979), another aspect of the Vedic literature, gives a similar description of the relationship between *Dharma* and the world:

⁶ *Idam* generally designates something concrete near the speaker, but often refers inclusively to the entire material creation.

Dharma is that invincible power of nature which upholds existence. It maintains evolution and forms the very basis of cosmic life. It supports all that is helpful for evolution and discourages all that is opposed to it. (p. 26)

In this definition, Maharishi (1995b) describes *Dharma* as the foundation of life, thus equating it with the most fundamental level of nature's administration, the abstract, unmanifest ruler of the ever-expanding universe (pp. 36–37). *Dharma* is “that which upholds the universe” (p. 30), the indomitable force that advances all that is good in life, and which “promotes worldly prosperity and spiritual freedom” (1969, pp. 26–27). Hence, it is synonymous with natural law (1995b, pp. 36–37). In this passage Maharishi also speaks of *Dharma* as maintaining evolution, though not in the Darwinian sense; rather he is citing the fundamental dynamics that advance life naturally to its supreme value, the unfoldment of higher levels of human development. In the following, he (1980) discusses natural law, or *Dharma*, in this evolutionary role:

The purpose of Natural Law is to evolve life to perfection, to take life to its source, which is the absolute, non-changing field of all possibilities. Even though each law has its own specific level of performance and activity, the responsibility of that law, seen in the sequence of all the Laws of Nature, is found to be in the direction of evolution toward more and more. (p. 75)

In Maharishi's view, the fulfillment of *Dharma* is perfection, achieved in higher states of consciousness—higher levels of human awareness in which an individual is completely awake to the unbounded value of life. In higher states of consciousness, one is fully and permanently established in self-referral consciousness and enjoys complete freedom, perfect fulfillment, and a mistake-free life in accord with natural law. Maharishi Vedic Science and Technology identifies four higher states of consciousness, including Transcendental Consciousness—pure, self-referral consciousness—and three hierarchically structured states in which self-referral consciousness is maintained along with waking, dreaming, and deep sleep.⁷ In Maharishi's analysis, these higher levels

⁷ These three states are: Cosmic Consciousness, in which an individual experiences the full range of self-referral consciousness along with waking state, dreaming state, and deep sleep; God Consciousness, which includes the experience of self-referral consciousness along with the ability to appreciate the finest level of creation; and Unity Consciousness, in which one not only experiences self-referral consciousness as the ultimate reality of oneself, but also of all objective phenomena. For a more complete description of Maharishi's vision of higher states of consciousness, see Alexander et al., 1989, pp. 324–371.

of consciousness are the goal of human evolution, and it is toward them that the laws of nature guide every individual.

Maharishi's interpretation of *Dharma* as the upholder of the universe does not preclude the different social customs and norms of behavior; however, it does place them in a larger perspective. Since *Dharma* sustains the evolution of the entire cosmos, its application is found in every aspect of life and, in turn, in every level of society including individual, family, and nation. Maharishi (1969) explains:

'*Dharmas*', the plural of *Dharma*, signifies the different powers of nature upholding different avenues of the way of evolution. They take expression as specific modes of activity or different ways of righteousness, which keep the whole stream of life in harmony—every aspect of life being properly balanced with every other aspect—and moving in the direction of evolution. (p. 64)

As we can see, Maharishi holds that the individual "*Dharmas*" are not based on human conventions, but are specific laws of nature that sustain individual growth and progress. Therefore, translating *Dharma* as "righteousness" in some contexts may be acceptable, provided the reader understands righteousness as behavior that is in accord with natural law, and not dependent upon social custom.

If the previous verse from the Rāmāyaṇ (*Aranya Kāṇḍ*, 9.30) were an isolated example, without adequate manuscript support, one might be tempted to accept the conventional interpretation of *Dharma*. However, the following verse also places *Dharma* beyond human convention. In a discussion with the hero Hanumān, Lord Rām equates *Dharma* with *Ātmā*, located within the heart and mind of every individual:

सूक्ष्मः परमदुर्ज्ञेयः सतां धर्मः प्लवंगम
हृदिस्थः सर्वभूतानामात्मा वेद शुभाशुभम्

*Sūkṣmah paramadurgyeyah satāṃ dharmah plavaṅgama
hṛdiṣṭhah sarva-bhūtānām ātmā veda shubbāshubham*

(*Kishkindhā Kāṇḍ*, 18.15)

The Dharma of the righteous is subtle and extremely difficult to know,⁸ O Monkey; established in the heart it is the Self of all creatures. It (Dharma) knows what is righteous and unrighteous.

“The *Dharma* of the righteous is subtle and extremely difficult to know” may appear to denote its intellectual obscurity; in fact, many discussions throughout the Rāmāyaṇ suggest as much. But Rām extends the meaning of *Dharma* and explains *why* it is difficult to know by equating it with *Ātmā* (“the Self”), which he locates at the most fundamental level of animate life (*hrīdīsthaḥ sarvabhūtānām*, “established in the heart of all creatures”). He further declares that *Ātmā* “knows what is righteous or unrighteous” (*veda shubhāshubham*), thus asserting that while an individual may not always intellectually understand what is *dharmic* (*shubha*, in accord with *Dharma*) or *adharmaic* (*ashubha*, in violation of *Dharma*), right and wrong is spontaneously determined on the universal level of *Ātmā*. Consequently, to understand *Dharma* one must know *Ātmā*, for *Ātmā* is the total potential of natural law, and on the level of *ātmā* right action is computed. In this interpretation, *Dharma* clearly cannot be a mere product of society.

Support for the interpretation of *Dharma* as the total potential of natural law comes from an unlikely source. Rām’s stepmother Kaikeyī, the perpetrator of his exile, states:

आहुः सत्यं हि परमं धर्मं धर्मविदो जनाः

Āhuḥ satyaṁ hi paramaṁ dharmam dharmavidō janāḥ

(*Ayodhyā Kāṇḍ*, 14.3)

The people who are the knowers of Dharma, say that satya is the supreme Dharma.

⁸This point is also brought out in the Mahābhārata:

धर्मश्च सूक्ष्मो निपुलोपलक्ष्यः

Dharmakṣhcha sūkṣhmo nipulopalakṣhyaḥ

(2.67.38)

And Dharma is subtle, perceived only by the enlightened.

The most common translation of *satya* is “truth,” which would enable this verse to express truth as the supreme (*parama*) *Dharma*. Maharishi (1971), however, adds a more profound understanding to *satya*: it is “that which never changes,” immortal, non-changing pure consciousness. This interpretation of *satya* represents the most fundamental understanding of truth, for fully awake self-referral consciousness is its very definition; it is the source of all that is, was, or will ever be, and the whole field of diversity is found as an expression of its structure. In recent years, Maharishi (Maharishi Vedic University, 1993, p. 199) often expresses this interpretation by translating *satya* as “absolute alertness,” referring to fully awake self-referral consciousness. This translation does not replace “truth” but rather adds an additional, more profound, understanding.⁹ Applying Maharishi’s interpretation to the above verse (*Ayodhyā Kāṇḍ*, 14.3) enables us to translate it as:

⁹ Maharishi’s interpretation is consistent with both the etymology of *satya* and with other occurrences in Vedic literature. *Satya* is derived from *sat*, the *vartamāne kṛidanta* (present participle) of *as* (“to be” or “to exist”). The suffix *ya* provides the sense of a state of existence or Being, terms that Maharishi has employed to describe pure self-referral consciousness, 1966. The following verse from *Yoga Vasishtha*, a text of Vedic literature, describes *satya* as the supreme reality of life:

यस्मिन्सर्वं यस्य सर्वं यतः सर्वं यस्मादिदम्
येन सर्वं यद्धि सर्वं तत्सत्यं समुपास्महे

*Yasmin sarvaṃ yasya sarvaṃ yataḥ sarvaṃ yasmādidam
yena sarvaṃ yaddhi sarvaṃ tatsatyam samupāsmāhe*

(*Yoga Vasishṭha*, *Upashāma Prakāraṇa*, 8.12)

*We are dedicated to that which is absolute alertness, in which
everything exists, to which everything belongs, from which every-
thing has emerged, by which everything is sustained, and which
indeed is everything.*

This translation employs Maharishi’s rendering of *satya* as “absolute alertness,” permitting a more plausible interpretation of the verse than would “truth.” Otherwise one is left with truth as the entity in which everything is established, from which everything emerges, etc., a clearly inadequate notion, inconsistent with the teaching of the *Rāmāyaṇa*. While “truth” may suffice for *satya* in many contexts, clearly *satya* often requires a deeper understanding, which Maharishi’s translation of “absolute alertness” supplies.

The people who are the knowers of Dharma say that the supreme Dharma is absolute alertness, the Self.

The equation of *Dharma* with absolute alertness reinforces the interpretation of *Dharma* as the total potential of natural law. This reading hinges upon the understanding of *satya* as absolute alertness, which Kaikeyī supports with a subsequent definition:

सत्यमेकपदं ब्रह्म सत्ये धर्मः प्रतिष्ठितः

Satyam ekapadam Brahm satye dharmah pratisthitah

(*Ayodhyā Kāṇḍ*, 14.3)

*Satya is the single syllable (the Praṇava), it is Brahm;
Dharma is established in Satya.*

The sequence of expressions here is highly significant. Kaikeyī first defines *satya* as the transcendental reality by equating it with *Brahman* (fully awake self-referral consciousness).¹⁰ Secondly, she asserts that *Dharma* (here the individual *Dharmas*) is rooted in this self-referral field. If only the second *pāda* were available (*satye Dharmah pratisthitah* “*Dharma* is established in *satya*”), the conventional interpretation of *satya* as truth would be adequate, for one could justifiably argue that righteousness is rooted in truth. But the initial equation of *satya* with *Brahman* makes this reading unsatisfactory; rather, it suggests that the individual *Dharmas* are in fact established in *Brahm*.

Rām accords *satya* the status of ruler—and in Maharishi Vedic Science the ruler of the world is the managing intelligence of the universe—while describing the source of *Dharma* as absolute alertness:

सत्यमेवेश्वरो लोके सत्ये धर्मः सदाश्रितः

¹⁰ Maharishi (Maharishi Vedic University, 1993, p. 123) explains the nature of *Brahm* in his commentary on the following expression from the Aitareya Upanishad (3.1.3): प्रज्ञानं ब्रह्म—*Pragyānam Brahm*—Fully awake self-referral dynamism (of the universe) born of the infinite organizing power of pure knowledge, the Veda—fully awake totality of the individual consciousness is *Brahm*, which comprehends the infinite dynamism of the universe in the infinite silence of the Self.

सत्यमूलानि सर्वानि सत्यान्नास्ति परं पदम्

*Satyam evaśhvaro loke satye dharmah sadāśhritaḥ
satya-mūlāni sarvāni satyān nāsti param padam*

(Ayodhyā Kāṇḍ, 109.13)

*Absolute alertness alone is the ruler in the world; Dharma
is ever established in absolute alertness. All things have
their source in absolute alertness, there is no higher state
than absolute alertness.*

Here again the conventional sense of truth is an inadequate translation of *satya*, for not only is *Dharma* (the individual *Dharmas*) said to be ever established in *satya* (*satye Dharmaḥ sadāśhritaḥ*), but all things have their source in *satya* (*satyamūlāni sarvāni*). “Absolute alertness,” then, is clearly preferable—particularly in the second expression—for there is little justification for suggesting that the prevalent sense of truth is the source of the material creation.

The first expression of the verse is also significant, for it calls *satya* the Lord (or ruler) *in* the world. This expression again suggests self-referral consciousness, for in Maharishi Vedic Science self-referral consciousness not only creates and administers the universe, but is also found within every grain. The final expression *satyān nāsti param padam* (“there is no higher state than absolute alertness”) appears to confirm *satya* as absolute alertness, the administrator permeating every aspect of creation.

From the above selection of verses, we can conclude that the term *Dharma*, as found in the Rāmāyaṇ, not only describes specific evolutionary activities, but also the total potential of natural law. In the following section, we will examine the relationship between *Dharma* and individual life by showing how the Rāmāyaṇ reveals the technique for spontaneously living in accord with *Dharma*.

Enlivening *Dharma* in Individual Life

Throughout the Rāmāyaṇ, the reader is continually faced with the complexity of *Dharma*. In addition to its holistic perspective discussed above, the Rāmāyaṇ also presents individual actions—both *dharmic* and *adharmaic*—often perplexing to the characters in the story as well as to

the modern reader who tries to predict appropriate courses of action. For example, when hearing of Rām's intention to comply with his exile, his mother Kausalyā argues that his duty (*Dharma*) lies in serving her. Rām counters by citing a higher *Dharma*—the need to fulfill his father's command (R. Narayanaswami Aiyar, 2.21.45 ff.). In this simple example we see two contradictory expressions of behavior, both apparently in accord with *Dharma*, and yet it is difficult to discern the one *most* correct or *dharmic*.

The dilemma of how to act correctly is, of course, a central problem in cultures of every era of human history. Maharishi, speaking to this concern, notes that correct behavior is action in accord with all the laws of nature, but because there are so many laws it is impossible to know them all, and thus what constitutes right action in every context. However, he provides a practical and effortless solution for ensuring right action. Speaking in the context of management, Maharishi (1995a) explains:

It is not possible to have the knowledge of all the systems and all the laws that govern different fields of management, and without the knowledge of the laws that govern different aspects of the life of the individual, or national or international life, it is not possible to become a perfect manager. Therefore, it is very necessary to find a way so that even without the knowledge of all these innumerable laws that govern different areas of creation and evolution, the trained manager should be able to manage any field of management that he undertakes to manage from the basis of all the Laws of Nature, like a gardener who manages the whole tree by simply handling the root.

To develop this quality of management it is necessary to gain the ability to handle the whole field of management from the fundamental of management—self-referral consciousness—WHOLENESS. (pp. 94–96)

Maharishi here illustrates that to act in accord with natural law one must learn to function from the transcendental field of pure consciousness. By regularly experiencing self-referral consciousness one cultures the ability to spontaneously maintain the awareness on that level and operate from it. As the total potential of natural law becomes lively in

the awareness, the ability to think and act in accord with the laws of nature spontaneously grows:¹¹

Vedic Science takes the human awareness to its simplest state. In its self-referral state it enlivens the total potential of Natural Law. When the total potential of Natural Law is enlivened in human awareness this makes a man spontaneously act according to Natural Law. (1988)

To fully understand how we can engage the support of nature we may recall Maharishi's point that the total potential of natural law is not an entity that lies outside oneself; it is the simplest form of our own awareness. Thus, when we establish our awareness permanently on that level, we *are* the total potential of natural law, and every action we take is a reflection of this reality. Maharishi's use of the word *spontaneously* is especially important for it underscores his point that life in accord with natural law is not the result of intellectual analysis; rather, one established in a higher state of consciousness effortlessly and naturally functions in accord with the laws of nature, without necessarily understanding the individual laws involved. The result is a life free of mistakes, without stress or strain, in which all desires are spontaneously fulfilled.

A compelling element of Maharishi's vision of natural law is the absence of a systematic code of conduct. While most societies necessarily rely on codes of behavior, either as customs or formally documented rules, Maharishi explains that life in accord with natural law arises from the direct experience of the total potential of natural law, and not from compliance with a specified set of "do's and don'ts." It is significant that this holistic approach can eliminate the need for codified standards of behavior, for it provides the means for every individual to spontaneously act in an appropriate and socially acceptable manner, whatever rules are applicable to the circumstances.

This understanding of action in accord with natural law helps make sense of several important verses in the Rāmāyaṇ. While the Rāmāyaṇ's heroes often engage in lengthy discussions regarding the "correctness"

¹¹ This point is brought out by Maharishi in his commentary on the Bhagavad-Gītā, where he (1969) explains that Arjuna's conflict lies in his inability to determine whether to follow his family *Dharma* or his warrior *Dharma*, which appear to conflict. While many significant principles about *Dharma* come out of the ensuing verses, the principal method of resolving Arjuna's dilemma is Lord Kṛishṇa's instruction to transcend, and having become established in pure consciousness to act spontaneously in accord with natural law (verses 45 & 48).

of their actions, the text also provides examples of life in accord with natural law based on the development of full potential. For example, while in the forest Sītā comments to Rām:

आत्मानं नियमैस्तैस्तैः कर्षयित्वा प्रयत्नतः
प्राप्यते निपुणैर्धर्मो न सुखाल्लभते सुखम्

*ātmānaṁ niyamais tais taiḥ karṣhayitwā prayatnataḥ
prāpyate nipuṇair dharmo na sukhāl labhate sukham*

(Aranya Kāṇḍ, 9.31)

Let us first examine Sheldon Pollock's (in press) translation, a representative modern interpretation:

*But righteousness belongs only to the vigilant, those who
relentlessly control themselves by various acts of self-re-
straint. No, true happiness is not easily won.*

Pollock's translation emphasizes that righteousness (life in accord with *Dharma*) results from "various acts of self-restraint" (*niyamais*), and though we will shortly disagree with the element of control that his translation implies, it nonetheless brings out an important point: in the view of the Rāmāyaṇ, righteousness is not developed through intellectual analysis but through self-development. In other words, the consideration of right and wrong is not enough, for there are too many variables for any individual to comprehend. The "vigilant" acquire spontaneous right action through the development of their potential.

Maharishi's interpretation of *niyam* (the root from which *niyamais* is derived), moreover, presents a more profound understanding of this verse. In his commentary on the Bhagavad-Gītā, Maharishi (1969) comments on *niyamya*—the gerundive form of *niyam*—as

literally having introduced law and order, having organized something to function in an orderly manner. Even the word 'organize' is inadequate to convey the accurate meaning, but it has been chosen to avoid the sense of control and restraint which has generally been implied by commentators and which has only resulted in mutilating the whole meaning and purpose of the teaching. (p. 241)

Maharishi elaborates in his commentary on a later verse (6.26), in which he translates *niyamyā* as “having withdrawn,” indicating that the mind has withdrawn from the world of the senses. Hence, the awareness has “turned back to the Self” (p. 435) which, as we have seen, is the most orderly state of life and the source of nature’s orderliness.

Maharishi’s commentary enables us to highlight a subtle and yet profound understanding of this verse. According to Pollock’s translation, the vigilant learned to live in accord with *Dharma* through self-control, but the application of Maharishi’s interpretation of *niyam* depicts the ability to live in accord with *Dharma* through the regular experience of *ātma*, the Self. In this light we may now read the first part of 3.9.31 as follows:

Dharma is obtained by the wise,¹² drawing the Self out by continually turning back to the Self.

“Drawing the Self out” (*Atmānam karshayitvā*) refers to the growing ability to maintain self-referral consciousness in activity, outside the inner experience of the Self. Maharishi has pointed out that the practice of the Transcendental Meditation technique naturally cultures the nervous system through the regular alternation of the experience of self-referral consciousness and activity, so that both mind and body become increasingly capable of supporting self-referral consciousness along with waking, dreaming, and deep sleep. This verse expresses the need for *repeated* experience of self-referral consciousness by stating that the wise draw the Self out “by continually (*tais taiḥ . . . prayatnataḥ*) turning back to the Self (*niyamais*).” Accordingly, the verse implies that the wise obtain *Dharma* not through intellectual analysis, legal discussion, or ethical codes, but by establishing the total potential of natural law in their awareness.

In the same vein, the ancient *Rishis* are said to have secured *Dharma* in their lives through *tapas* (and, by implication, not through intellectual analysis):

तपसा भावितात्मानो धर्मस्यानुग्रहे रताः

Tapasā bhāvitāt māno dharmasyānugrahe ratāḥ

(*Yuddha Kāṇḍ*, 35.18)

¹² “Wise” is a more appropriate translation of *nipuṇa*, particularly in this context.

Intent on the acquisition of Dharma, they have purified themselves by tapas.

Tapas is a technical term that refers to procedures and methods of purification for unfolding perfection in human life (p. 379). It is usually translated as “austerity,” the presumption being that sages and seekers of enlightenment underwent severe mortification and arduous “penances” for the sake of unfolding the supreme reality of life.¹³ Maharishi (1971), however, provides a more profound understanding of tapas, noting that:

Tapas means increasing in glow—glow of life. Life is infinity, immortality, immovability, unboundedness, absolute. So increasing value of the glow of life means the increasing value of infinity, of immortality, of unboundedness, of absolute Being.

Maharishi (1971) also comments that this “glow of life” spontaneously grows when purity and contentment increase through the regular experience of self-referral consciousness. From this perspective, the above verse discloses that the sages grew in *Dharma* through their unfoldment of self-referral consciousness, not from intellectual understanding.¹⁴

¹³ The following provides an example of *tapas* being used to remove imperfection and create “Perfected Beings”:

सिद्धा वैखानसा यत्र वालखील्यश्च तापसाः

वन्दितव्यास्ततः सिद्धास्तपसा वीतकल्मषाः

Siddhā Vaikhānasā yatra Vālakhilyāśh cha tāpasāḥ

vanditavyās tataḥ siddhās tapasā vītakalmashāḥ

(*Kishkindhā Kāṇḍ*, 43.32)

There dwell perfected ascetics—Vaikhanāsas and Vālakhilyas.

These perfected beings have been completely rid of blemish through tapas, and are thus to be honored.

¹⁴ Maharishi’s view is supported throughout the *Rāmāyaṇ*. In one example Rām and Sītā encounter Anasūyā—a female sage who remarks to Sītā:

नियमैर्विविधैराप्तं तपो हि महदस्ति मे

तत्संश्रित्य बलं सीते छन्दये त्वां शुचिव्रते

Niyamair vividhair āptaṁ tapo hi mahad asti me

tat saṁshritya balaṁ Sīte chbandaye tvāṁ shuchivrate

An additional passage supports this view that life in accord with *Dharma* is not based on intellectual understanding. In this verse, Sītā does not refer to the means for growing in *Dharma*, but rather to the result of being established in it. She remarks to Kausalyā:

धर्माद्विचलितुं नाहमलं चन्द्रादिव प्रभा

Dharmād vichalituṃ nāham alaṃ chandrād iva prabhā

(*Ayodhyā Kāṇḍ*, 39.28)

I am not able to deviate from Dharma any more than the rays from the moon.

This verse suggests more than an intellectual familiarity with the laws of *Dharma* and a willingness to obey them, for as we find throughout the Rāmāyaṇ, determining what is proper is difficult and often impossible. Rather, the metaphor of the moon and its rays suggests a profound connection between Sītā's actions and her essential nature. The rays of the moon are a natural byproduct of the fullness of the moon's light; there is no calculation nor analysis in their emanation. They simply act in harmony with the laws of nature that govern their activity. Sītā likewise does not express reluctance to act outside of *Dharma*; rather, she states emphatically that she is unable to. Her consonance with *Dharma* is thus a spontaneous result of the fullness of her own Being, and nothing with which she needs to contemplate nor interfere.

Thus far we have seen how Maharishi's comments on the nature of *Dharma* and natural law provide a theoretical basis for better understanding a number of key verses in the Rāmāyaṇ. In the next section, we

(*Ayodhyā Kāṇḍ*, 118.14)

Indeed I have accumulated great tapas from various practices; taking recourse to that power, O Sītā of pure behavior, I wish to confer a boon on you.

Here *tapas* is described as the result of various practices, not as the practice of austerities. Maharishi's description of *tapas* as the growth of pure consciousness assists our understanding of this verse.

will examine how the Rāmāyaṇ brings out the knowledge of *Dharma* through its central hero, Rām.

Rām as the Embodiment of Natural Law

Most scholars since Hermann Jacobi's mid-nineteenth century study (1893) have concluded that Rām was originally cast as a thoroughly human, though extraordinarily gifted, prince of Ayodhyā (Goldman). They speculate that Rām's divine status was superimposed during the text's long history of transmission, transformed by "itinerant singers" who embellished upon the original Rāmāyaṇ to enhance the enjoyment of their audience and to reflect their own system of beliefs (Bulcke, 1960, pp. 36-66). References to Rām's extraordinary abilities and his remarkable personality are thus dismissed by scholars as either interpolations, or if manuscript evidence requires, as epic hyperbole.

Maharishi (1991) presents a notably different perspective, however, describing Rām as "the supreme element, the full blossom of total intelligence." He further notes that "the words from the Rāmāyaṇ are: *Rām Brāhm*, *paramāratha rūpā*; Rām is Totality, Rām is *Brahm*. The knowledge of Rām is the knowledge of *Brahm*." Thus, Maharishi holds Rām to be the embodiment of *Brahm*—the supreme Totality of life. In this view, Rām is the essential nature of the whole creation, governing and sustaining it from the transcendental level; he is the absolute government, the managing intelligence of creation, which silently administers the ever-expanding universe:

Rām is *Brahm*, and his body is pure spirituality (*paramāratha rūpā* is pure spirituality), the quantum mechanical body. Only in this position, only in this state, can he be the ruler of the universe. The ruler of the universe, ruling infinite diversity, has that miraculous structure of creative intelligence that is the sum total of all the possible diverse values. (1991)

The ruler of the universe, Maharishi explains, is fully awake self-referral consciousness, silently organizing every aspect of the universe without mistakes. To be the ruler of the universe, as Rām is so often called throughout the Rāmāyaṇ,¹⁵ he must be identified with the total potential of natural law, that level of life which governs through its transcendental, omnipresent, and all-pervading nature. Maharishi (1995b)

¹⁵ For example, see *Sundara Kāṇḍ*, 51.43, which describes Rām as सर्वलोकेश्वर: "ruler of all the worlds," referring to the entire field of relative life.

further states that “Rām, in Rāmāyaṇ, is portrayed as the embodiment of *Dharma*—natural law—*Purushottam*¹⁶—the abstract, unmanifest, absolute ruler of the ever-expanding universe (pp. 36–37).”

Maharishi’s view of Rām is well-corroborated throughout the Rāmāyaṇ. Rām is not only the knower of *Dharma*, but according to the enlightened *Rishis* he is the knower of the supreme *Dharma* (परमधर्मज्ञ *parama-dharma-gya*, *Aranya Kāṇḍ*, 6.7) and is one whose Self (*Ātmā*) is firmly established in *Dharma* (धर्मे धृतात्मा *Dharme dbhitātmā*, *Aranya Kāṇḍ*, 6.26). Thus, his command of *Dharma* is based upon his state of awareness and not merely on his acute understanding of ancestral mores.

Maharishi makes it clear that Rām is more than an enlightened man; he is the embodiment of the total potential of natural law, organizing the universe from the transcendental level (p. 41). This view is emphasized throughout the traditional southern recension of the Rāmāyaṇ, particularly in the famous passages of the *Bāla*, *Yuddha*, and *Uttara Kāṇḍas* where Rām’s divine status is clearly noted. While many passages have been accepted by the Critical Edition—such as Dasharatha’s proclamation of Rām’s divine origin—they are often dismissed by scholars as either early interpolations or hyperbolic descriptions of a mythical king. Nevertheless, we will see that when viewed in the light of Maharishi Vedic Science, these descriptions of Rām take on a new significance fundamental to the proper understanding of his nature.

In our first example, taken from the *Yuddha Kāṇḍ*, the hero Hanuman warns Rām’s nemesis, Rāvaṇ, of Rām’s might:

सर्वल्लोकान्सुसंहत्य सभूतान्सचराचरान्
पुनरेव तथा स्रष्टुं शी रामो महायशः

*Sarvāṁllokān susaṁbhṛitya sabbūtān sacharācharān
punar eva tathā srashtuṁ shakto Rāmo mahāyashāḥ*

(*Yuddha Kāṇḍ*, 51.39–40)

Easily withdrawing all the worlds together with all beings both moving and unmoving, the mighty Rām is capable of creating them again. This verse is generally considered a description of Rām’s physical

¹⁶ Maharishi (1995b) explains that the intelligence within every grain of creation has a silent quality known as *Purusha*. *Purushottama* is the congregate of all the innumerable *Purusha* in the universe. It is thus Totality, *Brahm*, the silent level of the ruler of the universe (pp. 370–372).

strength—his ability to conquer anyone at any time. But in a larger sense, it is strikingly consistent with the traditional depiction of the beginning and end of the universe (e.g. Swāmī Vijñānanda, trans., p. 3). Note that Hanuman does not say Rām can destroy the worlds; rather, he says that Rām is able to easily withdraw them (*lokān susaṃhṛitya*). Moreover, Hanuman observes that Rām is capable of creating them again (*punar eva tathā srashtuṃ shaktaḥ*), an achievement exclusively within the purview of natural law. Hence, Hanuman not only provides Rāvaṇ with a picture of Rām’s valor and strength, but more significantly he depicts Rām’s role as creator and managing intelligence of the universe.

Speaking to Sītā, Hanuman supports the interpretation of Rām as the most profound level of *Dharma*, the level that gives rise to and upholds the entire universe. His point is both important and intriguing:

मर्यादानां च लोकस्य कर्ता कारयिता च सः

Maryādānāṃ cha lokasya kartā kārayitā cha saḥ

(*Sundar Kāṇḍ*, 35.11)

He is the creator and the instigator of the boundaries of the world.

In this half verse, Hanuman defines Rām by two terms that initially may appear redundant—*kartā* (creator) and *kārayitā* (instigator)—leading translators to a variety of interpretations. Shastri (1985, p. 414) interprets them respectively as “inaugurator” and “establisher” (“he inaugurates and establishes the social order”), while Raghunathan (1981, p. 420) similarly renders them in paraphrase as “he is the author of the norms of *Dharma*, and is their prop and stay.” The Gita Press version (1992, p. 1234), on the other hand, takes more liberty: “He has fixed the (bounds of propriety) to be observed by the people and has inspired the *Rishis* and others to do so.” The key to correctly distinguishing between *kartā* and *kārayitā*, however, may lie in the interpretation of *maryādānāṃ* (genitive plural of *maryādā*). While “norms of society” is an acceptable translation—and one that certainly does not weaken the argument for Rām as the author of creation—*maryādā* can also be taken

simply to mean “boundaries,” in the broadest sense referring to the relative boundaries of space and time. If we apply this meaning, we can then distinguish, as we shall see, between two subtle distinctions of authorship that may account for the simultaneous use of *kartā* and *kārayitā*.

Maharishi explains that self-referral consciousness, on its most fundamental level, maintains two seemingly contradictory roles: it is the source of creation—the fountainhead of all creative energy and intelligence in the relative field—and also the silent, uninvolved, “non-doer” which manifests creation without changing. Maharishi (1969) uses the following analogy to explain how something can take more than one form without losing its essential character:

Oxygen and hydrogen ions combine to give rise to the properties of water. The water freezes, giving rise to the properties of ice. In these different states of gas, liquid and solid, the basic elements—oxygen and hydrogen—remain the same. In as much as they are the fundamental material from which gas, water and ice are formed, oxygen and hydrogen could be said to have created these different substances. But because they remain oxygen and hydrogen through their various states, they could be said to be non-doing. Such is the state of ultimate Being. Lying at the base of all creation, it is the ‘author’ and, remaining unchanged, it is the ‘non-doer’ and ‘immutable.’ (p. 240)

Using Maharishi’s analogy as a model, *kārayitā* appears to correspond to the creator of the universe, while *kartā* suggests the underlying field of intelligence. While “instigator” is not an elegant translation of *kārayitā*, its causative construction indicates a slightly more active role. The two together, then, appear to identify Rām not only with the creative process, but also with the underlying, non-involved intelligence at its basis.

Maharishi points out that self-referral consciousness is not only the source of creation, but its individual expressions are themselves consciousness. In other words, the entire field of diversity *is* the field of consciousness. Maharishi (1991) explains this relationship between creation and its underlying constituent by means of an analogy:

The sap has all the values of the tender petals. Also it has within the same structure, the value of the prickly thorns. It is the totality that makes the sap the field of all possibilities. It is the sap that pervades every fiber of the plant. Like that is the situation of the ruler of universe; it has to be omnipresent.

Maharishi here compares a plant's sap to the omnipresent field of pure consciousness—just as the sap pervades every fiber of the plant, self-referral consciousness is present in every grain of creation. This intimate relationship between creator and creation is described in the Rāmāyaṇ by the citizens of Ayodhyā who, in a moving sequence, lament Rām's impending exile to the forest:

तस्मात्तस्योपघातेन प्रजाः परमपीडिताः
 औदकानीव सत्त्वानि ग्रीष्मे सलिलसंक्षयात्

*Tasmāt tasyopaghātena prajāḥ parama-pīditāḥ
 audokānīva sattvāni grīṣhme salila-samkṣhayāt*

(Ayodhyā Kāṇḍ, 33.3)

*Therefore, the people are extremely hurt by this
 injury, just as creatures of the sea when the water
 is dried up in the summer.*

The sea simile in this verse presents a view of Rām consonant with Maharishi's analysis of self-referral consciousness and its expressions. Water is the environment in which sea creatures dwell; it surrounds them and forms the basis for their entire reality. In the same way, Rām, the self-referral basis of life, is the environment that gives sustenance to all values of the citizens' lives. Hence, when Rām is banished to the forest, Ayodhyā's citizens feel "dried up," that the basis for their lives is lost. Their expressions are more than praise for a good and noble prince—they are the anguished cries of those cut off from the nourishment of their own Transcendental Consciousness. The next verse expands upon this theme:

पीडया पीडितं सर्वं जगदस्य जगत्पतेः
 मूलस्येवोपघातेन वृक्षः पुष्पफलोपगः

*Pīdayā pīditam sarvaṁ jagad asya jagatpateḥ
 mūlasyevopaghātena vṛikṣhaḥ puṣhpaphalopagaḥ*

(Ayodhyā Kāṇḍ, 33.14)

The entire world is afflicted by the injury to the Lord of the world, just as a tree together with its flowers and fruit is hurt by an injury to its root.

Here Rām—the “ruler of the world”—is likened to a root which gives sustenance to the whole tree, its fruits, and its flowers. Maharishi (1963) often employs the same analogy to express the importance of acting from Transcendental Consciousness:

It is like the process whereby a tree receives water at its root, and consequently all parts of the tree naturally receive nourishment and flourish. No other part of the tree, however, knows or experiences the process of the root receiving the water. Its influence is seen in the increasing freshness of all parts of the tree. (p. 55)

Maharishi’s point is that experiencing self-referral consciousness brings nourishment to every area of life, whether we are aware of it or not (p. 63). Hence, in the above verse the metaphor of the root and tree not only points to Rām as the transcendental source of the world, it also delineates his role as its nourisher; and when that nourishment is cut off from its citizens, they suffer.

The citizens of Ayodhyā continue to exhibit dismay at Rām’s departure in the next verse, in which the parallel is more explicit:

मूलं ह्येषः मनुष्याणां धर्मसारो महाद्युतिः
पुष्पं फलं च पुत्रं च शाखाश्चास्येतरे जनाः

*Mūlaṁ hyeṣaḥ manuṣyāṇāṁ dharmasāro mahādyutiḥ
pushpaṁ phalaṁ cha putraṁ cha śākhāśchāsyetare janāḥ*

(Ayodhyā Kāṇḍ, 33.15)

For he is the essence of Dharma, of extraordinary effulgence, the root of mankind; the other citizens are the flower, fruit, leaf, and branches of him.

This verse reinforces Rām’s status as the source of mankind’s nourishment. In this capacity he is *Dharma-sāra*—the essence of *Dharma*—the

fundamental constituent of the different *Dharmas* (individual, family, social, etc.). The final line of the verse, *pushpaṃ phalaṃ cha putraṃ cha śākhaśchāśyetaṃ janāḥ* (“the other citizens are the flower, fruit, leaf, and branches of him”) brings out an important characteristic of Rām. He is not only the source of creation, he is also the innumerable expressions of self-referral consciousness, in this case embodied by the citizens who see themselves as his “flower, fruit, leaf, and branches.”

While the preceding verses establish Rām as the total potential of natural law, the following emphasizes his role as the source of the individual laws of nature. This verse appears in the *Ayodhyā Kāṇḍ*, in which the counselors of Rām’s father Dasharatha comment on Rām’s divine nature to demonstrate his suitability for kingship:

रामः सत्पुरुषो लोके सत्यधर्मपरायणः
साक्षाद्रामाद्विनिर्वृत्तो धर्मश्चापि श्रिया सह

Rāmaḥ sat puruṣho loke satya-dharma-parāyaṇaḥ
sākṣhād Rāmād vinirvṛitto dharmashchāpi shriyā saha
(*Ayodhyā Kāṇḍ*, 2.29)

*Rām is existence, self-referral consciousness, the supreme
refuge in this world of Dharma and Truth; truly, Dharma,
together with good fortune, proceeds from Rām.*

Of all Rām’s notable qualities cited in this passage, perhaps the most significant is found in the expression *Rāmād vinirvṛitto Dharma* (“Dharma ... proceeds from Rām”). We can take this expression in two ways: first of all, that Rām only speaks and behaves in accord with *Dharma*—an adequate interpretation (in which case satpuruṣa should be taken as a “righteous man”); or secondly, that Rām is the total potential of natural law, the self-referral source of all the individual *Dharmas* upholding life on every level. In the second choice (on which the above translation is based), we find a preferable reading of satpuruṣa by separating an apparent tatpuruṣa into two distinct substantives, sat (“existence”) and Puruṣa (“self-referral consciousness”), here equated with Rām. In this interpretation, Rām is identified as the managing intelligence of

the universe from whom the various laws of nature emerge. While both readings are grammatically correct, we prefer the second, for it describes Rām as the self-referral source of Dharma together with all good fortune and prosperity (*shriyā saha*).

Rām, the embodiment of self-referral consciousness, is not only the source of the universe, he is also the basis of subjective life. His brother Lakshmaṇ brings out this theme in the *Yuddha Kāṇḍ* when he asks:

किमात्मानं महात्मानमात्मानं नावबुध्यसे

Kim ātmānaṁ mahātmānam ātmānaṁ nāvabudhyase

(*Yuddha Kāṇḍ*, 83.43)

How is it that you yourself do not recognize that you are the Self, the Great Self?

Here the repetition of *Ātmā* is significant. The third (Sanskrit) occurrence of *Ātmā* apparently refers to the individual nature of Rām, which Lakshmaṇ identifies with the unbounded Self. Thus, Lakshmaṇ asks, in essence, how it is that Rām does not recognize that his individuality is also the unbounded, eternal *Ātmā*. Lakshmaṇ then identifies both of these with *Mahātmā*, “great Self,” the fully awake Self of the entire creation. In this way he not only affirms Rām’s status as the unbounded Self but also as the Totality, *Brahman*, self-referral consciousness and all of its transformations.

The theme of Rām as the source of individual life is further elucidated in the following verse as the sage Nārada speaks metaphorically of Rām’s universal accessibility:

सर्वदाभिगतः सद्भिः समुद्र इव सिन्धुभिः

Sarvadābhigataḥ sadbhiḥ samudra iva sindhubhiḥ

(*Bāl Kāṇḍ*.1.16)

He is always approached by the wise as is the ocean by the rivers.

We could justifiably take this expression as a tribute to Rām's wisdom, as the wise will naturally seek a great king's advice. But the metaphor of the ocean and the rivers flowing into it appears to suggest a deeper meaning. Self-referral consciousness is the unified source of all individual life, and one could envision its individual expressions emerging from it like so many streams from an ocean. However, this verse depicts rivers approaching the ocean, reminiscent of individuals practicing the Transcendental Meditation technique, who return to the unified source of their own lives.¹⁷ The verse further indicates that it is the wise who approach the ocean (Rām), for it is the wise who understand the true goal of life and seek to discover it.

We can take this interpretation one more step and apply the ocean/river metaphor to Maharishi's explanation of the growth to higher states of consciousness. In progressing toward the supreme unfoldment of Unity Consciousness one in effect approaches Rām, the embodiment of Totality, as a river flows into an ocean.

The preceding verses have enabled us to better understand Rām's status as the embodiment of *Dharma*. The following section will explore the significance of Rām as the King of Ayodhyā. We will see that with Rām as king, *Dharma* becomes fully lively in the collective consciousness, and an ideal society ensues.

The Maharishi Effect in the Rāmāyaṇ

The *Aranya Kāṇḍ* contains an important, though little noted, passage that provides insight into the mechanics underlying Ayodhyā's ideal society during Rām's reign. In this selection of verses, a spontaneous transformation of evil forest creatures into more harmonious, more life-supporting beings takes place simply from the presence of the enlightened sage Agastya:

यदाप्रभृति चाक्रान्ता दिगियं पुण्यकर्मणा
तदाप्रभृति निर्वैराः प्रशान्ता रजनीचराः

¹⁷ In his description of the Transcendental Meditation technique Maharishi (1995b, p. 280) notes: "This process can be likened to a river which naturally and effortlessly flows into the ocean and gains the status of the ocean."

*Yadāprabhṛiti chākrāntā dig iyaṃ puṇya-karmaṇā
tadāprabhṛiti nirvairāḥ prashāntā rajanīcharāḥ*

(Aranya Kāṇḍ, 11.83)

*From the moment that this virtuous sage arrived in this
area, the evil creatures have become peaceful and free of
hostility.*

Agastya's effect on the forest dwellers comes neither from his good intentions nor his actions; rather he pacifies the evil creatures merely through his vicinity. His coherent consciousness gives the sinful no choice but to change or depart:

नात्र जीवेन्मृषावादी क्रूरो वा यदि वा शठः
नृशंसः पापवृत्तो वा मुनिरेष तथाविधः

*Nātra jīven mṛishāvādī krūro vā yadi vā shathah
nṛishamsaḥ pāpavṛitto vā munir esha tathāvidhaḥ*

(Aranya Kāṇḍ, 11.90)

*This sage is of such a nature that a liar, a cruel person, a
thief, or a sinner cannot live in this area.*

These verses suggest that when individuals such as Agastya are fully established in self-referral consciousness, they naturally create greater harmony and orderliness around them. However, Maharishi explains that this same outcome can be created by many individuals experiencing self-referral consciousness in their daily practice of the Transcendental Meditation technique and the collective practice of the TM-Sidhi program. This effect, termed the *Maharishi Effect* after its founder, relies on the phenomenon of *collective consciousness*. To fully appreciate the significance of these verses, as well as to better understand Maharishi's exposition of how to bring life into accord with natural law, it will be useful to examine Maharishi's discussion of collective consciousness and the *Maharishi Effect*.

Maharishi (1978) describes collective consciousness as the wholeness of consciousness of any specific group: “when we talk of community consciousness, we merely put together the consciousness of all the individuals who make up the community, or the nation” (p. 87). By community Maharishi refers to any specific group, and while there are innumerable divisions and organizations of collective consciousness, he notes seven that are principal: family consciousness, community consciousness, city consciousness, state or provincial consciousness, national consciousness, world consciousness, and universal consciousness, each created by its component individuals (World Government News, no. 10, October, 1978, p. 3).

Maharishi’s account of collective consciousness may first appear unusual unless we understand consciousness as a *field* as described by modern science. Physicists delineate a variety of infinite, unbounded, and all pervasive fields that operate invisibly throughout creation governing the activities of innumerable laws of nature. For example, the electromagnetic field—one of the four principal force fields—permeates the entire universe, and enables radio and television transmitters to send signals by creating waves within the field. While the waves are unseen, they nonetheless create effects with which we are all familiar—the sounds and images of radio and television.

Likewise, the other three fundamental force fields—gravitation, weak interaction, and strong interaction—also pervade everything and behave invisibly throughout nature. Maharishi holds that self-referral consciousness also operates as a field, though on an even more fundamental level; it is the omnipresent, invisible, and unbounded field from which all force and matter fields emerge. Just as a radio transmitter can create waves in the electromagnetic field, individuals constantly create influences on all parts of creation simply because consciousness permeates every aspect of the material world. Maharishi (1963) frequently employs an analogy to explain this point:

If a stone is thrown into a pond, waves are produced that travel throughout the pond. Every wave produces effects in every part of the pond, resulting in some influence or other. Similarly, the wave of individual life through its activity produces an influence in all fields of the cosmos. (p. 69)

Similarly, the direct experience of self-referral consciousness influences every aspect of the universe, enlivening it with the perfect order and harmony inherent in its structure. Moreover, groups of individuals also can create very powerful effects in the environment through their collective practice of the Transcendental Meditation and TM-Sidhi programs.

Essential to this discussion of collective consciousness is its relationship to individual consciousness. Maharishi (1976) explains that “as individual consciousness grows, collective consciousness rises; and as collective consciousness rises, individual consciousness grows” (p. 124). In other words, as an individual regularly experiences self-referral consciousness and enlivens it in the awareness, the levels of collective consciousness in which the person participates—family, city, province, etc.—are simultaneously improved. This higher value of collective consciousness in turn affects every individual who comprises it. Individual consciousness is thus the basis of all levels of collective consciousness, influencing them and in turn being influenced by them (p. 124).

Since individual and collective consciousness maintain a reciprocal relationship, it stands to reason that a large number of individuals practicing the Transcendental Meditation program will bring a powerful influence of orderliness and harmony to collective consciousness, enabling an entire population to act more coherently. In 1962, in fact, Maharishi (Maharishi Vedic University Press, 1986) predicted significant improvements in the quality of life in any population in which a small percent practiced the Transcendental Meditation technique:

My calculation is that the day one-tenth of the adult population of the world begins to meditate a half-hour morning and evening and begins to emit an influence of peace and harmony from the deepest level of consciousness—from that day, the atmosphere of the world, this negative atmosphere of the world, will be neutralized, and from that day will dawn the chance of no war for centuries to come. (p. 430)

Maharishi (p. 430) later noted that one percent of the adult population would be enough, but that he had indicated ten percent “for safety factor” (p. 430). He added that the requirement for improving the quality of life in society is small because the influence from the level of pure consciousness is much more powerful than from the conscious level (p. 430).

The figure of one percent has since become the basis for research into Maharishi's prediction.

In 1976, however, after introducing the advanced TM-Sidhi program, including *Yogic Flying*, Maharishi predicted that only the square root of one percent of a population practicing this more powerful technology in a group was necessary to create World Peace.¹⁸ The introduction of this program has provided greater opportunities for empirically verifying Maharishi's prediction, for experts in the Transcendental Meditation and TM-Sidhi programs periodically assemble in large groups to create the extended *Maharishi Effect*. The results of this collective practice have been documented on every level of society, including city life (Lanford, 1984, pp. 2600-2608), state and provincial life (Reeks, 1990), national life (Burgmans et al, 1983, pp. 2566-2582), the life of neighboring countries (Cavanaugh, 1987, pp. 799-804), of international life (Gelderloos et al., 1988, pp. 80-94), and global life (Orme-Johnson et al, 1987, pp. 2730-2762).

We can now see that Agastya's influence on his environment can be clearly explained through the scientific principle of the *Maharishi Effect*. While the effect is generally produced by many individuals experiencing self-referral consciousness during their Transcendental Meditation and TM-Sidhi practice, in the case of Agastya it is created because he is an enlightened sage, permanently established in self-referral consciousness; he thus naturally and automatically brings the total potential of natural law to collective consciousness.

With this understanding of group consciousness and the *Maharishi Effect*, we will see in the following section how the enlivenment of the total potential of natural law in the collective consciousness of the citizens of Ayodhyā, through the sovereignty of Rām, created an ideal society.

Society in Accord with *Dharma*

In the Rāmāyaṇ, Rām defeats Rāvaṇ and his armies in battle, frees his wife Sītā, and triumphantly returns to Ayodhyā where he rules for many

¹⁸ The square root of one percent was based on the observation that other coherent systems (such as laser beams and superconductors) rely on the coherence of the square root of one percent of their constituent elements (electrons in the case of a laser beam or superconductor) in order to create more order in the entire system.

years. The Rāmāyaṇ relates that during his long reign, the entire society lived fully in accord with *Dharma*, experienced great happiness and fulfillment, and enjoyed the absence of crime and disease. Maharishi also speaks of the potential for an ideal society in perfect accord with natural law, characterized by unlimited progress, success, and freedom from weakness of any kind, a description remarkably similar to Rām's reign in the Rāmāyaṇ.

This view of a perfect society is not surprising in light of Maharishi's explanation of the total potential of individual life. Certainly a society in which the individuals live perfection will be ideal, but Maharishi's explanation of collective consciousness provides a vision of ideal life for everyone even when only a small number are coherent and harmonious. Maharishi (1988) refers to such a society as Heaven on Earth:

In one expression, Heaven on Earth will be characterized by all good everywhere and non-good nowhere. What is Heaven on Earth? It is perfect health, a perfect way of thinking, a perfect way of doing. A perfect way of thinking means every thought will be appropriate for the thinker and his surroundings, and appropriate thought results in appropriate action and appropriate behavior. (p. 1)

In Maharishi's analysis, Heaven on Earth is more than an intellectually derived ideal because the technology necessary to bring it to fruition is presently available in the technologies of his Vedic Science. He emphasizes that these technologies will enable the whole of mankind to think and act spontaneously in accord with natural law, and that "when thinking is always spontaneously evolutionary then there is Heaven for everyone (p. 1)."

Contemporary interpretations of the Rāmāyaṇ assume that Rām's skill and charisma are the factors that restore Ayodhyā to a better civilization; they hold that the depictions of perfect life during his reign are hyperbolic, added simply to provide poetic flair. Maharishi, however, takes these accounts literally, explaining that in Ayodhyā the total potential of natural law was restored to the collective consciousness in the person of Lord Rām, and the removal of stress and negativity from the collective consciousness resulted from the destruction of Rāvaṇ.

Our first example of Ayodhyā as an ideal society is a general one, which describes life in accord with *Dharma*:

सर्वं मुदितमेवासीत्सर्वो धर्मपरोऽभवत्
राममेवानुपष्यन्तो नाभ्यहिंसन्परस्परम्

*Sarvaṃ muditam evāsit sarvo dharma-paro 'bhavat
Rāmam evānupashyanto nābhyahiṃsan parasparam*

(Yuddha Kāṇḍ, 131.100)

*Happiness was universal, and everyone was established in
Dharma. Seeing Rām alone, they did not harm each other.*

In addition to avowing that Ayodhyā's citizens were established in *Dharma*, this verse makes the remarkable assertion that merely the sight of Rām sufficiently deterred criminal behavior. Maharishi (1995b) depicts Rām as the embodiment of natural law (p. 36) and, therefore, “seeing Rām alone” appears to describe the direct experience of self-referral consciousness. In this view, the verse may also imply the phenomenon of spontaneous right action resulting from the experience of self-referral consciousness. The employment of the enclitic particle *eva*, which generally places emphasis on the preceding word, suggests that *only* the experience of Rām (*Rāmam eva*) is necessary to rise above the desire to cause harm.

The following verse indicates that all criminal activity in Ayodhyā completely ceased during Rām's rule.¹⁹

निर्दस्युरभवल्लोको नानर्थः कंचिदस्पृशत्

Nirdasyur abhaval loko nānarthah kaṃchid asprishat

(Yuddha Kāṇḍ, 131.99)

The world had no robbers nor did anyone suffer harm.

It is interesting that *nānarthah kaṃchid asprishat* (“nor did anyone suffer harm”) can also be read as “no one performed useless (action).”²⁰ In this

¹⁹ In Maharishi's view all violation of natural law is criminal behavior—the “hardened” criminal merely violates natural law more severely.

²⁰ *Anartha*—*an* + *artha*—is more commonly translated “worthless.”

interpretation, the citizens' lives were not only free of criminal behavior, they were always purposeful, always efficient, and always aimed toward greater achievement and fulfillment. Regardless of interpretation, however, the overall sense is essentially the same—the people of Ayodhyā acted without mistakes, illustrating Maharishi's explanation that life in accord with natural law is perfectly correct, always evolutionary.

The celestial sage Nārada also discusses the reign of Rām in the opening sarga of the Rāmāyaṇ:

चतुर्वर्ण्यं च लोकेऽस्मिन्स्वे स्वे धर्मे नियोक्ष्यति

Chaturvarṇyaṃ cha loke 'smin swe swe dharme niyokshyati

(*Bāl Kāṇḍ*, 1.96)

Each member of the fourfold order will be enjoined in their own Dharma.

This verse presents an important element of the Rāmāyaṇ's teaching on *Dharma*, unavailable without Maharishi's commentary. Here we find that every individual was "enjoined" to act in accord with *Dharma*, but in a later verse (*Yuddha Kāṇḍ*, 131.100) they are said to be fulfilled in their *Dharma*. It is difficult, as we know, to coerce or enjoin citizens in any land and expect them to remain fulfilled; thus it is unlikely that the citizens of Ayodhyā would have remained fulfilled had they been pressured against their will. Maharishi's (1994) commentary on natural law resolves this seeming incongruity; he explains that the functioning of self-referral consciousness *is* the functioning of natural law in its most settled state. When the conscious human mind identifies itself with this level of nature's functioning, it gains the ability to perform in the style with which nature performs (pp. 108–153). When this value of natural law became lively in the collective consciousness of Ayodhyā after the return of Rām, all the citizens spontaneously lived in accord with natural law; that is, they were "enjoined" by the natural force of evolution to live in their own *Dharma*, thus promoting their own happiness and welfare as well as that of society.

The following verse also presents this theme of fulfillment in the performance of *Dharma*:

ब्राह्मणाः क्षत्रिया वैश्याः शूद्रा लोभविवर्जिताः
स्वकर्मसु प्रवर्तन्ते तुष्टाः स्वैरेव कर्मभिः

*Brāhmaṇāḥ kshatriyā vaiśhyāḥ shūdrā lobha-vivarjitāḥ
swakarmasu pravartante tushtāḥ svair eva karmabhiḥ*

(*Yuddha Kāṇḍ*, 131.104)

*Brāhmanas, Kshatriyas, Vaishyas, and Shūdras, bereft of
greed, performed their own duties and were fulfilled in
their own activity.*

This verse explains that the members of Ayodhyā's different castes (*Brāhmanas*, *Kshatriyas*, *Vaishyas*, and *Shūdras*) had their own social responsibilities that both upheld the *Dharma* of society and effectively supported their own evolution. This verse refutes any assertion of coercion or force, for it clearly indicates that Ayodhyā's citizens were fulfilled in performing their *Dharmas*.

An additional verse illustrates that even small violations of natural law, such as the telling of lies, were in abeyance:

आसन्प्रजा धर्मरता रामे शासति नानृताः
सर्वे लक्षणसम्पन्नाः सर्वे धर्मपरायणाः

*āsan prajā dharma-ratā Rāme shāsati nānṛitāḥ
sarve lakṣhaṇa-sampannāḥ sarve dharma-parāyaṇāḥ*

(*Yuddha Kāṇḍ*, 131.105)

*So long as Rām ruled, the people were devoted to Dharma
and never told lies. All were endowed with auspicious
marks and all were established in Dharma.*

Similarly, Ayodhyā was free of sickness and natural catastrophes:

नाकाले म्रियते कश्चिन्न व्याधि प्राणिनां तथा
नानर्थो विद्यते कश्चिद्रामे राज्यं प्रशासति

*Nākāle mriyate kashchin na vyādhi prāṇinām tathā
nānartho vidyate kashchid Rāme rājyaṃ prashāsati*

(Uttar Kāṇḍ, 99.14)

*During the reign of Rām, no one died prematurely, no one
suffered from disease, and there were no calamities.*

This verse not only documents the absence of sickness, but points to the prevalence of long and healthy life spans during Rām's reign; it provides the vision of an ideal society founded in perfect health, a model of perfect life for all mankind in all ages.

In these descriptions of Ayodhyā during Rām's reign, we not only see among the people a profound state of happiness and fulfillment, we find the growth of balance in all areas of life including the environment. For example, the Rāmāyaṇ clearly connects the reign of Rām with the growth of balance in nature in the following descriptions:

नित्यपुष्पा नित्यफलास्तरवः स्कन्धविस्तृताः
काले वर्षी च पर्जन्यः सुखस्पर्शश्च मारुतः

*Nitya-pushpā nitya-phalāstaravaḥ skandha-vistṛitāḥ
kāle varshī cha Parjanyaḥ sukha-sparshaś cha Mārutaḥ*

(Yuddha Kāṇḍ, 131.103)

*There (in Ayodhyā) the trees with outstretched branches
were always in blossom, always laden with fruits; the rains
came on time and the winds were pleasant to the touch.*

काले वर्षति पर्जन्यः सुभिन्नं विमला दिशः
हृष्टपुष्टजनाकीर्णं पुरं जनपदास्तथा

*Kāle varshati Parjanyaḥ subhikshaṃ vimalā dishaḥ
hṛishta-pushta-janākīrṇaṃ puram janapadās tathā*

(Uttar Kāṇḍ, 99.13)

*The rains came on time, and the skies were clear; the city
and provinces were in abundance of food, and filled with
happy, fulfilled citizens.*

These verses describe the coordination of components of life ordinarily considered beyond human control, such as the weather and seasonal variations; farmers in this age, for example, annually face the seeming vagaries of weather, never knowing if the current year will bring beneficial or disastrous environmental conditions for their crops. Maharishi (1978) points out that when the sunshine, rain, and seasons come and go without reference to the needs of society it is because the environment subsists in a state of imbalance, in which there is a lack of coordination among the various separate elements (p. 183). He emphasizes, however, that these seemingly separate entities can be properly coordinated by reestablishing balance.

The possibility of restoring nature's balance is in itself an astonishing concept. Maharishi emphasizes, however, that the environment can indeed be influenced by human beings, for its basis is, as we've seen, the same field of natural law that is the simplest form of human awareness. His commentary begins with the experience of the unified field of pure consciousness during the Transcendental Meditation program:

When the awareness expands it does not become fragmented. Instead it becomes more and more coherent. That means that the extremities of infinity are brought inwards, to togetherness. The unboundedness of life is brought into one complete, unchanging wholeness . . . When an infinite number of small and separate channels of creativity are put together in one whole, creativity is infinite. (pp. 182-183)

Maharishi (1963) often compares the mind to a wave on the ocean as an analogy to describe the process of transcending. Just as a wave settles

down to assume the status of the entire ocean, the mind settles during the Transcendental Meditation technique and identifies itself with its simplest state, pure self-referral consciousness (p. 26). This analogy reveals several characteristics of self-referral consciousness, but it particularly underscores its status as a field of Unity, the unbounded totality of all separate parts. On this level of Unity, Maharishi (1978) notes, all of the various elements of nature are naturally coordinated, a concept he calls “infinite correlation”:

Infinite correlation means perfect communication. In other words, each element is related with the other so intimately, that it is the other. That is the wealth of the wholeness of awareness which unifies all surface differences at the source. (p. 183)

By enlivening the quality of infinite correlation in individual awareness, it is simultaneously enlivened in every part of collective life:

Through the Transcendental Meditation 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. (p. 184)

Here Maharishi makes clear that national life includes much more than just the lives of the citizens. Creating coherence in the collective consciousness not only creates balance in the functioning of the sun, wind, and rain, but also in every part of a nation. Hence, the key to creating more orderly and coherent functioning among all of the parts of the environment is to enliven the quality of infinite correlation in the collective consciousness.

The verses cited above accentuate the balanced state of life in Ayodhyā, where food was plentiful and beauty was everywhere. We see from Maharishi’s analysis of environmental balance a theoretical framework that places Vālmīki’s descriptions in a thoroughly practical context. In the case of Ayodhyā, balance was created in national consciousness through the presence of Rām, the total potential of natural law. And we see from Maharishi’s exposition on the relationship between individual life, collective life, and the environment how this ideal—a mistake-free life in perfect accord with natural law—is a prac-

tical reality, obtainable through the implementation of the technologies of consciousness, particularly the group practice of the TM-Sidhi program.

Conclusion

This paper has examined key verses from the Vālmīki Rāmāyaṇ in the light of the principles of Maharishi Vedic Science and Technology. It has demonstrated how Maharishi Vedic Science enables a reader to gain a deeper appreciation of the role of *Dharma* in the Rāmāyaṇ. It has cited descriptions of *Dharma* that locate its most fundamental value as the transcendental basis of the entire universe, as well as the inner nature—the Self—of all creatures. It has also located evidence that, in the view of the Rāmāyaṇ, the key to living a life in accord with *Dharma* is not just to look toward social norms and conventions, but to develop the total potential of life, and thereby spontaneously act in accord with natural law. Although there are numerous discussions of specific behaviors throughout the text, we have seen that the wise attended to their own enlightenment in order to live in accord with *Dharma*.

This paper has further examined Maharishi's description of Rām as the embodiment of natural law, and found evidence throughout the Rāmāyaṇ that indeed Rām is fully awake self-referral consciousness, the administrator of the universe, the embodiment of *Dharma*. Selected passages portray Rām as capable of creating, maintaining, and dissolving the entire universe; others characterize him as the essence of *Dharma*, from whom all *Dharmas* (the individual laws of nature) emerge. Moreover, we have seen Rām's rule as the basis for many years of ideal life, in which every individual lived a fulfilled and prosperous existence.

In conclusion we may reflect on the more profound understanding of the Rāmāyaṇ that Maharishi Vedic Science and Technology has afforded us. Without the complete knowledge of how individual and collective life can be unfolded, it is not surprising that modern scholars see descriptions of life in Ayodhyā as fantastic. A world where the beauty and order of nature always flourishes, where fruits and flowers are readily available, where rains come on time, and where famine and hardship are non-existent, is difficult for the modern world to imagine. Maharishi, however, takes this description of Ayodhyā from the Rāmāyaṇ as an historical portrayal of ideal life, and offers a compelling

supportive system of knowledge. He (1995b) further explains that the rule of Rām, राम राज *Rām Rāj*, can be the reality for any nation in any age:

A ruler of a territory may be anyone in the infinity of time, but if he aligns his awareness with *Purushottam* [Rām, *Brahm*], his administration will inherit the qualities of order, freedom, bliss, and the ability to nourish all.

Such an Administration is called *Rām Rāj*—the rule of Rām—the administration of the ruler Rām, Purushottam Rām. (p. 43)

Maharishi has offered to the world a time-tested and scientifically validated technology that can create a civilization on par with ancient Ayodhyā. While many scientific studies uphold Maharishi's comments, the ancient literature of the Vedic Tradition provides even more support. Maharishi Vedic Science, modern science, and the texts of the ancient Vedic literature have all located a similar conclusion: that a perfect life in complete accord with natural law—Heaven on Earth—is indeed possible for every individual and every society. It is now up to the leaders of this generation to answer Maharishi's call and quickly bring the world to a new civilization based on the infinite possibilities inherent in the very nature of life.

Works Cited

- Aiyar, R. N. *Shrimadvālmīkirāmāyaṇam*. Madras: M.L.J. Press, 1958.
- Alexander, C. N. & Boyer, R.W. "Seven States of Consciousness: Unfolding the Full Potential of the Cosmic Psyche in Individual Life through Maharishi's Vedic Psychology. *Modern Science and Vedic Science*, 2(4), 1989, 324-371.
- Bhatt, G.H., and Shah, U.P. (general editors). *The Vālmiki Rāmāyaṇa: Critical Edition*. Baroda: Oriental Institute, 1975.
- Bulcke, C. "The Rāmāyaṇa: Its History and Character." PO Vol. XXV (Jan.-Oct.), 1960, 36-66.
- Burgmans, W., Burgt, A., Langenkamp, F., & Verstegen, J. "Sociological Effects of the Group Dynamics of Consciousness: Decrease of Crime and Traffic Accidents in Holland." In R.A. Chalmers, G. Clements, H. Schenkluhn, & M. Weinless (Eds.), *Scientific Research on the Transcendental Meditation and TM-Sidhi Programme: Collected Papers, Vol. 4*, 1983, 2566-2582.
- Cavanaugh, K. L. "Time series analysis of U.S. and Canadian Inflation and Unemployment: A Test of a Field-Theoretic Hypothesis." *Proceedings of the American Statistical Association, Business and Economics Statistics Section*, 1987, 799-804.
- Dillbeck, M. C., Cavanaugh, K. L., Glenn, T., Orme-Johnson, D. W., & Mittlefehldt V. "Consciousness as a Field: The Transcendental Meditation and TM-Sidhi Program and Changes in Social Indicators." *The Journal of Mind and Behavior*, 8, 1987, 67-104.
- Gelderloos, P., Frid, J.F., Goddard, P. H., Xue, X., & Lölinger, S. "Creating World Peace through the Collective Practice of the Maharishi Technology of the Unified Field: Improved U.S.-Soviet Relations." *Social Science Perspectives Journal*, 2 (4), 1988, 80-94.
- Gelderloos, P. & van den Berg, W. "Maharishi's TM-Sidhi program: Participating in the Infinite Creativity of nature to Enliven the Totality of the Cosmic Psyche in All Aspects of Life." *Modern Science and Vedic Science*, 2(4), 1989, 324-371.
- His Holiness Maharishi Mahesh Yogi—Thirty Years Around the World: Dawn of the Age of Enlightenment, Vol. 1*. The Netherlands: Maharishi Vedic University Press, 1986.

- Jacobi, H. *Das Rāmāyaṇa: Geschichte und Inhalt, nebst Concordanz der Gedrckten Recensionen*. Bonn: Friederich Cohen, 1893.
- Khan, B. *The Concept of Dharma in Valmiki Ramayana*. New Delhi: Munshiram Manoharlal, 1965.
- Lanford, A. G. "Reduction in homicide in Washington, D.C. through the Maharishi Technology of the Unified Field, 1980-1983: A Time Series Analysis." In R.A. Chalmers, G. Clements, H. Schenkluhn, & M. Weinless (Eds.), *Scientific Research on the Transcendental Meditation and TM-Sidhi Programme: Collected Papers, Vol. 4*, 1984, 2600-2608.
- The Mahābhārata with the Bharata Bhawadeepa Commentary of Nilkaṇṭha*. Pandit Ramachandra Kinjawadekar (Ed.), New Delhi, India: Munshiram Manoharlal, 1979.
- Maharishi Mahesh Yogi. (1963). *The Science of Being and Art of Living*. USA: Age of Enlightenment Publications.
- Maharishi Mahesh Yogi. *Maharishi Mahesh Yogi on the Bhagavad Gita: A New Translation and Commentary, Chapters 1-6*. Baltimore, Penguin, 1969.
- Maharishi Mahesh Yogi. *Patanjali and the Eight Limbs of Yoga*. [Video-taped Lecture, 18, August, 1971, Humboldt State College, Arcata, CA].
- Maharishi Mahesh Yogi. *Creating an Ideal Society*. Rheinweiler, W. Germany: Maharishi European University Press, 1976.
- Maharishi Mahesh Yogi. *First World Assembly on Law, Justice and Rehabilitation, Conference Proceedings*. International Capital of the Age of Enlightenment, Seelisberg, Switzerland, 1977.
- Maharishi Mahesh Yogi. *Enlightenment and Invincibility*. Rheinweiler, W. Germany: MERU Press, 1978.
- Maharishi Mahesh Yogi. *Maharishi's Master Plan to Create Heaven on Earth*. Washington, DC: Age of Enlightenment Press, 1988.
- Maharishi Mahesh Yogi. "Maharishi Inaugurates Master Plan to Create Heaven on Earth." *Age of Enlightenment News*, Summer, 1988.
- Maharishi Mahesh Yogi. *Maharishi's Call on Victory Day: Continental Assembly on World Peace and Perfect Health*. [Audiotaped Lecture, 18, October, 1991, Fairfield, IA, USA].
- Maharishi Mahesh Yogi. *Maharishi University of Management: Wholeness on the Move*. India: Maharishi Prakashan, 1995a.

- Maharishi Mahesh Yogi. *Maharishi's Absolute Theory of Government: Automation in Administration*. India: Maharishi Prakashan, 1995b.
- Maharishi Mahesh Yogi. *Maharishi Forum of Natural Law and National Law for Doctors*, India: Maharishi Vedic University, 1995c.
- Maharishi Vedic University, *Maharishi Vedic University Exhibition*. The Netherlands: Maharishi Vedic University Press, 1993.
- Monier-Williams, M. *Sanskrit English Dictionary*. Delhi: Motilal Banarsidass, 1984.
- Orme-Johnson, D. W., Cavanaugh, K. L., Alexander, C. N., Gelderloos, P., Dillbeck, M. C., Lanford, A. G., & Abou Nader, T. M. "The Influence of the Maharishi Technology of the Unified Field on World Events and Global Social Indicators: The Effects of the Taste of Utopia Assembly." In R.A. Chalmers, G. Clements, H. Schenkluhn, & M. Weinless (Eds.), *Scientific Research on the Transcendental Meditation and TM-Sidhi Programme: Collected Papers, Vol. 4*, 1987, 2730-2762.
- Orme-Johnson, D. W., Dillbeck, M. C., Bousquet, J. G., & Alexander, C. N. "The World Peace Project of 1978: An Experimental Analysis of Achieving World Peace through the Maharishi Technology of the Unified Field (Maharishi European Research University, Research Report No. 322), 1985. In R.A. Chalmers, G. Clements, H. Schenkluhn, & M. Weinless (Eds.), *Scientific Research on the Transcendental Meditation and TM-Sidhi Programme: Collected Papers, Vol. 4*, pp. 2532-2548.
- Pollock, S. I. Trans. *The Rāmāyaṇa of Vālmiki: An Epic of Ancient India, Vol. 3. Aranyakāṇḍa*. Edited by Robert Goldman. Introduction and annotation by Sheldon Pollock. Princeton: Princeton University Press, 1991.
- Raghunathan, N., Trans. *Srimad Vālmiki Ramayana*. Madras, India: Vighnesvara Publishing House, 1981.
- The Rāmāyaṇa of Vālmiki: An Epic of Ancient India. Volume 1, Bālakāṇḍa*. Ed. and Introduction by Robert P. Goldman. Princeton University Press: Princeton, New Jersey, 1984.
- Reeks, D. "Improved Quality of Life in Iowa through the Maharishi Effect." Diss. Maharishi International University, 1990.

- Sands, W. F. "Maharishi's Absolute Theory of Government in the Vālmīki Rāmāyana." Diss. Maharishi International University, 1994.
- Shastri, H. P. *The Rāmāyaṇa of Vālmīki*. London, England: Shanti Sadan, 1985.
- Śrīmad Devī Bhāgavatam*. Trans. Swami Vijnānanda. New Delhi: Munshiram Manoharlal, 1992.
- Śrīmad Vālmīki-Rāmāyaṇa*, Gītā Press: Gorakhpur, India, 1992.
- World Government News. Issue no. 10, October, 1978. International Association for the Advancement of the Science of Creative Intelligence.

This article, "Dharma in the Vālmīki Rāmāyaṇ In the Light of Maharishi Vedic Science and Technology," by William F. Sands, Ph.D., here revised/updated, and reprinted with permission, was accepted as part of his dissertation for a Ph.D. in Maharishi Vedic Science at Maharishi University of Management.

**Free Will, Determinism,
and *Maharishi Jyotish***

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ABSTRACT

Intuitively, the ability of Maharishi Jyotish (Vedic astrology) to predict the future seems at odds with the idea of freedom of action in life (free will). In his Vedic Science, however, Maharishi upholds both principles as characterizing both cosmic and individual evolution. Maharishi Jyotish is the science of karma; based on the principle of 'as you sow, so shall you reap,' it calculates the situations and circumstances one will face in life as a result of past action, which are determined by natural law. Maharishi explains that how one interacts with these situations and circumstances is a function of the degree of one's creative intelligence; the more creative intelligence one brings, the greater the freedom to interact with any situation or circumstance in a way that promotes maximum evolution. Practice of the Transcendental Meditation and TM-Sidhi program, therefore, promotes evolution through developing strong free will.

Introduction

The underlying principle of Maharishi Jyotish is that creation unfolds in a perfect sequence; evolution proceeds under the direction of laws of nature that operate in an innocent and completely set fashion. As meteorology has amply demonstrated, this set sequence allows calculation of the future. Maharishi uses the analogy of a production line to illustrate this principle. If you know one point in a production line, you can calculate what came before and what will come after. Thus, on the one hand we have something about the future which is completely set and predictable, that is, determined.

On the other hand, there are numerous instances, particularly in Maharishi's commentary on Chapter 1, verse 1 of the Bhagavad-Gita, where he clearly explains that man has free will, or freedom of action. "Man's life is so highly evolved that he enjoys freedom of action in nature. This enables him to live in any way he desires, either for good or for evil" (1969, p. 27)."

The juxtaposition of these two perspectives naturally gives rise to a set of questions: (1) If evolution is completely set according to the sequential unfoldment of natural law, is not the future completely determined? (2) If evolution is completely determined, in what sense could

man have free will? Or looking at it from the perspective of free will: (1) If we claim man has free will, how is it we can say that everything is completely determined? (2) If everything is *not* completely determined, then how can Maharishi Jyotish possibly predict the future accurately?

This article will present Maharishi's answers to these questions. We will begin by presenting Maharishi's definition of free will and determinism and his discussion of the relationship between these two concepts. And then this general understanding will be applied to the more specific context of Maharishi Jyotish.

Free Will and Determinism

Free will and science

On July 24, 1971, during one of the first symposia on the Science of Creative Intelligence in Amherst, Massachusetts, Maharishi responded to a philosopher's presentation on moral action with a beautiful summary of his teaching on free will and determinism. Since the advent of the scientific age, this topic has been thorny for philosophers who subscribe to the belief that man's subjective experiences can be completely explained as by-products of physiological activity. That is, the belief that people do not have minds as such, they only have brains: What we experience subjectively as thoughts and the sensation of being in control of our actions, can be completely reduced, and therefore explained, in terms of the functioning of brain cells. Paul Churchland, a prominent writer in this area, summarizes this understanding as follows:

Mental states *are* physical states of the brain. That is, each type of mental state or process is *numerically identical with* (is one and the very same thing as) some type of physical state or process within the brain or central nervous system. (1988, p. 26)

For scientists and philosophers who subscribe to this understanding, to say thoughts can be completely explained by physiological causes is equal to saying they are completely determined. This understanding eliminates free will from human action.

In Maharishi Vedic Science, the b

rain, although playing a crucial role in the functioning of the mind, is not equivalent to the mind. The mind exists in its own integrity as vibrating consciousness or creative intelligence, whose experience is supported by the functioning of the nervous system, including the brain physiology. In normal waking state experience, the mind and brain maintain a mutually interdependent relationship: mind can influence how the brain functions and vice versa. Maharishi illustrates this relationship with examples like the bio-chemical and electrical changes that would likely occur in the brain if a person was notified of winning the lottery (mind influencing brain) or, on the other hand, the subjective experiences that can be induced through the ingestion of various drugs (brain influencing mind).

Because the mind is not completely dependent on the brain, free will can be a quality that enters our lives through the functioning of creative intelligence. Maharishi in fact ascribes freedom as a quality of the field of Being—the field of pure consciousness or pure creative intelligence (1963, p. 236). This freedom quality of the pure consciousness expresses itself in human thought and action as free will.

Cosmic and individual perspectives on free will and determinism

In his Amherst talk Maharishi clarified that free will can only be properly understood in the context of the role of natural law in the evolution of creation. The purpose of all the laws of nature is to regulate progress in life—to promote evolution and ultimately bring all life to fulfillment through evolution.

The purpose of creation is the expansion of happiness, and this purpose is fulfilled through the process of cosmic evolution. The significance and purpose of individual life is the same as that of cosmic life. The difference is one of scale. (Maharishi, 1963, p. 64)

Thus, in Maharishi Vedic Science, evolution has a specific goal and purpose. That is, the end-point of evolution, from the cosmic perspective, is determined. From the cosmic perspective, the perspective of cosmic creative intelligence, it is determined that everyone will enjoy that ultimate fulfillment of enlightenment.

In the above passage from the *Science of Being*, Maharishi notes that while individual and cosmic life share the same purpose, and are to that extent therefore determined, man's evolution is on a different scale than that of the universe. It is on this individual scale that free will operates. On the cosmic scale our ultimate fulfillment is secured. On the individual scale, what is not determined within this context is the time frame—how quickly one will attain this enlightened state. Depending on man's free actions, it could be more or less quickly. In his talk at Amherst, Maharishi integrated the cosmic and individual perspective by first noting that "life is determined to be in freedom and fulfillment." He continues, however, by indicating that

Whether a man is lazy on account of his faith in determinism, or he is dynamic on account of his faith in indeterminism—progress is determined for all. It is a matter of less speedy progress or more speedy progress. (1971a)

It is this principle of speed which is at the core of free will and determinism with respect to the individual. The individual is set in a cosmic context which is determined. But within this context he can use his free will to either hasten or impair his speed of evolution. Thus one answer to the questions raised in the introduction is that free will and determinism coexist—it is a matter of whether we are emphasizing the cosmic or individual perspective.

Weak and strong free will

Having established the importance of man's free action for determining the speed of evolution, another important principle that Maharishi (1971a) brought to light in his Amherst talk was that fact that in the waking state free will is not an absolute quality. Free will can be either weak or strong:

Weak life—weak free will—will be trapped into determinism to such an extent that it will be very difficult for the free aspect of will to operate in any sense. And a strong free will makes use of determinism. A strong free will, a developed creative intelligence, sees that fulfillment is predetermined for every human being. This human nervous system is created for living fulfillment. And if one sees this is determined, one jumps on to that state of fulfillment, lives that life of fulfillment. (1971a)

Here, Maharishi associates strong free will with the development of consciousness, that is, with the amount of creative intelligence that one is living in life. If we are not living a high level of creative intelligence, we have weak free will and are at the mercy of circumstances. The more creative intelligence a person spontaneously has available, the more free will that they have.

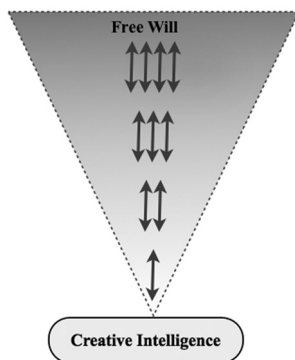


Figure 1: Free will is not an absolute quality in the waking state. It is relative to the amount of creative intelligence one has; more creative intelligence is associated with more free will and vice versa.

The implication of this principle is that we need to engage in actions that will increase the amount of creative intelligence spontaneously available to us if we want to maximize our free will, that is, maximize our ability to speed up the rate at which we are gaining enlightenment. Maharishi explains:

There is an area in every individual which is in tune with the free will of cosmic intelligence, the free will of God, that area we term ‘the field of pure intelligence.’ And through Transcendental Meditation it is our experience that our conscious awareness can easily be saturated with that area of free will, that area of creative intelligence. (1971a)

Free will and knowledge

It is sometimes argued that freedom is a function of knowledge. If we do not know what possibilities exist for us, then our choices are limited to that extent. If we think we only have three choices, when in fact we

have ten choices, then our free will can operate only within a limited context, because we are only choosing among three rather than from ten options. Maharishi, however, has pointed out that knowledge, in the sense of intellectual understanding, is not by itself enough to determine action, because we may understand what is right to do, but we may still be unable to do it because of our quality of consciousness, for example as expressed in our emotional state at the time of an action. What is needed in addition to knowledge is the consciousness that allows us to actually act in the ideal way we desire.

A key quality of life that affects behavior, for example, is fatigue—tiredness versus freshness. If we come home tired, then even knowing how we should interact with the family, in spite of this knowledge, we may not act in that way. Thus, beyond an understanding of right action, a particular quality of consciousness is necessary in order for one to act freely in a way that one wants.

This principle illustrates that for Maharishi, free will is not an abstract philosophical concept. It is an expression of the natural desire to spontaneously live an ideal quality of life. Maharishi thus adds this criteria to his definition of free will—the ability to act in the way that one wants to act, not being a football of the environment, of chance and circumstances, or of weaknesses in one's quality of consciousness. This definition of free will is derived from the practical experience we have that we can make choices, but that in many cases we are not making ideal choices. For whatever reasons, often simply from fatigue, we just react to whatever circumstances we find ourselves in.

Action and reaction

In Maharishi Vedic Science, the circumstances we find ourselves in are explained as neither chance nor random, but in fact the product of our past actions. Maharishi explains those circumstances from the principle of karma—reaping what we have sown. He describes this principle in his commentary on verse 39 of Chapter 1 in the *Bhagavad-Gita*. He begins by noting that “[w]hen we investigate the invisible mechanics of nature, we find that everything in the universe is directly connected with everything else. Everything is constantly being influenced by everything else.” He continues:

Certainly man is the master of his own destiny. He has free will—the greatest of God’s gifts to him—whereby he has complete freedom of action. But having performed an action he has to bear its consequence, for reaction is always equal to action. (1968, p. 63)

Thus in every present, we are reaping the consequences of our past actions. This is the determinism aspect of the free will and determinism dichotomy.

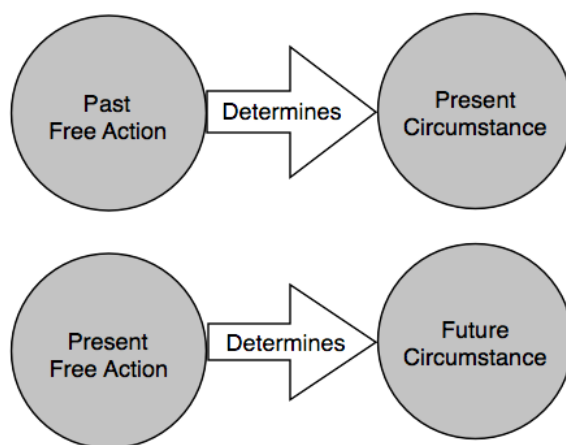


Figure 2: Our past free actions have determined our present circumstances. Our present free actions will determine our future circumstances.

Every present is not limited to this reaping, however, particularly for individuals who practices the Transcendental Meditation technique, as Maharishi explains in *The Science of Being and Art of Living*:

This aspect of the karma of the past is something beyond the control of the doer. The best the doer can do to in the present in order to neutralize the influence of past karma is to engage in the practice of Transcendental Meditation, which will readily raise the consciousness of the doer and produce favorable influence in the surroundings; when the consciousness is raised, energy and intelligence is increased. Then, whatever is the influence from the past, that influence will not be able to nullify present action. Certainly the influence of past karma will be there, but it may not completely guide the destiny of the present. (1963, p. 174)

Here free will comes into play. How are we going to react to the situation? Are we going to utilize all our knowledge to maximize progress in the situation, or will we be overshadowed by the situation and find ourselves reacting in habitual ways. In the above quote, Maharishi indicates that how we react to our past karma is a function of development of consciousness.

The interplay between action and reaction gives a second answer to the questions raised in the introduction. There is an aspect of every present which is determined: the consequences of our past actions. And there is also, simultaneously, an aspect of every present which is more-or-less free (depending on the quality of consciousness we bring to the situation): our ability to act in those circumstances. Thus, for Maharishi, free will and determinism are two sides of the same coin. What was free action yesterday determines our circumstances today. What is free action today will determine our circumstances in the future. His conclusion: to create the best possible future we want to be continuously increasing our free will day by day through practice of the Transcendental Meditation and TM-Sidhi programs.

Maharishi Jyotish

In his Vedic Science Maharishi has described in rich detail the structure of Transcendental Consciousness. He refers to Transcendental Consciousness as the field of pure intelligence and the home of all the laws of nature that structure creation and govern its evolution. He explains how the total potential of natural law is created through the self-interacting dynamics of this unified field, called *Samhita* in Vedic Science. As pure consciousness knows itself more and more thoroughly it discriminates the primordial relationship, or cycle, of knower, process of knowing and known, termed *Rishi*, *Devata*, and *Chhandas*. The interactions of this cycle amongst itself and with the unity of *Samhita*, creates the total potential of natural law called the Veda and Vedic literature—pure knowledge and its organizing power—the blueprint of creation (see Oates).

Maharishi Jyotish, the sixth Vedanga of the Vedic literature, is the science and technology of this unified source of the total range of space and time—past, present, and future. The set and orderly sequence of natural law structuring creation allows an individual who is properly

trained in Maharishi Jyotish to know anything, because as mentioned in the introduction, if a process is perfectly orderly, knowing one point, we can calculate every other point.

The knowledge of the past and future does not have to be calculated for those who are fully alert at the Samhita level of pure consciousness—it is spontaneously available through Vedic mathematics. Maharishi Jyotish terms this all-knowing awareness *Jyotish Mati Pragma*. Jyotish Mati Pragma is the clear experience of Transcendental Consciousness in terms of its all-knowingness quality (Schneider, et al, 1991–92). Maharishi has indicated that practice of Maharishi Jyotish on the basis of the Transcendental Meditation and TM-Sidhi programs, develops Jyotish Mati Pragma.

Maharishi has brought to light in his Jyotish the knowledge of fully developed Jyotish Mati Pragma in which all the relationships inherent in the mechanics of the unfoldment of creation are eternally available. Maharishi Jyotish simplifies these tremendously complex interactions of natural law into simple cycles in multiples of the primordial three—9 *grahas* or planets, 12 *Rashis* or constellations, and 27 positions of the moon called *Nakshatras*. Maharishi Jyotish gives deep insight into the functioning of natural law, but in a simplified way that make it easy to learn and practical to apply. It teaches how to use these cycles of 9, 12, and 27 to calculate the knowledge of any time period in an individual's life, including knowledge of the future (Schneider, et al, 1991–92). This knowledge is very practical because it can be used to avert any dangers which have not yet come and thereby make the path of evolution smooth and comfortable.

A record of the past influencing the present

In a Jyotish chart there are two main interpretations that are calculated. The first gives the basic characteristics of the individual, that is, our personality, the inclinations of our mind, our habits, etc. As Maharishi explains in his commentary on Chapter IV, verse 5 of the Bhagavad-Gita these relate directly to our level of consciousness: “Man is born as the result of his past actions, good and bad. So his vision remains colored or obstructed by those influences” (1968, p. 259). Here Maharishi is indicating that our personality, inclinations, and habits have been formed as a result of past actions.

Maharishi explains more fully the influence of the past with respect to our level of consciousness in his commentary on Chapter VI, verse 43:

Suppose that a cloth needs dipping a hundred times in the dye before it is fully colored. And after it has been dipped ten times, the factory closes. The cloth will then be taken to another factory. The second factory can only start from the eleventh dipping. But even though the cloth could not be fully colored by a continuous process in one factory, the degree of color attained in the first factory determines the starting point in the second. When a man begins to meditate, Being begins to grow in the nature of his mind. If after a certain degree of infusion he stops the practice in this life, or if his body perishes, whenever he again resumes his practice, he will do so at that level of purity of consciousness which he had attained through his former practice. (1968, p. 462)

Maharishi here indicates that we are born with a certain level of consciousness, and thus a certain amount of free will, and that level was determined by our past evolutionary actions. The level of consciousness that we brought into this life is interpreted in a Jyotish chart from those elements of the chart that indicate the personality, inclinations, and habits with which we are born.

The second category of interpretation provided by a Jyotish chart relates to Maharishi's description of the function of natural law in bringing us the consequences of our actions. We noted in the first section Maharishi's explanation that the laws of nature governing human evolution function according to the principle of karma—as you sow, so shall you reap. With respect to those laws, Maharishi notes that “The laws of nature cannot be deceived; the reaction will come” (1963, p. 87).

The waking state intellect tends to experience time linearly. Such an intellect tends to think of the principle of karma in terms of reaction following action in a linear manner: we smile at the postman, who in turn smiles at the next individual he meets, and so forth. However, Maharishi Jyotish brings to light the important principle that the natural laws governing karma do not return the result of past actions in a linear sequence: rather, they function in a set sequence of *cycles*.

In the *Science of Being*, Maharishi illustrates the principle of karma with the analogy of a post office delivering a letter.

A letter sent by a man a long way from home to his father reaches the home, and if, when it reaches the home, the father has gone to another town, it is redirected to him there. If the father has traveled still farther to yet another town, it is again redirected to him. (1963, pp. 129–30)

Maharishi uses this analogy to illustrate the principle that the laws of nature express a value of cosmic intelligence that will always be able to deliver the consequences of past action to the actor.

This analogy can be further elaborated, however, to illustrate the role of natural cycles in this process. Science reveals that many natural phenomena occur in cycles, mainly because of the earth's revolution on its axis and around the sun. In terms of the post office analogy, what this means is that although engaging in any action is like sending oneself a letter, these letters are sorted into boxes at the 'cosmic post office' according to two values. The first value is the *kind* of reaction that is determined to return to the doer according to the nature of action performed. The second is the *cycle* in which all such kinds of reaction get returned to doers.

In this analogy two possible circumstances regarding these cycles are implied. The first is that one may engage in an action, and being in the cycle during which the set reaction is returned, one may experience the cycle of action and reaction as linear. However, if one has been storing up a lot of 'letters' for this kind of reaction, the experience may also be experienced as highly disproportional to the quality of the initial action. One might, for example, give a glancing smile to a friend, and the friend responds with a deep and long bear hug.

The second circumstance regarding these cycles is that one may engage in an action, but due to the fact that one is not in a cycle during which the reaction to such kinds of actions are returned, one has to wait to experience the effect of that action. This second situation is illustrated by situations in which the environment remains entirely indifferent to persistent and concerted efforts in a certain direction. One is delivering high quality resumes to several companies and seems to be having good interviews, but no one is offering a job.

The *timing* of these sequences or cycles of reaping the consequences of past karma are the second principle item read from a Maharishi Jyotish chart. The chart indicates that at this time in our life a particular kind

of past action is going to bring its associated reaction. And then we move to a different time period, with a different cycle of the results of past actions being returned. These cycles determine the circumstances that we find ourselves in at any present moment. Maharishi emphasizes that the whole thing is systematic and set, due to the innocent functioning of natural law.

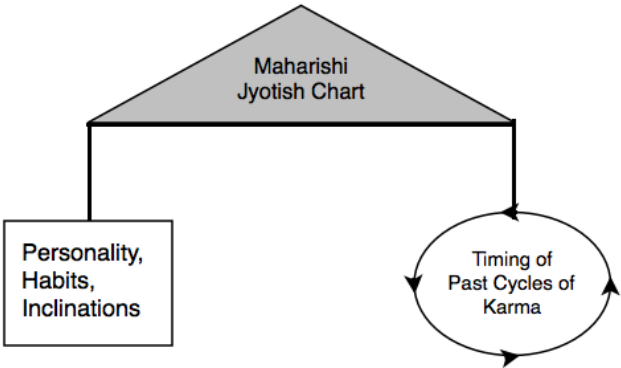


Figure 3: The chart owner’s personality and the timing of the effects of past karma returning to the chart owner are both read from a Maharishi Jyotish chart.

It is these two components—the personality and cycles of karmic consequences—that are integrated by a Maharishi Jyotishi to give predictions about the future. We have a personality and we have the circumstances with which this personality is going to interact. With knowledge of these two features of life, the Maharishi Jyotishi can predict what is going to occur according to the principle that a certain kind of personality is going to react in a predictable way in various circumstances. A person who is inclined to anger, for example, and finds himself under a lot of pressure has a high probability of reacting angrily to those circumstances. The combination of such factors allows the Maharishi Jyotishi to make predictions.

The effect of background on prediction

Even with these two elements available, something more must be accounted for in order to produce precise prediction from a Maharishi Jyotish chart,

however. We have indicated that Maharishi Jyotish charts encode laws of nature that govern the life of the person or entity for that chart. Any law of nature can be used to either predict the future or ‘retrodict’ the past because they describe cause and effect relationships. As causes always precede effects, laws which describe these relationships can be used to predict future effects when present or past causes are known.

However, in order to use laws of nature to make specific predictions, something more has to be added to the law of nature, namely the details of the particular historical setting under consideration. The law of gravity predicts what happens to all apples when they fall. But if you want to make a specific prediction about the velocity with which a specific apple will fall, at a particular time, in a particular place, you have to specify all of those variables—the size of that apple, how high off the ground it is and how high that is above sea level—all those particulars have to be specified before you can make the prediction about what is going to happen in that circumstance.

In the same way, a Maharishi Jyotish chart is an encapsulation of the general laws of nature governing personality and cycles of past karma. All its constituents—the 9 Grahas, the 12 Rashis, the 27 Nakshatras—are the same, whether you’re talking about an historical personage’s chart thousands of years ago, or your grandfather’s chart 90 years ago, or your chart today. In order to make specific predictions for each chart owner, information about the historical setting and the cultural and social background of the person must be added to those general elements.

For example, if one of the general laws of nature expressed in a chart indicates an inclination to work with metal, the specific prediction being made will differ greatly depending on the historical setting. If the chart is interpreted two thousand years ago, then the metals that the native may be working with are limited to gold, silver, or other metals of that era. But if it is being read today, then the metals that are available might be of a larger range.

In the same way, social and cultural background are important for making predictions about individuals living in the same historical time period. Let us say that a person’s chart indicates that on a particular day he is going to become a king. One person’s chart that is being read is Prince Charles, and another person’s chart that is being read is a

shopkeeper somewhere. The predicted day comes and Prince Charles becomes the king of England, and the shopkeeper makes the final mortgage payment on his shop, and he is now the king of his domain, of his territory of influence. These events can be predicted from the same general law of nature, the same principle in the chart, but in order to make the specific prediction we have to also take into account these other specific social, cultural and historical variables.

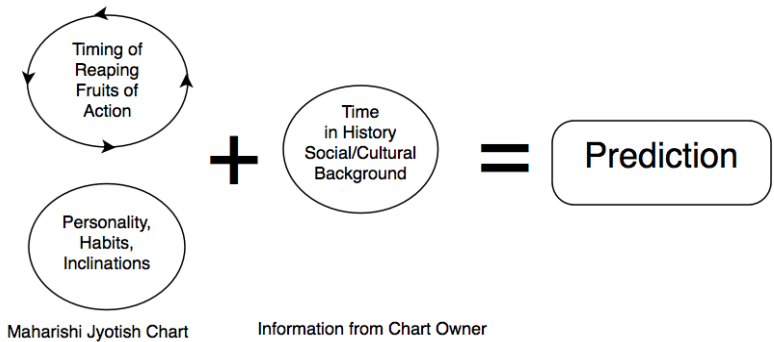


Figure 4: The combination of the personality and timing of the consequences of past actions plus details of a person’s social, cultural, and historical circumstances allows precise predictions in Maharishi Jyotish.

Some of these variables are particularly important with respect to the issue of free will and determinism. As we have seen from the discussion of Maharishi’s explanation of weak versus strong free will, the most important background variables are those features of our life that relate to the development of consciousness. These may include, for example, whether the person is practicing the Transcendental Meditation and TM-Sidhi programs, or whether we have had Maharishi Yagyas performed. All of these current background elements would need to be taken into account with respect to making predictions.

Take for example a person whom the Maharishi Jyotishi assumes is living a ‘normal’ level of waking state consciousness where the will tends toward the weak end of the scale. The individual has a certain personality, they are coming into a certain set of circumstances, and it is then a fairly straightforward process of predicting how that personality will react within those circumstances. However, a person whom

the Maharishi Jyotishi assesses as having more free will available to them, who has more consciousness available to them, will be predicted to react differently in the same circumstances.

A Maharishi Jyotishi makes different predictions according to his assessment of the degree of free will an individual has available because Maharishi has explained that the actions of a man with maximum free will are not unpredictable. Rather, they are predicted to be evolutionary because they are intelligent; they are derived from the use of maximum creative intelligence. As Maharishi described in another talk at the same Science of Creative Intelligence symposium in July of 1971:

Free will is always for maximum, because the tendency of the will is for more and more. This is life: Always one wants more and more. If one has a free choice, one would like to have more and more. (1971b)

Here Maharishi notes that a person who has more free will, more consciousness, will use that free will to speed up their evolution. And speeding up their evolution means that in any circumstance they find themselves, they will try to act in a way that maximizes the good that will be coming to them in the future. In other words, they act in any circumstance in a way that they feel is most evolutionary—or a way that *is* most evolutionary under the spontaneous influence of increased creative intelligence.

Freedom and action

We mentioned earlier that free will is a practical rather than philosophical principle in Maharishi Vedic Science. Maharishi defines free will in the context of our ability to act. In a talk given in Villars, Switzerland in 1973 he explained:

If we accept the influence of the past, that may be all right—as long as we accept that the present is more evolved and therefore is more powerful and therefore we can do what we want to do. The past will influence, will try to give a direction, but we are not obliged to fall prey to that.

And he continues: “We can steer our own course and make headway and we can accept the influence of the past. But we do not have to feel paralyzed in any sense.”

Thus freedom is useful insofar as it gives us control of our actions, that is, insofar as it disallows us from being what Maharishi likes to term “a football of the environment.” Environment in the context of Maharishi Jyotish includes not only the circumstances we encounter in every present, but our own inner environment as well, that is the strengths and weakness of our personality that we inherited in this life due to our past actions.

We have already noted that Maharishi directly associates free will in man with the process of gaining enlightenment. In his commentary on Chapter IV, verse 12 of the Bhagavad-Gita he notes: “Success is certainly gained by effort.” He continues:

[W]hereas in the lower species the evolution of the soul depends upon the upward moving current of evolution in nature, in the human species the soul has freedom of action, and [that] therefore the development of man depends upon how he acts and what he does. (1968, p. 268)

However, although Maharishi clearly equates freedom with action that accelerates the unfoldment of enlightenment, unlike previous commentators on the Bhagavad-Gita, he clarifies that action for enlightenment should not be a strain. It can be a completely natural outcome of the development of consciousness accomplished through practice of the Transcendental Meditation and TM-Sidhi programs. Thus it is necessary to act, to apply our will. But Maharishi gives the guideline that such action should not involve strain. Chapter VI, verse 17 teaches:

*For him who is moderate in food
and recreation, moderate of effort
in actions, moderate in sleep and
waking, for him is the Yoga which
destroys sorrow.*

Maharishi (1968) comments on this verse:

Moderate of effort in actions means that one has not to over-exert when working. This implies first, that one should be strong enough not to get tired—in other words, one should be energetic, alert and free from laziness; and secondly, that the undertaking should be in accordance with one's own dharma, consistent with the Laws of Nature, otherwise nature offers its silent protest against the effort, and one is compelled to make unduly great 'effort in actions.' The regular practice of Transcendental Meditation fulfills both these needs because it provides greater energy and produces harmony in nature. (p. 417)

The term *free will* consists of two words, one modifying the other. On a practical level, Maharishi seems to emphasize the freedom element over the will. Will is associated with effort. Freedom is associated with spontaneity. By definition spontaneity is easier than effort. In his Vedic Science, Maharishi has emphasized developing that quality of consciousness which allows one to spontaneously interact with challenging situations and circumstances in a way that maximizes speedy evolution, rather than development of will power as a way of producing such actions. In this context, how can Maharishi Jyotish aid in helping us increase the evolutionary content of our moderate actions, of that portion of our day outside of meditation where we stabilize pure consciousness?

Maharishi Jyotish and Maharishi Yagya

One very practical value of Maharishi Jyotish is that it gives the timing of circumstances which result from past actions, which may be a pressure for the chart owner. If these future circumstances are of a life-threatening or serious nature, Maharishi Yagyas are recommended. Maharishi Yagyas are performances by Vedic pandits that create an influence which can avert dangers which have not yet come.

In explaining the principle of karma in his book the *Science of Being*, Maharishi notes:

[T]he vibrations set forth by the performance of an action travel around the doer, striking against everything in the surroundings, traveling far and wide. They strike against everything on Earth, on the moon, the sun and the stars, and keep on traveling in the entire field of the universe, influencing everything that they come across.

He continues: “The reaction created by these vibrations as they strike against everything in the universe travels back to the performer as a rubber ball thrown against a wall bounces back to the thrower (1963, p. 129).

Because Maharishi’s explanation of karma is in terms of vibration, it is natural to explain the principle of Maharishi Yagyas—sound vibrations created at subtle levels of creation—in terms of fields and wave mechanics in physics. Our thoughts and actions create vibrations or subtle waves, and those waves interact with many objects in the universe. These interactions create new waves which eventually return to the actor. Thus at any particular time there are particular impulses resulting from our past actions that *are on their way back to us*. A person trained as a Maharishi Jyotishi knows how to predict the timing of these consequences of past actions coming back to us in the future, including those that will create circumstances that will be negative, very uncomfortable, or even dangerous—that is, life threatening. Under these circumstances he will recommend a Maharishi Yagya.

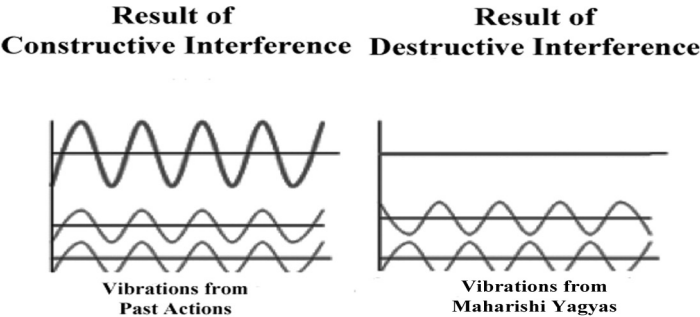


Figure 5: Maharishi Yagyas operate according to the principle of destructive wave interference, where equal and opposite waves interact to cancel each other.

The principle under which these yagyas operate is that at a certain time in the present, some new action is commissioned on your behalf by experts in creating life-supporting impulses. These experts create another set of subtle waves that will interact with the consequences of past actions that are coming back to you in a way that will neutralize

these vibrations. This is termed destructive interference in wave physics. Constructive interference describes wave interactions that produce a peak that combines the height of both of the waves. However, if two equal and opposite waves interact at the proper timing they will cancel each other. Maharishi Yagyas can be performed to create either constructive or destructive interference. Destructive interference is used to avert the danger that has not yet come. Constructive interference is used to magnify auspicious desires for our life.

The crucial factor in Maharishi Yagyas is the timing. Yagyas have to be performed at a certain time and in such a way that they meet the vibrations coming to you *before* they have arrived. This effect on future vibrations is why Maharishi Yagyas are not very effective for conditions that we are already experiencing in the present. In these situations, the vibrations have already returned. Maharishi Yagyas are not meant to neutralize negativity in the present. Maharishi Ayur-Veda deals more effectively with that. For this reason, with respect to health issues, Maharishi often describes Maharishi Ayur-Veda as dealing with the present, and Maharishi Jyotish and Maharishi Yagya to deal with the future (although Maharishi Ayur-Veda also has numerous practices designed to detect and avert dangers coming in the near future as well).

Maharishi Jyotish and strengthening free will

A Maharishi Jyotish consultant may predict circumstances forthcoming in our lives that, although not serious enough to warrant a Maharishi Yagya, will create a challenge to evolutionary action for our personalities. We have seen from the discussion of the mechanics of karma in Maharishi Vedic Science that if we do not want to be continually facing the same circumstances over and over in the future, we have to react to pressured circumstances in the present in a more evolutionary manner than we did in the past. The essence of Maharishi's teaching on this point is that the only practical way to change our thinking and action is to develop our consciousness. And the applied value of Maharishi's Vedic Science provides knowledge of a wide range of techniques that simply and naturally remove the structural and chemical abnormalities that block the development of pure consciousness.

If we want to increase our ability to spontaneously act in a more evolutionary manner, Maharishi recommends that we take maximum

advantage of these technologies available in his Vedic Science at any particular time. Taking advantage of all techniques and knowledge available in Maharishi Vedic Science will develop the greatest possible creative intelligence—something we need particularly at times when we will be under maximum pressure from the environment. If the circumstances are not life-threatening and do not warrant a Maharishi Yagya, or if for one reason or another we are unable to procure the needed Maharishi Yagya, but we know we are going to be facing some challenge in the future, then it might be wise to supplement regularity with the Transcendental Meditation and TM-Sidhi programs by taking advantage of other programs Maharishi has made available to accelerate the growth of consciousness like an ideal daily routine indicated in Maharishi Ayur-Veda, or extended practice of the Transcendental Meditation and TM-Sidhi programs on special courses. Taking advantage of more of Maharishi's technologies will provide the maximum free will that your nervous system can support and will allow maximum spontaneously evolutionary action in pressured circumstances in a way that will create the best possible present effect and future destiny.

Taking maximum advantage of Maharishi's programs for the development of consciousness utilizes the principle of the second element in Maharishi Vedic Science. This principle recommends attending to solutions rather than problems. If a room is in darkness, switch on the light rather than look for a way to deal directly with the darkness. Light spontaneously eliminates darkness. In the same way, rather than attending to the specifics of future dangers, Maharishi recommends developing that state of consciousness now which will spontaneously be able to handle any circumstance, no matter how challenging in the future. As mentioned above, spontaneously handling challenging circumstances emphasizes the 'free' rather than the 'will' aspect of free will.

In the pursuit of stronger free will, however, there is an interesting interplay between our personality as indicated by Maharishi Jyotish and the actions necessary for increased stabilized pure consciousness in our lives. Over the course of his teaching, Maharishi brought to light *many* techniques and recommendations for maximizing the speed of our evolution. These techniques and recommendations apply to all areas of life including daily routine, diet, work habits, and exercise. A person

who is able to follow all of these recommendations will be evolving as fast and comfortably as his nervous system will allow.

However, it is in precisely those areas of weakness in the personality, as indicated in the Jyotish chart, in which it is most challenging for an individual to take advantage of Maharishi's recommendations for maximum evolution. Whether it is going to bed on time, eating properly, keeping a proper balance of work and recreation, or whatever the weakness is in a personality, because it is a fundamental quality of the individual's consciousness, it is precisely those areas where it is most challenging to act in a spontaneously evolutionary manner and therefore it is these areas that can impede the speed of our evolution.

Maharishi Jyotish is again helpful in this area. Those areas of the personality which are less self-sufficient are indicated by elements of the chart which manifest in cycles. That is, if a person has a particular area of the personality which is weak with respect to spontaneous evolutionary action in a particular area, this weakness does not manifest in life in a uniform manner. There are periods of time in which we will feel weaker in this area and other periods when we will be more self-sufficient according to the Jyotish cycle we are in. These periods can be predicted in the same way that the cycles of past karma returning to us can be predicted. Taking advantage of this knowledge we can build momentum for strengthening our willpower in an area during those times when the chart indicates we are going to be more self-sufficient in that area. Again, Maharishi teaches that increasing our will power does not mean straining. It simply means putting our attention on taking more advantage of technologies in Maharishi Vedic Science that promote speedy evolution at a time when our personality will more easily be able to engage in more evolutionary activity in that area.

To summarize Maharishi's teaching on the development of free will: rather than worrying about what we have to face in future, we attend to developing maximum creative intelligence in the present. Developing maximum creative intelligence is a step-by-step, day-by-day endeavor. Each day we attend to doing things which will spontaneously and naturally maximize our creative intelligence and therefore our free will. Each time we maximize our creative intelligence we are in a stronger position to take advantage of more technologies or of Maharishi Vedic Science that accelerate evolution to higher states of consciousness.

In this context, Maharishi has indicated that one thing that can impede our evolution is continuing to act according to old habits and beliefs even when our consciousness is developed enough to make such things unnecessary. In his free will and determinism talk he explained:

It is generally the case that one likes to cling on to his associations. His level of consciousness may have gone so high, but he remembers the previous associations and tries to cling to them.

He concludes, “but some misunderstandings, which we know now to be misunderstandings, everyone keeps on clinging to that even though they are becoming weak and their structure is falling apart” (1971a).

Here Maharishi indicates it is possible and even natural, in other words, to continue to act in less-evolutionary ways simply due to habit, but not necessarily because that is the only action our consciousness will support. The technique of *Acharya Rasayana* Maharishi has brought out in his Ayur-Veda seems to be oriented to this circumstance. *Acharya Rasayana* predicts that if, in the context of practicing the Transcendental Meditation and TM-Sidhi programs, we put our attention on doing what we know to be right outside of meditation in activity, we can loosen bad habits that we may still be carrying with us, and act to accelerate our evolution. In this, and other elements of the ideal daily and seasonal routine, Maharishi does seem to introduce the element of making some effort in order to accelerate the process of evolution. This is the value in Maharishi Vedic Science that intellectual understanding and attention on practical recommendations for daily activity can add to experience. With more experience of pure consciousness through meditation, our efforts outside of meditation for evolutionary activity can bear more fruits.

Conclusion

We began this article with the intention of clarifying Maharishi’s teaching on a seeming paradox: If man has freedom, how can the future be set—but if the future is not set, how can Maharishi Jyotish accurately predict it? We saw that Maharishi’s explanation of this situation seems to hinge on whether we are dealing on the cosmic or individual level and the concept of strong and weak free will. He explains

that from the cosmic perspective, it is determined that everyone will become enlightened. But from the individual perspective, how we freely act determines how quickly we become enlightened. In essence, Maharishi defines free will as *the ability to engage in action that promotes maximum speed of evolution in the face of non-evolutionary influences from one's inner or outer environment*. He further explains, however, that on the path of gaining cosmic consciousness, free will is not an absolute value. Rather, the amount of free will a person has—that is, the amount of freedom he has to act on what he knows to be right—is a function of how much creative intelligence has been stabilized in his awareness. This explanation of free will gives a new insight into the practical value of the development of creative intelligence through regular practice of the Transcendental Meditation and TM-Sidhi programs.

With respect to the issue of prediction in Maharishi Jyotish, we saw that if a person has weak free will, then we predict he will act according to (1) habits and set qualities of his personality in response to (2) whatever circumstances he faces in the present due to his past actions. Both of these features can be read from a Jyotish chart and therefore the actions of an individual with weak free will can be predicted.

Maharishi has clearly connected strong free will with the freedom quality of the field of pure consciousness. He makes this connection because pure consciousness is a field of all possibilities, which by definition is a prerequisite for absolute freedom. Pure consciousness is also, however, a field of pure intelligence, of perfect order. Thus, Maharishi seems to indicate that a person who is functioning from a level of more stabilized pure consciousness freely chooses to act only according to one principle: action in accord with the evolutionary impulse of natural law, that is, action which according to his understanding maximizes his evolution at that time. Because Maharishi in his Vedic Science gave a lot of general information about these types of actions within an ideal daily routine, these choices can also be predicted. Thus, the instances of either weak or strong free will are both compatible with the principle of prediction.

Maharishi's teaching here gives some intellectual understanding of a paradox—our evolution is both determined and free—but does not eliminate a feeling of paradox for the waking state intellect still on the path to developing higher states of consciousness. All of Maharishi's fun-

damental teachings, in the end, come down to expanding our awareness to encompass the all possibilities nature of pure consciousness: a field that is one *and* three at the same time, whose self-interacting dynamics express the pure knowledge of the Veda both simultaneously *and* sequentially, in whose reality infinity and point *coexist*, one within the other. Free will and determinism in Maharishi Vedic Science partake of this same all-possibilities, integrated, and therefore, to waking state awareness, paradoxical quality. The attempt to understand their integrated relationship will never be complete until intellectual understanding is fully developed in the experience of Unity Consciousness. But Maharishi Vedic Science is so beautifully evolutionary, that the inquiry itself produces growth in the direction of that experience.

References

- Churchland, P. M. (1988). *Matter and consciousness*. Cambridge, MA: MIT press.
- Maharishi Mahesh Yogi. (1963). *The science of Being and art of living*. New York: Signet Books.
- Maharishi Mahesh Yogi. (1969). *On the Bhagavad-Gita: A new translation and commentary*. Baltimore: Penguin Books.
- Maharishi Mahesh Yogi. (1971a). *Free will and determinism*. Talk given July 24 at the Symposium on the Science of Creative Intelligence, University of Massachusetts, Amherst. Fairfield, IA: M.U.M. film and tape library.
- Maharishi Mahesh Yogi. (1971b). *Free will and the environment*. Talk given in July at the Symposium on the Science of Creative Intelligence, University of Massachusetts, Amherst. Fairfield, IA: M.U.M. film and tape library.
- Maharishi Mahesh Yogi. (1973). *Infusion of Being and control over action*. Talk given October 27 in Villars, Switzerland. Fairfield, IA: M.U.M. film and tape library.
- Schneider, R., Schneider, C., Heath, C., & Meyer, S. (1991–92). “Maharishi Jyotish: The practical application of the light of consciousness.” *The Source*. Fairfield, IA.

Section III



Higher States of Consciousness: Subjective Experience

King Janaka Questions Yāgyavalkya

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ABOUT THE AUTHOR

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ABSTRACT

The following story is adapted from the Bṛihad-Āraṇyak Upanishad, the longest of the ten principal Upanishads. According to the Muktikā Upanishad (1.30–9), there are 108 Upanishads, although scholars count over 200. Shankara commented upon 11 of them and referred to four more, and so these 15 are considered principle. The Upanishads form the last portion of the Veda and so are sometimes called Vedānt, the end (anta) of the Veda.

The word Upanishad literally means “sit down near,” from upa (near), ni (down), and shad (sit). Traditionally, knowledge was passed down from teacher to student, with the student sitting down near the teacher to receive the secret instruction. Many of the Upanishads consist of dialogues between the teacher and students, or in the case of this story, between King Janaka and the sage Yāgyavalkya.

“Sit down near” (Upanishad) refers to the hidden connection between things, whether it is the connection between the teacher and student, or more broadly, the infinite correlation between all things, the oneness of reality. In this manner, Maharishi explains the word Upanishad to mean “sit near the Veda,” where the speaker, who is in Unity Consciousness, sits near everything because everything is one with his or her own Self.

In the Upanishads the life force that creates and permeates the universe is called Brahman. Brahman is realized through the Self, called Ātmā. The great formula of the Upanishads is that Ātmā is Brahman; i.e., the individual Self participates in and becomes the life force of the entire universe. From the viewpoint of quantum field theory, any part of a field contains the whole field, like a string of pearls in which each pearl contains the whole string. One’s life goal, according to the Upanishads, is to realize the Self and thereby realize Brahman.

Maharāj Adhirāj Rājaraam notes that the Upanishads can be found in the physiology as the ascending tracts of the central nervous system, of which there are several hundred and 15 main tracts. They are responsible for gathering information from millions of sources and integrating them to a holistic experience. They make one out of the many, which is described beautifully in the Upanishads as the ability to appreciate all isolated experiences as the Self—All this is my Self.

King Janaka Questions Yāgyavalkya From the Bṛihad-Āraṇyak Upanishad

In the city of Mithilā, the capital of the kingdom of Videha, lived the famous King Janaka. King Janaka enjoyed great wealth, and Videha was one of the most prosperous of the sixteen great kingdoms of ancient India. This was because King Janaka cultured spiritual values, which brought great benefit to himself and his kingdom. He was virtuous and kind to all, and deeply interested in philosophical questions.

Every morning King Janaka attended the *Agnihotra* offering, a yagya performed by the Brahmins for the prosperity of the kingdom. The Brahmins offered milk and ghee to the sacred fires as they chanted hymns from the Vedas. King Janaka was the *yajamāna*, or patron of the yagya, and so he sat on a special couch and witnessed the performance. Smoke from the fires rose through the *yagya-shala* pavilion and the deep, rhythmical chanting of pandits created a serene feeling for all present.

One morning, the famous *āchārya* Yāgyavalkya sat in silence next to King Janaka at the *Agnihotra* offering. After the performance was over, Yāgyavalkya said,

“Your Majesty, I am very pleased with this Vedic yagya. I will grant you a boon. Ask for whatever you desire.”

“This is the boon I wish for,” King Janaka replied. “May the wise Yāgyavalkya answer any question that I might ask.”

“Your wish is granted,” said Yāgyavalkya. With that, the king began to question the sage.

“My dear Yāgyavalkya,” the king said, “What is the Self?”

“The Self is *Ātmā*,” said Yāgyavalkya. “It is the light within the heart. The Self remains the same, even while a person thinks and moves about. When born, one obtains a body and becomes connected with this world. Upon departing, all is left behind.

“The Self is made of consciousness. It is made of mind. It is made of life. It is made of sight and hearing. It is made of earth, water, fire, air, and space. It is made of light and darkness together. It is made of desire and freedom from desire. It is made of anger and freedom from anger. It is this and it is that.

“The Self is incomprehensible, for it cannot be comprehended. It is indestructible, for it cannot be destroyed. It is the eye of the eye, the ear of the ear, and the mind of the mind.

“Whoever has found the Self, has awakened. He is the creator of the universe, the maker of all. The world is his. Indeed, he is the world.”

“What is the experience of the Self?” asked King Janaka.

“The experience of the Self is the fulfillment of all desires,” said Yāgyavalkya. “The spirit of man hastens to that place, like a falcon who soars in the sky and then folds his wings and flies home to his nest.

“When he thinks, ‘I am everything,’ then he is in the world of the spirit, free from desire, free from evil, free from fear.

“Like a child, he feels peace within. There is no sorrow. The spirit has crossed beyond good and evil, has crossed beyond the sorrows of the heart.

There the spirit sees without seeing,
for there is nothing to see.
There is no second,
nothing other than himself to see.

There the spirit speaks without speaking,
for there is nothing to say.
There is no second,
nothing other than himself with whom to speak.

There the spirit hears without hearing,
for there is nothing to hear.
There is no second,
nothing other than himself to hear.

There the spirit thinks without thinking,
for there is nothing to think.
There is no second,
nothing other than himself about which to think.

There the spirit knows without knowing,
for there is nothing to know.
There is no second,
nothing other than himself to know.

“This is for the person who experiences the Self.”

“My dear Yāgyavalkya, could you speak about the world of dreams?” asked King Janaka.

“In the world of dreams there are no chariots and no roads, yet we create chariots and roads,” replied Yāgyavalkya. “There are no pleasures and delights, yet we create pleasures and delights. There are no ponds, lotus pools, and rivers, yet we create ponds, lotus pools, and rivers.

“The world of dreams is between this world and the next. In the world of dreams the Self reflects upon the joys of this world and also sees the joys of the world to come.

“There is a verse that says:

Abandoning his physical form in sleep, the wakeful Self witnesses his sleeping body.

By his own light he returns home, the spirit of golden radiance, the swan of purity.

As his vital breath guards his nest below, the immortal spirit soars afar. He flies wherever he desires, the spirit of golden radiance, the swan of purity.

He goes above and below, up and down, in his state of dreams. He becomes like a god who creates many forms for himself, now enjoying the company of beauty and laughter, now seeing fearful sights.

“When the spirit returns from the land of dreams,” Yāgyavalkya continued, “where he has seen good and bad, whatever he has seen does not return with him, for he is not attached. As a fish swims between two banks of a river, so the Self moves between the world of waking and the world of dreaming.”

“I give you a thousand cows,” said King Janaka. “Please tell me, what is real joy?”

“Joy is Brahman,” said Yāgyavalkya. “Most human beings enjoy only a small portion of the joy of Brahman.

“Your Majesty, imagine a person who is healthy, wealthy, admired by others, and provided with all human pleasures. This is the greatest joy for humans.

A hundred times this joy
 is the joy of the world of the ancestors.
 A hundred times the joy of the ancestors
 is the joy of the world of the Gandharvas.
 A hundred times the joy of the Gandharvas
 is the joy of the world of the Devas.
 A hundred times the joy of the Devas
 is the joy of the world of Prajāpati.
 A hundred times the joy of Prajāpati
 is the joy of Brahman.

“This is the joy of one who is pure and free of desire. This is the supreme joy, the highest bliss, the world of the spirit.”

“I give you a thousand cows,” said King Janaka. “Please tell me, O Yāgyavalkya, what happens at the time of death.”

“Your Majesty,” said Yāgyavalkya, “think of how a cart, loaded with heavy stones, groans and creaks when it moves. Like that, the body is a cart, and it groans as a man approaches death and is breathing with difficulty.

“Think of how a fig is loosened from its stem. Like that, when the body becomes thin and weak from old age or disease, the spirit in man releases itself from the body. Then the spirit returns by the same way to the place from which it started.

“When the person becomes weak and seems unconscious, all the powers of nature gather 'round; then the person collects his vital powers and enters into his own heart.

‘He is becoming one; he sees no more,’ they say.

‘He is becoming one; he speaks no more,’ they say.

‘He is becoming one; he hears no more,’ they say.

‘He is becoming one; he thinks no more,’ they say.

‘He is becoming one; he knows no more,’ they say.

“Then a light shines in his heart, and this light guides him as he departs. The vital breath departs with him, and the other senses go with the vital breath. As he enters into life’s unbounded intelligence, his own intelligence departs with him—his ageless wisdom, his deeds, and his past experience. They as if take him by the hand and guide him.

“Think of when a king approaches a village. The nobles and officers, the charioteers and the heads of the village prepare food, drink, and lodging. They say, ‘The king is coming! Here he comes!’ Like that, all the powers of nature wait for the one who is approaching death, saying, ‘Brahman is coming! Here he comes!’

“Your Majesty, think of a caterpillar and how it climbs to the tip of a blade of grass. See how it reaches out to another blade of grass and draws itself over to it. Like that, the spirit departs from this body and its ignorance, and reaches out to another body and draws itself to it.

“Think of how a goldsmith takes an old piece of gold and creates a new and more beautiful form. Like that, the spirit, having departed from the body and its ignorance, creates another new and more beautiful form, like the form of his ancestors, or a Gandharva, or a Deva, or other beings.”

“I give you a thousand cows,” said King Janaka. “O Yāgyavalkya, what of desires that remain at the time of death?”

Yāgyavalkya answered,

“The mind goes towards the object it desires. Of this it is said,

If he desires the world of fathers,
by his mere intention, fathers arise.
Living in the world of fathers, he is filled with joy.

If he desires the world of mothers,
by his mere intention, mothers arise.
Living in the world of mothers, he is filled with joy.

If he desires the world of friends,
by his mere intention, friends arise.
Living in the world of friends, he is filled with joy.

If he desires the world of perfumes and garlands,
by his mere intention, perfumes and garlands arise.
Living in the world of perfumes and garlands, he is filled with joy.

If he desires the world of song and music,
by his mere intention, song and music arise.
Living in the world of song and music, he is filled with joy.

“He does not, however, stay in those worlds forever,” Yāgyavalkya continued. “When the fruits of his actions in this world are exhausted, then he comes again from that world to this world. He who has desires is born again by virtue of those desires. He is born again along with his desires. This is for the person who desires.”

“I give you a thousand cows,” said King Janaka. “What of freedom from desire?” he asked.

“Freedom from desire comes from knowing the Self,” Yāgyavalkya replied. “If a person knows the Self, he knows ‘I am this.’ Then what can he wish for? He has fulfilled his desires. What desire takes him to another body? Those whose desires are satisfied are fulfilled souls—all their desires vanish even here on earth.

“There is a verse that says:

When all the desires that dwell deep in the heart are cast away,
then a mortal becomes immortal, then he attains Brahman.

“While we live in this life,” Yāgyavalkya continued, “we may become fulfilled, our desires satisfied. And if we do not, then the darkness is deep. Those who have fulfilled their desires in the Self become immortal. They are the knowers of Brahman.

“For those who have freedom from desire, at the final hour, when they think of themselves, they understand this truth about themselves:

You are indestructible.
You are unshaken.
You are the essence of life.

Then King Janaka asked his final question, “What is Brahman?”

“Brahman is infinite, eternal,” said Yāgyavalkya. “It is beyond space, unborn, the great, the stable. When one clearly beholds Brahman then one sees the ruler of what was and what will be. Then one becomes free from fear.

“The knower of Brahman has no bonds of attachment, for he is free. He is beyond suffering. He is beyond fear. Evil does not overcome him; he overcomes evil.

“The knower of Brahman is not overwhelmed by exultation or grief from his past actions, whether good or bad. He is beyond both. What

he has done and what he has left undone do not affect him. He does not ponder many words, for many words are weariness.

“The knower of Brahman has found peace. He is calm. He is patient. He is composed, free from doubt. He has found the treasure of life, the great spirit of the universe, and so he is tranquil.

“There is a verse which says,

I have found a small path, ancient, which stretches far away.

On this path, the wise, the knowers of Brahman,
rise to the heavenly worlds and are liberated.

That path, they say, is white, blue, yellow, green, and red.

That path to Brahman is traversed by the knowers of Brahman,
who perform right action and are filled with light.

“I give you the kingdom of Videha,” King Janaka said, “and I give you myself as your servant.”

And so in the kingdom of Videha the dialogue between the great Yāgyavalkya and the famous King Janaka came to an end. Teacher and student, Rishi and Rāja, they shared together the highest knowledge, the knowledge of the Self. Through this timeless wisdom King Janaka gained eternal liberation in enlightenment and created a prosperous kingdom where people experienced the Self and so enjoyed harmony and happiness in their lives.

असतो मा सद्गमय
तमसो मा ज्योतिर्गमय
मृत्योर्मा अमृतं गमय

*Asato mā sad gamaya
tamaso mā jyotir gamaya
mṛityor mā amṛitaṁ gamaya*

(Bṛihad-Āraṇyak Upanishad, 1.3.28)

*From non-existence lead us to existence,
From darkness lead us to light,
From death lead us to immortality.*

Higher States of Consciousness
in Maharishi Vedic Science

■

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ABOUT THE AUTHOR

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A B S T R A C T

This article reviews a fundamental theme from Maharishi Vedic Science: the existence of four higher states of consciousness—Transcendental Consciousness, Cosmic Consciousness, God Consciousness, and Unity—in addition to the more commonly known waking, dreaming, and sleeping states of consciousness. Maharishi Vedic Science includes technologies for individuals to culture higher states of consciousness—most fundamentally, the Maharishi Transcendental Meditation and TM-Sidhi programs. The process of development of consciousness is unfolded, and each of the higher states of consciousness is defined and explained; references are made to extensive scientific research corroborating the growth of consciousness, including the physiological correlates of higher consciousness.

Introduction

At the core of Maharishi Vedic Science is the existence of several higher states of consciousness, which can be developed through the technologies of Maharishi Vedic Science. In this article, we will explore in some detail Maharishi's explanations of all seven states of consciousness, including definitions of each state of consciousness, means by which these states of consciousness may be achieved, and references to discussions of scientific research defining physiological parameters which reflect the evolution toward higher states of consciousness and the existence of at least five specific states of consciousness.

Implicit in this discussion is a fundamental point: Maharishi Vedic Science differs from modern science in scope and in approach to gaining knowledge. Whereas modern science deals with the objective facts and verifiable phenomena available in the waking state of consciousness, Maharishi Vedic Science encompasses knowledge gained in seven states of consciousness. A corollary of Maharishi Vedic Science is that knowledge is different in different states of consciousness and that each state of consciousness has its own "world"—its own realm of experience (Maharishi Mahesh Yogi, 1997c, p. 178).

In the following passage, Maharishi (1997c) presents, in a general way, the scope of Maharishi Vedic Science, in the context of which Maharishi enumerates the seven states of consciousness (including their Sanskrit names):

The scope of my Vedic Science covers all knowledge of all these seven worlds of the seven states of consciousness. The seven states of consciousness are:

- Waking State of Consciousness (*Jāgrat Avasthā* or *Jāgrat Chetanā*),
- Dreaming State of Consciousness (*Swapn Avasthā* or *Swapn Chetanā*)
- Deep Sleep State of Consciousness (*Sushupti Avasthā* or *Sushupti Chetanā*)
- Transcendental Consciousness (*Turiya Avasthā* or *Turiya Chetanā*)
- Cosmic Consciousness (*Turiyātīt Avasthā* or *Turiyātīt Chetanā*)
- God Consciousness (*Bhagavad Chetanā*)
- Unity Consciousness (*Brāhmī Sthiti* or *Brāhmī Chetanā*). (p. 178)

To understand the scope of Maharishi Vedic Science—and the knowledge available through this science—it is necessary to explore the nature of these seven states of consciousness and the knowledge available in each state.

The Fourth State of Consciousness:

Transcendental Consciousness

The first three of the seven states of consciousness experienced by human beings are the waking, dreaming, and sleeping states of consciousness (Wallace, 1986, p.100). In waking state, one appreciates the objective forms and phenomena of the relative world. One may be completing a project at home, driving to work in one's car, going for a swim. When the body grows tired through the experience of waking state, the body falls into the sleeping state of consciousness in which there is no thought or perceptual awareness. The outer reality of life disappears. Sleep state alternates with the dreaming state of consciousness, in which there is awareness of imaginary forms and phenomena. When dreaming begins, a new reality or world is generated, one which may seem quite unrealistic in waking state, with different objects, even different laws of nature: a lion may walk through the bedroom, a cat may fly through the sky. The subjective experience of each state is different from the others. As the body becomes rested, wakefulness is resumed, and one enters waking state of consciousness again. Life is a constant flow of these three states of consciousness. Subjectively, the distinctions between waking and sleeping, sleeping and dreaming seem obvious,

and each of these states offers a unique subjective experience, a unique “world” of experience.

In addition, physiologists have been able to study parameters that characterize each of these three states. When a human being experiences first waking, then sleeping, then dreaming states of consciousness in succession—with clear subjective shifts in experience as he or she passes from one to another state—the physiology undergoes parallel shifts in functioning which reflect and distinguish each state: heart rate, breath rate, brain wave patterns, even blood chemistry vary in each state. In a separate room from a subject being studied, a psychophysiological studying physiological measures from instruments measuring a subject’s heart rate, breath rate, brain wave patterns, and blood chemistry, could, simply by reading the instruments’ outputs, determine when the subject woke up, fell asleep, and began to dream.

As we have seen, Maharishi Vedic Science presents systematic descriptions of additional states of consciousness. The first and most fundamental of these is a fourth state of consciousness, which is called Transcendental Consciousness or pure consciousness. This state of consciousness is extensively discussed and defined in the Vedic literature—for example, in the following excerpt from the Upanishads.

शिवं शान्तमद्वैतं चतुर्थं मन्यन्ते
स आत्मा स विज्ञेयः

*Shivam shāntam adwaitam chaturtham manyante
sa Ātmā sa vigyeyah*

(Nṛsiṃhottaratāpaniya Upanishad, 1)

The peaceful, the blissful, the undivided is thought to be the fourth; that is the Self. That is to be known. (as cited in Egenes, 1989, p. 365)

The fourth state of consciousness is here defined as “undivided”—that is, the experience of that which is unified—Transcendental Consciousness, the unified field, the field of pure consciousness at the basis of life. The quote also indicates that this experience is the essence of peace and bliss—“the peaceful, the blissful.”

Other key references to this state of consciousness also occur throughout the Bhagavad-Gītā, a central text of Vedic literature for which Maharishi published a translation and commentary in 1967. Maharishi (1967) cites as a key verse of the *Bhagavad-Gītā*, Chapter 2:45, in establishing the existence and significance of Transcendental Consciousness:

निस्त्रैगुण्यो भवार्जुन

Nistraigunyo bhavārjun

(Bhagavad-Gītā, 2.45)

Be without the three Guṇas, O Arjuna.

In his commentary on this verse, Maharishi points out that the great teacher of the Bhagavad-Gītā, Lord Krishna, is teaching his student, Arjuna, a great archer and leading figure of the forces for good, how to rise above the dramatic dilemma he faces. Lord Krishna indicates that Arjuna must transcend, or go beyond, the outer, or relative, sphere of life—that he must “be without the three Guṇas.” The “three gunas” are the three fundamental forces which govern what the Bhagavad-Gītā terms *relative life*—the ever-changing, apparently physical universe—and thus they represent the field of diversity and activity. Maharishi (1967) explains that the instruction to be without the gunas means to go beyond the field of relativity, of ceaseless activity, and transcend to the state of Transcendental Consciousness.

This verse explains the central concept of the Bhagavad-Gītā and the central concept of Maharishi Vedic Science: transcending the ever-changing, diverse world of multiplicity to the unchanging, eternal, field of pure consciousness—the fourth state of consciousness or Transcendental Consciousness—is the key to solving problems and to living life in fulfillment, as Maharishi (1967) indicates in the commentary to this verse.

Everything that has so far been said by Lord Krishna is to prepare Arjuna to understand this practice of bringing his mind from the field of multiplicity to that of eternal Unity. This practice is to brighten all

aspects of his life by bringing his mind to transcendental consciousness, the limitless source of life, energy, wisdom, peace and happiness. (p. 126)

The experience of this field of “eternal Unity,” or Transcendental Consciousness, is the key to improving all aspects of life by bringing the mind to the very source of “life, energy, wisdom, peace and happiness”—and thus a bridge to permanently established higher states of consciousness.

The Maharishi Transcendental Meditation Technique

Maharishi has established the existence of a field of pure consciousness at the basis of life and also a systematic way for contacting this field—the Transcendental Meditation technique. While it is true that the experience of pure consciousness is embedded in the nature of life and may be experienced by any human being, the experience appears to be rare without a systematic technique. Fortunately, it has been shown that the Transcendental Meditation program is a systematic, reliable technique for regularly allowing the mind to settle down to the source of thought, to experience Transcendental Consciousness directly (Roth, 1994, p. 11).

The Transcendental Meditation technique, which Maharishi began teaching throughout the world about fifty years ago, is the most basic technology of Maharishi Vedic Science. Maharishi (1996) offers a summary of this technique:

My Transcendental Meditation is a simple, natural, effortless procedure whereby the mind easily and naturally arrives at the source of thought, the settled state of mind—Transcendental Consciousness—pure consciousness, self-referral consciousness, which is the source of all creative processes. This process can be likened to a river, which naturally and effortlessly flows onto the ocean and gains the status of the ocean. (p. 434)

Here Maharishi establishes two fundamental features of the practice. First, it is simple and effortless. Second, in the practice, the mind comes to experience its own source in Transcendental Consciousness. In the same way that a river flows into the ocean and thereby “gains the status of” the ocean, the mind, settling down to a state of least excitation, is united with its source, Transcendental Consciousness. The Transcen-

dental Meditation technique is learned by receiving instruction from a trained teacher, and details of the practice are given during a seven-step program of personal instruction.¹ Maharishi (1996a) discusses several practical features of the practice in the following passage.

Transcendental Meditation is practiced for 15 to 20 minutes in the morning and evening, while sitting comfortably with the eyes closed. During this technique the individual's awareness settles down and experiences a unique state of restful alertness; as the body becomes deeply relaxed, the mind transcends all mental activity to experience the simplest form of awareness—Transcendental Consciousness—where consciousness is open to itself. This is the self-referral state of consciousness. (p. 434)

Maharishi here describes the essential nature of the practice. While the mind becomes quiet and relaxed, the body—which is intimately connected to the mind—also settles into a deeply relaxed state. Both mind and body settle down to their most quiescent states. In the ultimate stage of this process, the mind “transcends all mental activity,” arriving at a state of deep inner silence, the state of Transcendental Consciousness—also called the “simplest state of awareness”—in which “consciousness is open to itself.” Because in this state consciousness is open to itself, the state is also called “self-referral consciousness.” In this state, the mind is awake and alert inside without being conscious of any outer experience or thought; the mind is quietly aware inside itself—awake to its own nature.

Dr. Keith Wallace, the first scientist to study the physiological effects of the Transcendental Meditation (TM) program, in 1970, elaborates upon Maharishi's description, emphasizing the physiological nature of the practice. Dr. Wallace (1986) emphasizes not only the mental refinement but also a corresponding process of physiological refinement during the practice. The individual (“the observer”) is left in the experience of lively pure awareness—not awareness of anything, simply awareness itself.

¹ Maharishi has trained thousands of teachers of the Transcendental Meditation technique, who offer this program throughout the world in local centers and in Peace Palaces throughout the USA and other countries. The Internet site TM.org contains more information on this program.

The technique involves no mood, belief, or specialized lifestyle; rather it involves a real and measurable process of physiological refinement. It utilizes the inherent capacity of the nervous system to refine its own functioning and to unfold its full potential. In a spontaneous and natural way during the practice, the attention is drawn to quieter, more orderly states of mental activity until all mental activity is transcended, and the observer is left with no thoughts or sensations, only the experience of pure awareness lively in itself. (p. 13)

In his foundational text *The Science of Being and Art of Living*, first published in 1963, Maharishi (1995d) explained this process of transcending through use of an analogy. Using a bubble diagram, he compares the mind to an ocean with bubbles that arise from the base of the ocean as thoughts arise from the most fundamental levels of the mind.

Mind is like an ocean, and, as in an ocean, the surface layers are active in waves and the deeper levels remain silent. The surface layers of the mind are actively functioning while the deeper levels are silent. The surface functioning level of the ocean of mind is said to be the conscious mind. Any thought on the surface level is consciously cognized. The level of the ocean of mind at which the thoughts are appreciated as thoughts is the conscious level of the mind. A thought starts from the deepest level of consciousness, travels through the whole depth of the ocean of mind, and finally appears as a conscious thought on the surface. (pp. 47–48)

Maharishi used this analogy to show that the mind has a surface, active level, and a more silent basis and that thought rises from the silent depths of the mind, as a bubble arises from the basis of the ocean. The bubble appears first in a more subtle form and, gradually, in more and more expressed forms until it reaches the surface, active level of the ocean where it can be perceived. Likewise, thoughts rise from deep inside the mind, first in subtle form, then in increasingly expressed form until, reaching the surface, active level of mind, they are appreciated in waking state awareness.

Considering the bubble moving in the opposite direction, this analogy also illustrates the process of transcending, in which the attention is allowed to move downwards, or inwards, from the conscious, active thinking level to more and more subtle levels of thought and, finally, as Maharishi explains (1995d), to the source of thought—Transcendental Consciousness or Being.

This process of bringing the attention to the level of the transcendental Being is known as the system of Transcendental Meditation. In the practice of Transcendental Meditation, a proper thought is selected, and the technique of experiencing that thought in its infant states of development enables the conscious mind to arrive systematically at the source of thought, the field of Being. (p. 46)

As this quote indicates, the Transcendental Meditation technique allows the mind to arrive at the source of thought, Transcendental Consciousness, a state sometimes referred to in Vedic literature, as we have seen, as *turiya*, which means literally “the fourth”—the fourth state of consciousness (Māṇḍukya Upaniṣad, 1982, p. 18).

As we will see, this direct experience of Transcendental Consciousness is the basis of the growth of higher states of consciousness and the foundation of all individual and collective effects of Maharishi Vedic Science.

The Maharishi TM-Sidhi Program

Another fundamental technology in Maharishi Vedic Science is the Maharishi TM-Sidhi program.² Like other technologies of Maharishi Vedic Science, this technology builds on the foundational program just described, the Maharishi Transcendental Meditation technique. While the Transcendental Meditation technique allows the mind to dive within and innocently experience pure consciousness, the TM-Sidhi program cultures the ability to actively function from within the field of pure consciousness. As we have seen in the articles in the first section of this volume, pure consciousness is also described as the unified field, and physicists have shown the correlation between the unified field of physics and this unified field of consciousness in the Vedic tradition. From both perspectives, the ultimate nature of this field is Unity; it is an unmanifest field of oneness, from which the manifest field of diversity emerges. Therefore, in speaking of the TM-Sidhi program, Maharishi speaks of training the mind to function from Unity.

We have discussed the phenomenon of the self-interaction within pure consciousness, which leads, ultimately, to internal dynamics

² Collective effects of the TM-Sidhi program will be covered in the Government volume in this Consciousness-Based Education series. It may be noted here, however, that people often do learn the TM-Sidhi program not only to enhance their individual consciousness but also to allow the influence on the collective consciousness of the world to be enhanced.

within the field, which appear as manifest diversity. In the TM-Sidhi program, one experiences these internal dynamics—consciousness not only as a field of silence, but also as the field which “generates ripples within itself.”

Therefore, during the TM-Sidhi program, one becomes capable of maintaining the experience of the pure field of consciousness while also experiencing the waves within the field. Maharishi (1996a) therefore refers to the TM-Sidhi program as the “second step.”

The second step for the mind is to train itself to consciously function in this field of Unity. This process I have called the TM-Sidhi program; it is like the ocean generating gentle ripples within itself. The proper description will be that on this level of the field, the perception is that the field is a wave and a wave is the field. (p. 31)

As this quotation indicates, the experience of ripples within pure consciousness, ripples delicately promoted through the innocent experience of the TM-Sidhi program, enhances the ability to function on that refined level where the wave and the field are united. The experience of Transcendental Consciousness through the Transcendental Meditation and TM-Sidhi program enlivens self-referral consciousness, the home of Veda and Vedic literature.

The Fifth State of Consciousness: Cosmic Consciousness:

The regular experience of Transcendental Consciousness alternated with daily activity cultures the nervous system, over time, to maintain pure consciousness even outside meditation, during daily activity. Pure consciousness is said, then, to become stabilized in the nervous system so that it is never lost, even as the first three states of consciousness—waking, sleeping, and dreaming—come and go. In the following passage, Maharishi (1972) explains this gradual culturing of the nervous system to maintain a style of functioning that simultaneously maintains the inner unboundedness of pure consciousness along with waking, sleeping, and dreaming states of consciousness.

If the influence is found growing with the practice, then there must come a time when full value of fourth state of consciousness could coex-

ist with full value of waking state of consciousness. And this possibility is intellectualized from one factor: that if the rise of the fourth state of consciousness produces very deep rest in the nervous system, much deeper than deep sleep, then if the system is exposed to that state repeatedly, there could arise in the nervous system a habit of maintaining that restful state. The nervous system could become habituated to maintain that state of deep rest, and in that state the mind will maintain full awareness. (Lesson 23)

Life becomes a coexistence of opposite values: all perceptions and experiences in the diverse, changing field of boundaries are accompanied by the direct experience of the silent, unchanging, unbounded field of unity, pure consciousness, within. Transcendental Consciousness, the true nature of the perceiver, the Self, now permanently coexists with the other three states of consciousness. This combined state is a fifth state of consciousness, which Maharishi terms Cosmic Consciousness. The primary characteristic of this state is that inner, pure consciousness is continually maintained, regardless of the changes in outer life. It is this unique style of functioning, Maharishi (1972) explains, that renders this experience a fifth state of consciousness:

That pure awareness which before starting to meditate was completely hidden underneath the influence of the waking state of consciousness, that pure awareness, the state of unbounded consciousness, has come up on the conscious mind. The mind maintains it even when it experiences the boundaries of the rose. So, the awareness of the boundless, which is the nature of pure awareness, and the awareness of the boundaries, this natural and spontaneous situation, this natural and spontaneous character of consciousness is certainly unlike waking, dreaming, sleeping, and the fourth—it's unlike any of these. We have a right to say the fifth state of consciousness. The fifth state of consciousness is a combination, coexistence of any of the three—waking, dreaming, and sleeping—along with the fourth, transcendental. (Lesson 23)

Maharishi (1967) frequently cites another central verse from the *Bhagavad-Gītā* to explain the nature of life, and of action, in this fifth state of consciousness.:

योगस्थः कुरु कर्माणि

Yogasthah kuru karmāṇi

(Bhagavad-Gītā, 2.48)

Established in Yoga, perform action.

Maharishi (1967) begins his commentary on this key verse by explaining that “‘Established in Yoga’ means established in cosmic consciousness.” The individual awareness is unified with the pure intelligence (or “divine intelligence” or “bliss consciousness” or “divine Being”) at the basis of all creation. Then Maharishi (1967) unfolds the essence of this experience.

Yoga, or Union of the mind with divine intelligence, begins when the mind gains transcendental consciousness; Yoga achieves maturity when this transcendental bliss-consciousness, or divine Being, has gained ground in the mind to such an extent that, in whatever state the mind finds itself, whether waking or sleeping, it remains established in the state of Being. (p. 135)

This is not just an abstract experience. Cosmic Consciousness, the fifth state of consciousness, is also the basis of a new style of practical daily action, action while established in Being or pure consciousness. A more recent unfoldment by Maharishi (1997b) of this same verse of the Bhagavad-Gītā focuses upon the support of natural law during the performance of action in this state of consciousness: “*Yogasthah kuru karmāṇi*—established in Being, the home of all the Laws of Nature, perform action fully supported by Natural Law” (v. 2, p. 97). This elaboration is based upon Maharishi’s explanation that Being, pure consciousness, is the “home of all the Laws of Nature”—the unified field of natural law. For that reason, when one is established in this level of pure consciousness, one’s action is “fully supported by Natural Law”—fully supported by the organizing intelligence at the basis of the natural world—so that action flows in the right direction more effortlessly, bringing achievement and success more easily.

Maharishi explains that this silent level of consciousness is a field of all possibilities where the total potential of the organizing power of natural law is always fully awake, fully alert; this is one way of expressing the full awakening of one's inner potentialities in life. It is this silent, omnipresent level of natural law which spontaneously governs the universe, that can be harnessed in individual life. Pointing out the practical value of this point, Maharishi (1995c) explains that it is the resulting quality of action that should be developed in everyone and, therefore, that education should culture the mind and body of everyone so that no one encounters stress, strain, and problems in life (pp. 170–171).

Pure consciousness, the home of natural law that spontaneously governs the universe, is understood to be a field of all possibilities. A person increasingly in harmony with this fundamental level of natural law becomes capable of thought, speech, and action that are increasingly supported by natural law or in harmony with natural law—and are thus more free of problems. Such action, Maharishi (1967) explains, produces entirely life-supporting effects.

Action is here used to mean right action, which produces life-supporting effects for the doer and for the entire creation, action that helps the evolution of the individual and simultaneously serves the cosmic purpose. Such action is possible only when man's mind is in complete harmony with the transcendent Being, which underlies all creation and is the basis of all life and all the Laws of Nature. This is the case in cosmic consciousness. (p. 276)

Thus, Cosmic Consciousness is that state in which one's mind is “in complete harmony with the transcendent Being,” in harmony with that field of life which is the home of all the laws of nature. Activity in Cosmic Consciousness is activity from this level, activity which is spontaneously in accord with natural law, spontaneously right. Because action emanates from the cosmic level of life, the effects of action in Cosmic Consciousness are said to be life-supporting not only for the doer, but also for the entire creation—action that helps the evolution of the individual and simultaneously serves the cosmic purpose. The effects of such action are always life-supporting, and thus, as Maharishi (1967) explains, “untouched by sin.”

“Untouched by sin” means free from any wrong; a life that is completely harmless, being in accordance with the Laws of Nature. This state is gained in cosmic consciousness, in which the Self is completely separate from activity. It is in this state that actions are motivated by the power of nature responsible for all creation and evolution. That is why they all produce life-supporting effects and no wrong is possible. (p. 345)

Action in enlightenment is different from action in a stress-encumbered nervous system: no wrong is possible. Maharishi explains that this state of life results when the nervous system becomes pure, free of stress. Because in this state the nervous system is pure, and pure consciousness is always maintained, one’s thought, speech, and action are in accord with natural law—that is, free of mistakes.

In the preceding quote, Maharishi uses the term Self to refer to the most fundamental level of individual awareness (pure consciousness, Transcendental Consciousness). Maharishi explains that the Self is experienced as separate from activity; action is not directed by the individual ego, but is “motivated by the power of nature responsible for all creation and evolution.” Since pure consciousness (Transcendental Consciousness, the unified field of natural law) is a field of infinite silence, the action motivated by pure consciousness is said to be “action in silence.” Maharishi (1995c) begins an exposition of this point: “It is interesting to analyze self-referral performance—action from the settled state of mind—action from Transcendental Consciousness—action in silence” (p. 170). Maharishi (1995c) continues by explaining the prerequisites for this action in silence. Consciousness must be “fully awake,” so that the full potential of intelligence is engaged, and success can be achieved with the least expenditure of energy.

Action in silence (“Field Effect,” Physics) is action from the level of infinite correlation—from the level of the “field,” where the total energy of Natural Law is utilized to fulfill the intention. Action propelled from this level of silence consumes least energy and utilizes the total organizing power of Natural Law (Principle of Least Action) to hit the target with maximum speed and least resistance. (p. 172)

In this quote, Maharishi has explained in detail the mechanics underlying the phenomenon of action in silence in terms of the basic physical

principle of “least action.” At every level of physical exploration, nature follows the principle of *least action*; every phenomenon in nature occurs with the least possible expenditure of energy. In Cosmic Consciousness, the individual is able to tap into the silent level of natural law that governs the universe; using the organizing power of natural law, one can “hit the target” with least action. Growing in this experience, one notices that action seems more effortless and fruitful.

In addition to this abstract description of action based on silence, Maharishi also discusses the inner experience of the actor while performing action in Cosmic Consciousness: one enjoys inner freedom. In the Bhagavad-Gītā, Maharishi (1967) explains this point in terms of one’s subjective experience of inner freedom: “When one naturally begins to maintain the state of Being in all states of waking, dreaming and deep sleep, then one has attained eternal freedom in divine consciousness” (p. 371).

In Cosmic Consciousness, because one is open to unbounded awareness, one is not only in a state of freedom, but also of inner contentment. One’s source of fulfillment no longer depends upon the outer sphere of life. Instead, it is internal and inviolable—transcendental bliss-consciousness within. Maharishi (1967) explains, “Once bliss-consciousness is permanently attained, desires have served their purpose and therefore cravings do not arise. This is a state of true contentment, a state of lasting peace” (p. 170).

Action in this state is action that is not born of “craving,” but action for the welfare of the world. Action is no longer motivated by narrow individual interest, nor by limitations born of lack of inner wakefulness, as Maharishi (1967) explains in the following passage:

The man who is thus contented in himself certainly continues to act in the world, but his behavior has become natural behavior. It is no longer motivated by selfish desires, nor is its effectiveness disturbed by any shortcomings that might arise from dullness on his part. (p. 209)

This, then, is the distinction of Cosmic Consciousness. Enjoying a life of inner contentment and fulfillment, living life in accord with natural law, performing action that is effortless and right, and with life-supporting effects on all creation, never losing contact with the unbounded field of pure consciousness—one’s own Self—one enjoys the inner freedom of Transcendental Consciousness whether waking, dreaming, or

sleeping. Maharishi, in a lecture given in 1960, referred to this state as the fulfillment of the purpose of life (Maharishi Vedic University, 1986).

When that divinity [pure consciousness] is not overshadowed by the objective experiences of outside, when that oneness of life is not overshadowed by the diversity of the world, then it is lived 100 percent in life—that and this, both taken together, the Being of the transcendent and the experience of the relative world, both hand in hand. When this happens, then the purpose of life is fulfilled. This is cosmic consciousness, when the mind, completely saturated with the state of pure Being, comes back to live in the world of sensory perception. All things are experienced as before, but not, as before, in ignorance of the inner state of Being. Now the full, inner state of Being is lived. It has pervaded the mind. Yet everything in life is being experienced. This state and that, taken together at the same time, is cosmic consciousness. This is the purpose of life. (pp. 290–291)

Because this state of consciousness is characterized by the coexistence of the fields of diversity and unity, or what Maharishi has called the absolute and relative, at the same time, Maharishi has referred to Cosmic Consciousness as a state in which one can live 200% of life: “So ‘full life’ means 200% of life, which means 100% of absolute existence and 100% of relative existence—200% of life” (Maharishi Vedic University, 1986, p. 566).

Cosmic Consciousness, then, is a fully established higher state of consciousness that Maharishi terms a state of *enlightenment*. Because this state is a state of permanently established pure consciousness, a state in which the nervous system is free of stress and one is able to live in accord with natural law in a state of inner contentment and fulfillment, Maharishi explains, the “purpose of life is fulfilled.”

Nonetheless, Maharishi over the course of time has unfolded even higher states of consciousness available in human life. These are states of sequential refinement and development. In 1964, when practitioners of the Transcendental Meditation technique began to report experiences of further refinement, Maharishi brought out and defined a sixth state of consciousness, God Consciousness (Maharishi Vedic University, 1986, p. 577).

Sixth State of Consciousness:

Refined Cosmic Consciousness or God Consciousness

Maharishi establishes several features of greater refinement of consciousness, which together define God Consciousness. Central features of this state of consciousness, Maharishi (1972) explains, are refinement of perception and refinement of feeling. These become possible when the nervous system has been functioning in a natural and pure state for a period of time. The following quote summarizes a discussion by Maharishi (1972) on the development of refinement of perception.

In the fifth state of consciousness where the fourth state of consciousness has come to be coexistent with the waking state of consciousness, the perception is of the surface value of objects. And when the perception becomes so refined that it is able to perceive the finest relative on the surface of the grossest relative, then this will certainly be another state of consciousness distinctly different in its characteristics from the fifth state of consciousness—the unbounded awareness with the ability of perception of the finest relative. We have a right to say a sixth state of consciousness. (Lesson 23)

In this quote Maharishi makes it clear that in Cosmic Consciousness, even though pure consciousness is established permanently within, in the beginning one continues to perceive only the gross, surface level of the physical universe. Over the course of time, however, one's perceptual abilities become refined. At the heart of God Consciousness is the ability not only to perceive the surface level of life, but also to become directly aware of the "finest relative value" of whatever object one perceives. Maharishi defines this state as "unbounded awareness along with the finest relative perception."

At the same time, Maharishi explains that one becomes capable of a more refined level of feeling; devotion begins to grow as a natural expression of this state of consciousness. Maharishi (1967) explains that it is through such devotion, an experience of ultimate inner refinement which grows naturally from the platform of Cosmic Consciousness, that Cosmic Consciousness develops into God Consciousness: "The activity of devotion comprises the feelings of service, reverence and love, which are the most refined qualities of feeling. It is through

the activity of devotion that cosmic consciousness develops into God-consciousness” (p. 315).

The development of God Consciousness enables one to perceive the finest relative level of creation, a level of celestial refinement, to experience the finest level of feeling, devotion—and, ultimately, to realize God. Maharishi has spoken of God as presiding over both manifest and unmanifest: “Pervading the relative is the existence of God, the power of God, God Himself. He stands somewhere between the manifest state and the unmanifest state, presiding over both” (Maharishi Vedic University, 1986, p. 581). The term “Absolute” in the following quote refers to the unmanifest field of pure consciousness, or Being.

That God Almighty is realized when we have the ability of perfect Being and the greatest ability of finest perception in the relative field. Our ability of perfect Being means cosmic consciousness, where we live that Absolute which permeates and pervades all relative fields of life. When we gain cosmic consciousness and when we gain the finest ability of perception in the relative field, then we acquire the ability of realizing what we call God. So cosmic consciousness is the first prerequisite to God-realization. (Maharishi Vedic University, 1986, p. 581)

In *Cosmic Consciousness*, Maharishi (1967) explains, one experiences life in duality—as inner pure consciousness, the Self, and as outer diversity. These two fields of life are experienced simultaneously, but the two are experienced as separate from each other (pp. 342-344). In *God Consciousness*, Maharishi makes clear, the duality grows less, as one begins to perceive the finest relative, to experience the most refined growth of the heart, devotion, and ultimately to realize God:

Then the God is lived through every experience. Then what one sees is the expression of God, what one hears is the manifestation of God. Through all the senses of experience, God is experienced. That which presides over the Absolute comes to be lived and experienced on the level of the senses, and this is the vision of God-realization. God is found to be nowhere else other than where we are found. God is seen at no other level than what we are seeing. At every level of experience, what is experienced is God. (Maharishi Vedic University, 1986, p. 584)

As Maharishi points out, in God Consciousness, “God is found to be nowhere else other than where we are found.” This is the culmination of God Consciousness. Over time, Maharishi indicates, devotion, which plays such a significant role in the development of this state, also plays a role in bringing the ends of the continuum of life, the inner transcendent Self and outer activity, into perfect union. In this unifying process, Maharishi (1967) indicates, devotion “finds fulfillment in its own extinction.”

While devotion served as a link to maintain Union, this remained in some degree on the level of formality. The formality of worship is a pleasure that overtakes the devotee’s heart and his whole being, which gives meaning to his life and glorifies it on all levels; but the joy of such devotion is the joy of Union at a distance. As the Union grows more complete, the link of worship, of adoration and devotion, finds fulfillment in its own extinction, leaving worshipper and worshipped together in perfect oneness, in the oneness of absolute Unity. (pp. 447–448)

Seventh State of Consciousness:

The Unity of Subject and Object in Unity Consciousness

In the fulfillment of this union, which Maharishi terms a seventh state of consciousness, Unity Consciousness, the duality of life is dissolved. Not only do “worshipper and worshipped” become united, but gradually all objects of perception come to be experienced in terms of their infinite basis in pure consciousness, Transcendental Consciousness, the Self. Thus knower—consciousness—and known—objects of perception—come to be unified, both experienced in terms of the infinite, unmanifest level of life. In Cosmic Consciousness the experience of duality is marked: one experiences the infinite, unmanifest field of consciousness within, one’s own Self, while at the same time experiencing the outer, finite field of change, or diversity, the relative field of life. In God Consciousness, the experience of duality continues, but with less contrast: one maintains the connection with the infinite field of pure consciousness, while experiencing the outer field of life in terms of its most refined values—what Maharishi has called celestial values. In Unity Consciousness, experience grows beyond the finest level of relative life to encompass the inner, infinite value of the “external” object.

Therefore, knower and known become unified on the level of the infinite value of life. Now the outer sphere of life is also experienced in terms of the infinite field of consciousness at the basis of all life. In a lecture on the seven states of consciousness, Maharishi (1972) explains that, in Unity Consciousness, perception unifies the subject and object in their unbounded, infinite status; unity becomes a living reality.

The seventh state of consciousness, we may very well call unified state of consciousness, where the ultimate value of the object, the infinite, unmanifest, ultimate value of the object breathes life, or becomes lively. When the conscious mind being lively and vibrant in the unbounded value of awareness falls onto it, the object is cognized in terms of the pure subjective value of unbounded, unmanifest awareness. This cognition rising to the infinite value gives a status of the seventh state of consciousness. Beyond that there does not seem to be any possibility of growth of consciousness because the experiencer, and the object of experience, and the entire phenomenon of perception, which is also the phenomenon of action, has been brought on the same level of infinite value. (Lesson 23)

The object is now “cognized in terms of the pure subjective value”—as one’s own Self. As Maharishi explains, in Unity Consciousness, the process of perception itself serves to enliven the transcendental field permeating the finest relative. Maharishi (1972) speaks of the awareness in Unity Consciousness breathing life into the object of perception:

When the conscious mind falls onto the perception of the finest relative, when the unbounded awareness of the conscious mind falls on the boundaries of the finest relative, the unmanifest value which is permeating the finest relative value becomes lively, and that liveliness of the transcendental value of the object is nothing other than the liveliness of the unbounded value on the level of the conscious mind. And when the conscious mind, by way of perceiving, falls on the object, the likeness of the nature of the object in that lively unmanifest value, on the supreme relative value—that liveliness, and this liveliness of the conscious mind—they have the same character. And this enlivens the unmanifest value, which until now was only permeating the object but was not open to awareness. That liveliness of the omnipresent, absolute, unmanifest value of the object begins to breathe life with the value of the conscious mind falling onto the object. Certainly, this value of cog-

nitition has a different characteristic from that value of cognition which cognizes the finest relative. (Lesson 23)

Unity Consciousness:

The Realization of Everything in Its Infinite Value

The experience of the unity of the inner Self, the subject, with the object of perception, which is also experienced in terms of its “omni-present, absolute, unmanifest value,” is the beginning of the realization that *everything* is unified at its basis. Maharishi (1972) makes it clear that the field of diversity continues to be experienced as diversity; that is, one continues to be capable of functioning properly within boundaries. Only one is able to simultaneously experience the underlying unity, the unity of one’s inner nature and the outer world.

In the following quote, Maharishi also establishes that the infinite, unbounded field of pure consciousness pervades every part of one’s own individual life, from its subtlest levels to the most expressed; the subtlest part of individuality, the ego, then the more expressed values, the intellect, mind, senses, the body, and, finally, the whole field of objectivity—all are expressions of, and all begin to be experienced as, one’s own infinite, unbounded Self.

Even when we are experiencing the outside, objective world, even when we are experiencing moods of the mind and all that, even then we are not out of the realm of the Self, because the Self is pervading the ego, pervading the intellect, pervading the mind, pervading the senses, pervading the body, pervading the whole objectivity. All this is nothing but manifestations of the same Self. (Maharishi Vedic University, 1986, pp. 255–256)

As one grows in the knowledge and experience that all life is “nothing but manifestations of the same Self,” one grows, Maharishi explains, in the full value of Unity—Brahman Consciousness—which Maharishi calls the ultimate state of awakening (1997a, v. 1, p. 153).

Brahman Consciousness

Because Brahman Consciousness is a state of fully ripened Unity Consciousness, it is not considered a separate state of consciousness. The

reality of Brahman Consciousness can be appreciated from the perspective of key verses from the *Yog-Sūtra*. We have established the nature and character of the field of consciousness by exploring the phenomenon of the self-interacting dynamics of consciousness. Due to its self-interaction, vibrations—unmanifest sounds, the sounds of Veda and Vedic literature—arise within consciousness. These vibrations are also called *frequencies* or *impulses* or even *tendencies*. The two *sūtras* from the *Yog-Sūtra* cited frequently by Maharishi in descriptions of the mechanics of self-referral consciousness are verses 1.3 and 1.4. These verses bring out both the establishment of the knower in the Self and also the nature of the Self as impulses or vibrations—in Sanskrit *Vṛitti*—which emerge from the field of consciousness knowing itself. These two verses from *Yog-Sūtra* are:

स्वरूपे अवस्थानम्

Swarūpe avasthānam

(*Yog-Sūtra*, 1.3)

वृत्तिसारूप्यमितरत्र

Vṛitti sārūpyam itaḥ atra

(*Yog-Sūtra*, 1.4)

Maharishi (1996a) has translated these verses, “The observer is established in himself, in the self-referral state of consciousness; and the impulse, *Vṛitti*, of self-referral rises from it and remains within it” (p. 539). In citations and translations of these two verses, Maharishi brings out and clarifies the nature of the field of consciousness. Verse 1.3 could serve as a description of Transcendental Consciousness or of Cosmic Consciousness (depending upon whether one is established temporarily or permanently in that state): “The observer is established in the self-referral state of consciousness.” Verse 1.4 establishes that the impulses of consciousness—which, as we have seen, are the basis of all diversity—emerge from this field of consciousness *and remain within* self-referral consciousness.

In waking state of consciousness, there is no awareness of either of these experiences; one experiences only the changing, relative sphere of life. In Transcendental Consciousness, one experiences pure consciousness, one's unbounded Self. In Cosmic Consciousness, one identifies with, and is permanently established in, this field of unbounded consciousness, one's Self. Only in Unity does one experience the impulses, which arise within the Self. The fully established state of Unity Consciousness, Brahman Consciousness, confers the experience of the full reality of life expressed in *Yog-Sūtra* 1.4: the universe is experienced as impulses of self-referral consciousness, and one realizes that those impulses not only arise from but also remain within one's own self-referral consciousness. What earlier appeared as an independent world of forms and phenomena is now experienced as impulses or fluctuations of pure consciousness, fluctuations of one's own Self. There is no separation of the Absolute and the relative, of the Self and the non-Self, as in Cosmic Consciousness; as Maharishi (1997a) makes clear, the impulses "emerge from here" and "remain here" in self-referral consciousness, in one's Self.

In this supreme state of enlightenment the full potential of the Self is wide-awake, and the whole universe is experienced as nothing other than the impulses of the Self, the Absolute. The impulses of the Self are the Vedic Hymns, which are the seeds of the whole creation. (v. 1, 149)

This quote establishes not only the experience of the whole universe as the Self, but the whole universe as the "*impulses* of the Self," which are the "Vedic Hymns"—the sounds of the Veda and Vedic literature. We have seen that the whole universe, including the individual human being, emerges from the fluctuations of Veda. Now we find that, on the way to full realization, comes the experience that one is the impulses of the Self, the Veda. Certainly, the creation comes out of Veda, but also, a human being, in the process of attaining full enlightenment, experiences the flow of life in the reverse direction and discovers, Maharishi (1997a) indicates, that "I am Veda."

The creation came out of the Veda; and वेदोऽहम् *Vedoham*—'I am the Veda'; अहं ब्रह्मास्मि *Ahaṁ Brahmāsmi*—I am ब्रह्म *Brahm*—is the complete picture of the possibility of human culture, where man has the

universe within himself, not only in his awareness, but in the practical ability to create anything. (v. 1, pp. 149–150)

As Maharishi points out, the realization “I am Veda” and “I am Brahm” belong to the highest level of realization in life. Regarding the attainment of this highest level, Maharishi’s discussions become increasingly subtle and detailed. In the following quote, Maharishi explains the role of the intellect in the development of enlightenment: the intellect becomes intelligence. Maharishi has described the *intellect* as that very refined aspect of one’s subjective nature, which distinguishes and decides; it is the faculty which discriminates, which chooses between this or that. But here Maharishi (1995b) describes the *intellect* as “becoming” intelligence—becoming pure intelligence, pure consciousness, the field of Unity itself.

The field of the intellect is the field of duality, the field where the subject and the object are separate. In the field of the intellect diversity dominates. Only in the state of enlightenment, where the intellect becomes intelligence, are the subject and object unified, and the field of duality begins to breathe the freshness of Unity. (p. 365)

Then Maharishi unfolds the elements of realization that constitute Brahman. Maharishi points out the subtle distinction in the development of consciousness when one’s experience evolves from knowing Veda as an *object*—even within the field of unmanifest consciousness—and knowing Veda as one’s own Self. In the following quotation, Maharishi explains the steps of realization that mark the progress toward and establishment of Brahman.

Veda is the impulses of one’s own consciousness, but this could be observed by the observer, the Self. When the Veda is observed, then it is not involved with the observer—the observer, the Self, is separate from it. But when the total Veda is completely and fully awake in one’s awareness, then *vedoham*—“I am the Veda,” and this is Vedanta—the awakening that identifies oneself with the Veda. As long as Veda is being appreciated by the Self, so long the Self remains a witness to its own impulses. And when the Self has been completely identified with that, then there is no Veda. What remains is the Self, wholeness—the

awakening to one's own reality, *ahaṃ brahmāsmi*—"I am the totality."
(Maharishi Vedic University, 1986, pp. 573–574)

The two progressive stages in the development of Brahman, as outlined by Maharishi, are the following: 1) The Veda is observed—"the observer, the Self, is separate from it," or "the Self remains a witness to its own impulses,"—I know Veda. 2) The Self is completely identified in Veda—the "total Veda is completely and fully awake in one's awareness,"—I am Veda. In fact, as Maharishi points out, in the full identification of Self with that, "then there is no Veda." One awakens to one's own reality—I am Totality. Maharishi (1995b) refers to each of these realizations in the following discussion of regaining wholeness in Brahman Consciousness.

अहं ब्रह्मास्मि

Ahaṃ Brahmāsmi

(*Bṛihad-Āraṇyak Upanishad, 1.4.10*)

I am Totality.

The experience in this state is *Vedoham* and *Vedaham*—*I know Veda, I am Veda.*

The reality of the Veda is the reality of Being, the Self, which can only be perceived for its total value by the enlightened intellect, where the intellect becomes intelligence—the ground state of all the laws of nature. "Becoming" reverts back to "Being"—the process of the Self becoming the intellect is reversed when the intellect realizes itself in terms of its source—Unity—Totality—WHOLENESS. (pp. 365–366)

Maharishi thus describes the process of enlightenment as a process of reverting back to Being. We may recall that Maharishi Vedic Science describes the universe arising from consciousness knowing itself; in this process, the intellect distinguishes between knower, knowing, and known, thus creating conceptual divisions within consciousness which interact with each other. This self-interacting process gives expression, first, to Vedic Sound, and then, to the human physiology and the entire

creation. In the quote above, we see the process is now turned around as the human intellect begins the reverse process, becoming unified with its source, pure intelligence—pure consciousness. “Becoming”—the field of diversity, space and time, characterized by constant change, constant evolution—is now reversed to its source in Being—in changeless, eternal, pure existence, pure consciousness—in Unity, Totality, wholeness.

In a further elaboration of this point, Maharishi indicates that, in the process of “Becoming,” the Self, pure consciousness, first appears in the sounds of the Veda and then in the structure of physical creation. Once one understands the mechanics of the unfoldment of consciousness, the Self, first, into Veda and, then, into the universe, then one is equipped to comprehend, at least intellectually, that full enlightenment—which Maharishi calls Total Knowledge—encompasses the reintegration of these elements into one seamless wholeness of life, the Self. In the following quotation, Maharishi (1994) uses the term *Ātmā* for the most fundamental level of individual life, the Self.

The search for total knowledge starts from the Self (*Ātmā*) and proceeds on to the expressions of (*Ātmā*)—the Veda, and *Vishwa* (the universe)—and from knowledge of the universe to the knowledge of totality, *Brahm* (the Self), which is the unified state (togetherness) of the knowledge of the universe, the knowledge of the Veda, and the knowledge of the Self—the blossoming of total knowledge in the Self—the goal of all knowledge (*Brahm*) found in the Self, where the path of gaining knowledge began. (p. 44)

In this quotation, Maharishi implies a distinction between, on the one hand, the elaboration of the Self (*Ātmā*) into Veda and *Vishwa* (the universe) and, on the other hand, *knowledge* of all the details of this process within the human awareness. Thus, *Brahm* (Brahman Consciousness) involves “knowledge of the universe, knowledge of the Veda, and knowledge of the Self.” This is the fully established pinnacle of Unity Consciousness—Brahman.

In other discussions, Maharishi makes this point from a somewhat different angle. In the following quote, Maharishi (1995a) begins by reviewing the “spontaneous expansion” of *Ak*, the seed expression of Veda, into Veda and *Vishwa* (the universe), which constitutes the process of expan-

sion of consciousness into increasingly elaborated forms. The spontaneous expansion of *Āk* into the Veda and Vedic literature is actually the analysis of *Ātmā*; furthermore, the expression of Veda into *Vishwa* is actually the continuous process of expansion (evolution) of *Ātmā*.

Maharishi focuses upon not only analysis, but synthesis. The path of knowledge—the path of enlightenment—begins and ends in the Self. Maharishi (1994) explains that the path of knowledge proceeds from the Self to the expressions of *Ātmā*—the Veda and *Vishwa*, or the universe—and then to Totality, *Brahm*.

Brahm represents the unity of knowledge of the universe, knowledge of the Veda, and knowledge of the Self (pp. 43–44). In the dawning of complete enlightenment, the “inner content” of the Self is revealed: *Ātmā* (the Self) awakens to its own inner nature and structure. In the following quotation, Maharishi uses the term *Mantra* to refer to the sounds of the Veda and *Brāhmaṇa* to refer to the gaps between these sounds in explaining the analysis of *Ātmā* and the nature of its “inner content” awakened in *Brahm*.

It is clear that Veda and Vishwa—the structure of knowledge and its organizing power (the Veda—*Mantra* and *Brāhmaṇa*), and the extension of Veda in the structure of the universe (*Vishwa*)—is the inner content of *Ātmā*; the structure of knowledge and the structure of the universe is the inner nature of *Ātmā*—*Ātmā* awake in itself in terms of Veda and *Vishwa* is *Brahm*—Totality:

अयम् आत्मा ब्रह्म

Ayam Ātmā Brahm

(*Māṇḍukya Upanishad*, 2)

This Self is Brahm. (p. 409)

The “inner content” of *Ātmā* is the structure of knowledge (Veda) and the structure of the universe (*Vishwa*). For the ultimate awakening, *Ātmā* must be “awake in itself in terms of Veda and *Vishwa*.” As we have seen, *Yog-Sūtra* 1.4, states that “The impulses of consciousness emerge from here (the self-referral state) and remain here (the self-

referral state)”; diversity *is* unity; everything is one’s Self. In Brahman Consciousness, the individual has direct awareness that *Ātmā*, Veda, and *Vishwa* constitute one wholeness of life. Moreover, this detailed and comprehensive way of understanding the knowledge one gains in Brahman Consciousness is based upon memory: life is one integrated wholeness of unity and diversity which is my own Self—*Ātmā* with the total *memory* of Veda and *Vishwa* within. Thus Dr. Tony Nader (1995) ends his commentary on Brahman Consciousness with the summary: “This *Ātmā* — *Ātmā* with the total memory of Veda and *Vishwa* within it—is Brahm, the totality—*Ayam Ātmā Brahm*” (p. 15).

Mastery of Knowledge and Mastery of Natural Law in Unity Consciousness

The experience of Unity Consciousness, of life in wholeness, constitutes the highest fulfillment of consciousness, and, at the same time, the highest fulfillment of knowledge. Ontology and epistemology (and cosmology) are united in the highest level of experience in life; consciousness, or Being, and knowledge are ultimately inseparable. The following summary of a lecture by Maharishi (1972) makes clear that the full value of consciousness is also the full value of knowledge.

The object is being verified in its total reality when the infinite value of the object, which hitherto was underlying, has come up to be appreciated on the surface. Then the perception is of supreme value. The perception is of ultimate value when the perception opens the infinite value of the object to the awareness. Then the perception is total. When the perceiver, the knower, is able to know the object in its completeness, then the complete value of knowing is in function. Then the full value of knowledge has been gained, and in this state knowledge is complete, full.

Maharishi (1997a) summarizes the attainment of the highest level of knowledge—the ultimate state of awakening—by bringing out the practical outcome of living this state of consciousness and knowledge: “The quest of knowledge ends in the ultimate state of awakening, Brahman Consciousness, in which the knower realizes that everything is himself. The test of this state lies in the ability to create all possibilities from within the Self” (v. 1, pp. 153–154). The realization that “I am

Totality,” therefore, is not only a state of knowledge, but also a state of mastery of natural law. The ability to “create all possibilities”—or “the practical ability to create anything within one’s own Self”—serves as a test of this state of consciousness.

Scientific Research on Higher States of Consciousness

More than 600 studies document evolution toward higher states of consciousness resulting from application of the technologies of Maharishi Vedic Science. Research has reported subjective experiences and physiological patterns of the fourth and fifth states of consciousness. These findings are included in the last section of this volume. These studies verify the understanding that each state of consciousness is accompanied by a unique set of physiological correlates. Future research will be necessary in order to define and clarify physiological correlates of the highest states of consciousness, God Consciousness and Unity.

The body of research as a whole tests, validates, explains, and verifies in objective terms both the predictions made by Maharishi regarding the effects of the fundamental technologies of Maharishi Vedic Science and also the subjective reports of millions of people around the world who have been instructed in these technologies. Studies have been done on brain functioning, academic performance, IQ, and indicators of health, social behavior, job performance, and environmental influence, as well as effects in other, more specialized areas, such as rehabilitation—and even studies on advanced technologies of Maharishi Vedic Science and the effect of these technologies on societies as a whole.

References

- Egenes, T. (1989). *Introduction to Sanskrit: Part One*. San Diego, California: Point Loma Publications.
- Maharishi Mahesh Yogi. (1967). *Maharishi Mahesh Yogi on the Bhagavad-Gita: A new translation and commentary, Chapters 1–6*. New York, NY: Penguin Group.
- Maharishi Mahesh Yogi. (1972). *The Science of Creative Intelligence: Knowledge and experience* [Transcript of videotaped course]. Los Angeles: Maharishi International University Press.
- Maharishi Mahesh Yogi. (1994). *Maharishi Vedic University: Introduction*. Vloderp, Netherlands: Maharishi Vedic University Press.

- Maharishi Mahesh Yogi. (1995a). *Maharishi's Absolute Theory of Government: Automation in administration*. India: Maharishi Prakashan.
- Maharishi Mahesh Yogi. (1995b). *Maharishi forum of natural law and national law for doctors*. India: Age of Enlightenment Publications.
- Maharishi Mahesh Yogi. (1995c). *Maharishi University of Management: Wholeness on the move*. India: Age of Enlightenment Publications.
- Maharishi Mahesh Yogi. (1995d). *The science of Being and art of living*. New York, New York: Penguin Books USA Inc.
- Maharishi Mahesh Yogi. (1996). *Maharishi's Absolute Theory of Defence: Sovereignty in invincibility*. India: Age of Enlightenment Publications.
- Maharishi Mahesh Yogi. (1997a). *Maharishi speaks to educators: Mastery over natural law*. India: Age of Enlightenment Publications.
- Maharishi Mahesh Yogi. (1997b). *Maharishi speaks to students: Mastery over natural law*. India: Age of Enlightenment Publications.
- Maharishi Mahesh Yogi. (1997c). *Celebrating perfection in education: Dawn of Total Knowledge*. India: Maharishi Vedic University Press.
- Maharishi Vedic University. (1986). *His Holiness Maharishi Mahesh Yogi: Thirty years around the world—Dawn of the Age of Enlightenment*, Vol. 1, 1957–1964. Vloderp, Netherlands: Maharishi Vedic University Press.
- Māṇḍūkyaopaniṣad*. (1982). Madras, India: Sri Ramakrishna Math.
- Nader, T., M.D., Ph.D. (1995). *Human physiology: Expression of Veda and the Vedic Literature*. Vloderp, The Netherlands: Maharishi Vedic University.
- Roth, R. (1994). *Maharishi Mahesh Yogi's Transcendental Meditation*. New York: Donald Fine, Inc.
- Wallace, R. K. (1986). *The Maharishi Technology of the Unified Field: The neurophysiology of enlightenment*. Fairfield, Iowa: MIU Neuroscience Press.

This article, "Higher States of Consciousness in Maharishi Vedic Science," by Patricia Oates, Ph.D., here revised/updated, and reprinted with permission, was accepted as part of her dissertation for a Ph.D. in Maharishi Vedic Science at Maharishi University of Management.

**Experiences of Growth of Consciousness
in Undergraduate Students
at Maharishi University of Management**

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ABOUT THE AUTHOR

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A B S T R A C T

Throughout the ages, the wise have recognized the unity of existence and sought to live this amidst the diversity of life. Today, with knowledge of the natural world fragmenting into highly specialized fields of study, wise educators are seeking ways to unify knowledge, both intellectually and experientially (Boyer, 1987; Chickering, 1981; Neville, 1989). Consciousness-Based education—founded by Maharishi Mahesh Yogi and based on his application of Vedic Science—offers a profound and practical means to achieve this goal. Central to Consciousness-Based education is development of the full potential of every student—their intelligence, creativity, happiness, maturity, and wisdom—through growth of higher states of consciousness.

Introduction

In his widely-read book on college education in the U.S., Ernest Boyer (1987) commented that: “Beyond diversity, the college has an obligation to give students a sense of passage toward a more coherent view of knowledge and a more integrated life” (p. 68). He also remarked that: “The college experience should prepare students to see beyond the boundaries of their own narrow interests and discover connections that are global” (p. 296). Boyer notes that this same theme was brought out in the 1945 *Harvard Report on General Education*, known as *The Red Book*, which pointed to two sides of knowledge: “On the one hand, a need for diversity . . . and on the other, a need for some principles of unity, since without it . . . even the studies of any one student are atomic or unbalanced or both” (as cited in Boyer, 1987, p. 66).

The research reported, in part, in this chapter looks at how education can directly develop these qualities of coherence, integration, and unity of knowledge and experience. The research is drawn from a study of self-development in a group of 140 undergraduate students at Maharishi University of Management, the pioneering institution of Consciousness-Based education (Brown, 2008). Students’ descriptions of experiences of growth of consciousness, reported as the main content of this chapter, were gathered as part of a more extended research study. These experiences are based on the students’ practice of the Transcendental Meditation technique, the key technique for developing inner potential applied in Consciousness-Based education. The intent of the study from which the descriptions are drawn was evaluative and assess-

ment-oriented—an endeavor to respond to questions such as: Who are these students? What is their experience? How do they grow? It is thus in an established tradition of naturalistic research, widely used in educational settings—in these settings, true experimental design using control groups and randomization, while giving a high degree of confidence in interpretation of results, can create an artificial situation that itself has an impact on student experience (Astin, 1991, p. xii).

A scholar in the field of higher stages of human development (Cook-Greuter, 2000) has commented that: “A combination of personality tests, self-assessment . . . as well as physiological and other measures” (p. 237) is needed to ascertain higher stages of individual growth. Guided by this, and by previous studies on human development and the Transcendental Meditation technique (Chandler, 1990; Alexander, Rainforth, & Gelderloos, 1991; Chandler, Alexander, & Heaton, 2005), a combination of measures was used in the research discussed here, based on the University’s assessment of its general education goals.

General education goals go beyond learning goals of specific disciplines, and are relevant to the curriculum as a whole and to the student’s growth as a human being. As part of assessing such goals, undergraduate students at Maharishi University of Management—in their freshman year and again in their senior year (shortly before graduating)—complete a range of tests including an Experience Questionnaire on growth of consciousness and assessments relating to health, critical reasoning, constructive thinking, moral reasoning, and self-development as measured by Loevinger’s ego development Washington University Sentence Completion Test (Loevinger & Wessler, 1970; Loevinger 1976; Cook-Greuter, 1999/2000). Data from three of these assessments was used in the research discussed here: the Experience Questionnaire (self-assessment), Loevinger’s ego development questionnaire, and the Constructive Thinking Inventory (Epstein, 2001).

These measures were chosen to bring to light students’ ability to unify and integrate diverse branches of knowledge and experience, both intellectually and in their own lives, and as a result to act with greater balance and success—indicators of growth of maturity, wisdom, and effective action. In Maharishi Vedic Science, these unifying capacities are understood and practically developed primarily through the field of knowledge known as Yoga (Maharishi, 1967, 1997; Nader, 1994),

from which the Transcendental Meditation technique and its advanced practices are drawn. The word Yoga means union, and refers to union or integration of all aspects of individual life (mind, body, behavior, and sense of self), union of individuality with universality (individual self with an expanded, inner, unbounded experience of Self) and union of inner silence and peace with dynamic action. Growth of higher states of consciousness in Maharishi Vedic Science is described as a process of becoming “perfected in Yoga” (Maharishi, 1967, p. 311). Yoga is at once a state of silent inner unity, and the path to integrate this state with outer, active life (Maharishi, 1967).

The empirical results of the research from which this chapter is drawn give a context for students’ descriptions of their experiences. Analysis of ego development questionnaires from freshmen and senior years revealed a significant increase in ego development ($p = 0.04$), with the mean developmental stage shifting from Self-Aware (freshmen) to Conscientious (seniors). While these two stages, which are within the conventional range of development, are typical of adults in the population as a whole, growth during the undergraduate years has not consistently been seen in research on student groups at other universities (Loevinger, Cohn, Bonneville, Redmore, Streich, et al., 1985; Cohn, 1998; Mentkowski, Rogers, Deemer, Ben-Ur, Reisetter, et al., 1991). As seniors, 29.2% of the students were at higher, postconventional ego developmental stages, compared to approximately 10% of the general population. Even as freshmen, nearly 20% of the students were at post-conventional stages, indicating that the University attracts an already highly developed group. This could have been expected to make further growth less likely, as it is generally considered that growth levels off after the high-school years, especially in young people who have already reached the Self-Aware or Conscientious stages (Loevinger et al., 1985; Cohn, 1998).

Three sub-scales of the Constructive Thinking Inventory chosen to assess growth of effective behavior and action also increased significantly in the student group as a whole (Global Constructive Thinking, $p = 0.001$; Behavioral Coping, $p = 0.004$; Emotional Coping, $p = 0.002$). The students’ scores on these scales, both as freshmen and as seniors, were above the mean for the general population (Brown, 2008; Epstein, 2001).

The Experience Questionnaire used in this study, designed by Maharishi University of Management researchers, includes a quantitative rating that invites students to self-evaluate frequency of three types of experience of growth of consciousness, and also an opportunity to describe examples of these experiences. Two of the quantitatively rated scales increased significantly from freshmen to senior years (Transcending, $p = 0.004$; Witnessing sleep, $p = 0.002$). Students' descriptions of their experiences from these questionnaires form the main body of this chapter.

This empirical data, along with numerous prior studies (reviewed in *Summary of Research on Consciousness-Based Education*, 2001), supports the value of applying Consciousness-Based education in undergraduate education, as a way to promote unifying and integrating capacities, and thus support students' self-development—the basis for developing leadership, and the ability to contribute to balance and peace in society.

Students' Experiences of Higher States of Consciousness

Students from six senior classes (1999 to 2004) completed the questionnaires quoted below. Selection for the study was based solely on students having completed an ego development test (the primary empirical measure) as freshmen and again as seniors. Of the 140 students for whom this criterion applied, 126 had also completed Experience Questionnaires. Students were included regardless of age, mother tongue (the University has a wide range of international students), major field of study, time spent at the University, or eventual graduation. Questionnaires by seniors, rather than by freshmen, were used due to the fact that a large percentage of these students learned the Transcendental Meditation technique only days or weeks before completing their freshmen assessments, and therefore could not be expected at that stage to report extensively on experiences.

Although some selection from the descriptions written by these 126 students has been necessary, no reference has been made in this process to the quantitative data; that is, the descriptions included here are not selected from students quantitatively rated as more "highly developed" than others.

To preserve freshness of expression, syntax and, in general, punctuation have been preserved as in the original. Changes have been made

only when the meaning was hard to grasp, keeping in mind that these descriptions are handwritten in a short time; students aren't given time to refine and edit their writing. The experiences are organized to reflect themes from the literature of Vedic Science, including the texts of Yoga, the Bhagavad-Gita (Maharishi, 1967) and the *Yoga Sutra of Patanjali* (Shearer, 1989), both of which define experiential qualities of growth of consciousness, extensively discussed in Maharishi Vedic Science.

Expressing abstract inner experiences in words can be challenging, including experiences during, and as a result of, practice of the Transcendental Meditation technique. As with any language use, students' ability to find words for their experiences varies. Over many years of guiding students and training thousands of teachers, Maharishi developed a precise terminology. Students are exposed to this in learning the Transcendental Meditation technique and studying at the University. In inviting students to describe their experiences, a balance has to be struck between supporting use of a meaningful vocabulary, and unduly *leading* students to identify particular types of experience. If a questionnaire simply asked students to: "Please describe your experiences during and after meditation," some would be at a loss where to start. For this reason, and to help facilitate classification of students' reflections, the questionnaire describes three possible categories of experience and asks the student to rate and describe experiences similar to this. The wording of the three questions is included below at the start of each section. Most of the students seem well able to express themselves originally, sometimes consciously searching for words to do justice to their experiences. Familiar analogies—for example, that of the mind being like an ocean or a pond, with the inner process of transcending likened to diving—may be given a fresh rendering. Reading these descriptions brings the students alive as fresh, creative, forthright individuals.

Transcendental Consciousness

When inviting students to describe the experience of transcending—defined in the literature as the inner state of Yoga, or union—the questionnaire uses the following terms:

During the practice of Transcendental Meditation, or at any settled, quiet time, have you experienced a perfectly peaceful state in which the

mind is very awake, but still—a state in which awareness seems expanded beyond boundaries of thought, beyond limits of time and space?

All except four of the 126 students wrote a comment in response to this question, including two who said their experiences were private and they didn't wish to describe them further. Five marked "0" on the numerical scale (two of these added the comments "maybe" and "I don't remember").

Many students said that their experience of transcending depended on being well-rested and following a good daily routine, whether this occurred during or after holidays, or after a long weekend. These descriptions are included below only if they contain an additional reflection on the experience. It is interesting to note that for these students, personal experience validated the purpose of the regular, balanced daily routine recommended by the University.

In the first two comments, students reflect on the process of giving verbal expression to inner experience. (Throughout this section, each student's experience is in a separate indented paragraph):

Well, the question makes it sound a little dramatic—"beyond the limits of time and space." It's more simple than words do it justice. I realize that I had been transcendental, and it's incredibly appealing. It only happens spontaneously. In other words, you can't try to get there, but there is a very familiar "not trying" that makes it easy. No flowery language can adequately describe the experience: it is simple and blissful, and makes me feel clean and refreshed, like after bathing in a cold lake.

Several students commented on the inadequacy of words to describe their experiences:

Unbounded, something that cannot be put into words. Whatever I would say, it will be not enough to fully describe it.

I know I've had this experience, but it was so abstract that it defies description.

It's hard to put this experience into words. It is a feeling that I exist. That while I am an individual, I am not alone, but part of something

huge. I am aware of nature, perhaps what would be called the unified field, but I am also aware of my body and my self.

Among those feeling that words could not do justice to the experience, some nevertheless express themselves with originality and precision:

Sometimes I have this experience throughout the entire meditation and sometimes only for shorter periods during the meditation. I find it hard to explain in words. It is like total expansion, the entire universe, it has nothing to do with me specifically, it is just totality. I assume it is w/in me but it feels like I am it.

This is a very simple, silent experience that is, truthfully, ineffable, for it is not an experience but simply Is.

I think I only recognized it in hindsight. I would start by noticing the evidence and then it occurred like a flash of memory. It was a nothingness but still occupied space. It was perfectly calm but charged with energy. It's hard to describe the intangible other than to call it infinite in all ways.

Other students use their own vocabulary, perhaps from a religious perspective:

Often I have experienced this state of silence—it is hard to recall specific moments or times because most of these times are sacred & best not analyzed or talked about, for me personally. However, this has happened to me, & it is an unbounded connection of love & devotion & oneness with everything around me—my individuality is drowned in the Ocean of God's love.

Settled state of silence and peace:

“Yoga is the most settled state of mind” (Yoga Sutra, 1.2)

The quality of silence and peace central to the nature of Transcendental Consciousness as the unifying state of Yoga comes through clearly in students' descriptions:

During TM I feel a sense of extreme silence and peace with my self. A sense of serenity comes over me and I feel at ease.

A deep feeling of peace, something different than anything else I've ever experienced. Lightness, calm, comfort, happiness.

It's like a feeling of settling or converging. Then it is quiet—well really it's beyond quiet—it's still.

During meditation, when I am well rested, I often feel cradled, wrapped in a safety of warmth. My mind is warm & relaxed & I feel completely safe calm and serene.

The word safe comes up in several other descriptions of settled peacefulness—an original expression, as this word is not commonly used in discussing experiences:

In most of my meditations, I experience either a clear profound peaceful state or some sense of that experience. This peaceful state runs throughout my entire body and makes me feel relax[ed] and safe.

It feels very still—whenever there's a chance for quietening, I feel silence in me and the surroundings. It's very liberating and safe feeling—feels like I'm not alone/small human being, but connected to everything around me. Especially in meditation I often experience clearly how the mind expands to the infinite. It feels like I'm as big as I can be—but it feels normal to be that expanded. This peacefulness seems to be in the background nearly all the time, but in quietening and meditation it becomes a more tangible experience—experience of existence.

I notice that my mind is very settled, my thoughts are very quiet and indistinct, although clearly perceptible. I have a sense of great quietness and comfort surrounding me—like floating in an ocean that is silent & nourishing. I also have the feeling of being very big—not physically but mentally—which makes me feel totally safe—like I am beyond all problems—like everything else is very small and insignificant. It feels powerful, like I am in control of everything, but w/o any impulse to do or even desire anything. I just enjoy letting everything slip away as my awareness slowly melts outwards.

Another student also combines a description of peacefulness with a unique analogy, while the next one makes original use of the familiar analogy of diving:

One of the best experiences I have is that of total comfort of the body and mind as they are wrapped together in one immovable shield of silence and peacefulness. It's a simple anti experience, a marvellous fullness of emptiness in which the mind flattens and expands as if an invisible horizon line were passing through my temples.

It is like when you are swimming and you enter into the water and go to the bottom of the swimming pool. It is very relaxing as you go deeper and deeper, until you find yourself in complete peace. It is just peaceful and silent time until you realize again that you are in the pool.

Naturalness, simplicity, spontaneity

References to naturalness, simplicity, and spontaneity—unique qualities of the Transcendental Meditation technique—occur frequently:

It is just very natural. Even though I don't feel it all the time, when it happens it isn't flashy or amazing, it is just the way things are supposed to be.

Silence opens up spontaneously. It can't be made, only surrendered to. It's always present and waiting for the mind to quiet down. Once a letting go happens, all is me expanding into infinity.

Unboundedness, expansion, freedom, timelessness

Following are some descriptions of deep peacefulness which also identify this as an experience of inner unboundedness, freedom, and timelessness:

I am free from the worries and limitations of everyday life—I just am, and what I am is bliss. My surroundings, and the presence of my body, are not experienced—just the silent, peaceful wakefulness.

Most of the time when I close my eyes for meditation I immediately settle into that deep state of silence of the mind. My body completely relaxes and I feel awake, and at peace with myself. My first thought after this experience is always the same: "paradise." During my program

most of the time I have experiences of limitlessness, unboundedness, total freedom, and bliss. A feeling of being at home.

There are no thoughts. My body is in complete ease and I even forget that it's there. All my attention is in the present not in the past or future. I'm just aware, at peace—completely. When in that space of peace I have no acknowledgment of who I am as a person. I just am.

Individual thoughts and preoccupations cease to be relevant, suddenly and silently dissolve, and I witness a kind of spreading.

Just simpleness. Openness and self-centered stability (what I perceive) the entirety of all that is and is not. It's blissful and occasionally I'm so settled, I lose all sense of me as an individual person w/ my concerns problems hopes and dreams.

Once in a while I am sitting meditating and I start to realize that I cannot feel most of my body and I feel almost light—like I'm not really sitting, or not really anywhere. It seems that there is no time and I am just being and that is all there is. I kind of would want to stay there forever. I feel like I have been in that meditation room just for a session equal to that of the blink of an eye.

Space and time nonexistent. This experience makes my whole body alive and I feel very refreshed during and after it.

Coexistence of opposites—restful alertness, silence and dynamism, localized and unlocalized

In Transcendental Consciousness, opposite values are experienced as coexisting—the basis of the growing ability to integrate differences. This can be described as restfulness along with alertness, silence with dynamism, unboundedness with localized boundaries, universality with individuality. (The word program refers to practice of the Transcendental Meditation technique and the advanced TM-Sidhi program.)

I feel energized and yet extremely relaxed. So much potential energy, it is unbelievable. The world is my playground, I am silent within myself, where I sit calmly, yet I am ready to go out and act, conquer.

My experience in TM—very silent in nature—not sleepy exactly, definitely awake—just very non-active.

For me, this is just an experience when I feel rested and active at the same time. I feel that I know myself. At the time there is nothing that disturbs me from an outside world, I just am. Happiness and bliss is the experience I have when in that state.

During program, sometimes I have this experience where energy/wakefulness surges up through my being from somewhere deep inside. It is a split second of pure nourishment that comes from pure silence.

For me, TM almost always brings about a greater sense of peace & silence & of a connection with creation in relation to my daily activities. On some, unfortunately less frequent, occasions, this experience is very deep. On even fewer occasions, the boundaries of my body do fade away & that is an incredibly invigorating & liberating experience that is totally serene at the same time.

Just the experience where the awareness is not localized and is not constrained by boundaries, essentially beyond time and space though there is an awareness as well of the locality.

I feel still, solid like the entire planet, but still, floating. I sense a huge distance between myself and anyone or anything around me, as if I am almost alone, or incredibly tiny as well as hugely expanded. Few thoughts if any—but they do not affect my experience at all. I feel I am a witness to existence.

I feel like—as soon as I close my eyes, something sinks inside of me, literally like I've dived into a pool. Often my body seems to disappear, I can't tell what position I'm sitting in because I can't feel any particular part of me. It's so comfortable and rich, my body craves this feeling of openness and expansion—that's the word I'd use, expansion.

I feel weightless, as if myself and my surroundings have become devoid of all space/time factors. There is a nothingness, not emptiness, but a pregnant void which both fills my being and my surrounding, until I feel like there is not differentiation between the two.

It feels like what a section of a river would feel, if it had feelings: a realization that it is the river yet also the river is flowing through it. The only thing to do at such moments is just to experience the experience because it is really nice and you don't desire to do anything even though it's almost like no experience at all.

Growth of silence coexisting with thoughts

Some students describe experiences during meditation of the pure, settled state of Transcendental Consciousness starting to coexist with the activity of thinking. This is a sign of growth toward Cosmic Consciousness, one of the higher states of consciousness in Maharishi Vedic Science, in which inner silence spontaneously coexists with activity, including the activity of thinking.

When this [transcending] happens I have the sensation that I have arrived at some sort of internal space without having moved. I usually realize that I am there after I have been in this experience for several minutes. At first this realization would cause me to come out of the timeless state but now I remain there for as long as I want to.

In program my experience is one of almost feeling my thoughts settle through subtler levels until they cease and then start again—but accompanying them is the peaceful silence that was singular when they ceased. The only way to describe the experience is unboundedness. I often have thoughts with the experience but nevertheless I have unboundedness in all directions. Sometimes it's not unboundedness but there is almost always expanded awareness. It's every session for most of the session or all of the session when I'm rested. If I'm really tired it may only be once a day and some of the session.

Experiences during the TM-Sidhi program

Although the Experience Questionnaire does not ask students to describe experiences in the TM-Sidhi program, some students identified experiences as occurring during practice of the TM-Sidhi program, including the technique of Yogic Flying (introduced in the chapters by Chandler and Kleinschnitz in this volume). (The word *Dome* refers to the purpose-built dome-shaped buildings on the University campus.)

On one occasion during my Sidhis program I felt physically light and buoyant, as if floating through air. My mind was deeply submerged in a soothing, peaceful “jello”-like substance. I felt energized and very happy afterwards.

During my Yogic Flying program at the Dome I felt like bubbles of bliss raising from my lower stomach up to my head, my body felt warm and the level of joy and harmony was extremely high. Then the feeling became stronger like it was so strong that it was coming out throughout my body. It felt great.

It is hard to say if my experience directly corresponds to the above “peaceful state” but I do feel moments of complete rest, as if I finally let go of my mind and just relax. This mostly occurs during Yogic Flying and is coupled with a feeling of delight that shoots up from my body into my head—threads of happiness that explode in my mind.

“Yogasthah kuru karmāni: Established in Yoga, perform action.”
(Bhagavad-Gītā 2:48)

In the following quotes, students express the extent to which inner restfulness—the experience of Yoga, or Being—prepares them for dynamic activity, bringing out the practical value of the experience for daily life.

During these times I feel like I’m physically here but I’m not. Nothing matters, e.g. time, space, it’s beautiful. I feel very satisfied, and happy afterwards, and also well rested and ready to do some activity.

I seem to have this experience most often right after a long weekend, after I’m fully rested. It is as if I’m not where I was sitting 5 minutes ago anymore, but entered a realm consisting of full bliss and peace. Afterwards I feel extremely replenished, and ready for action.

During my experience in meditation my most common feeling is silence. I feel at ease within my physical being. I always seem to lose track of time, and for me, it isn’t just what happens to me physically, mentally, etc. during meditation, but the after-meditation effects. I feel happy, full of energy, and nonetheless very rested. The inner fulfillment is the greatest though, the feeling of a higher self.

Growth of Cosmic Consciousness: Experiences during activity

Growth of Cosmic Consciousness—the first of the higher states delineated in Maharishi Vedic Science—is characterized by natural infusion of pure awareness, or Transcendental Consciousness, into waking, dreaming, and sleep states of consciousness. This takes place as a result of the deep rest and release of stress during practice of the Transcendental Meditation technique, which refines the physiology and cultures the nervous system to maintain a settled state of awareness even during dynamic activity (see chapter by Chandler in this volume; also Alexander, Boyer, & Alexander, 1987; Alexander, Davies, Dixon, Dillbeck, Druker, et al., 1990). This growth is natural and innocent, rather than being based on attempting to create an attitude of being quiet inside or trying to cultivate and watch for the experience.

The second question on the Experience Questionnaire relates to maintaining pure awareness during activity, often referred to as witnessing activity.

Have you experienced while performing activity that there was an even state of silence within you, underlying and coexisting with activity, yet untouched by activity? This could be experienced as detached witnessing even while acting with intense focus.

Students referred to a wide range of situations and activities in which they have noticed silence coexisting with activity, including the most dynamic activities—swimming, kayaking, playing soccer, riding a bicycle—and also while teaching a class, giving a presentation, talking to friends. Eleven students out of the 126 rated themselves as never having had this experience. The impression gained from these descriptions is of lively young people going about daily activities in a natural way. Some of the experiences are clearer or more clearly expressed than others; growth of experience is abstract, and intellectual understanding may vary.

Experiences during physical activity

When I go for a run by the reservoir, even though my body is moving and under a lot of physical activity, my mind is in some state of peace and silence, almost like transcending.

It's happened to me exercising and dancing. I feel a really strong connection between myself, the activity I'm performing and the environment where it's taking place. Yet, it's not really me performing, I feel more like a witness but still that sense of bliss is there. I still enjoy it deeply.

The following two descriptions emphasize calm, focused relaxation during activity, or spontaneous efficiency of action (a characteristic of growing Cosmic Consciousness). The emphasis on increased enjoyment and effectiveness, and the sense of full attention on activity, are further indications of naturalness of experience.

One good example of this is when I'm playing soccer. Sometimes I move faster than my opponent yet in my mind it was a very slow move. That is, I feel relaxed in the moves that I make, I'm less anxious when a defender defends me, I can see more angles and pass the ball with more accuracy. At times I can even read an opponent's move right before it happens.

This is an experience that has been growing and fluctuating in my awareness. Sometimes it goes away for awhile, but it always comes back. It can be continuous for long periods of time, but sometimes it is still overshadowed. One of the most dynamic examples of this experience was the first time I recognized it. I was kayaking through a very challenging rapid and my awareness was fully focused, my body was moving, I had no thoughts. Then my boat turned slightly and I snapped out of this intense, clear focus, only to snap back into it when I had corrected the angle. My mind felt clear and sharp and I knew exactly what to do without thinking. I was one of the few people who made it down that rapid without flipping over that day.

Inner silence as a normal, natural experience

As with experiences of transcending, several students commented on the naturalness of growth of inner silence during activity:

A natural and unnoticed state of universality.

Not overwhelming or exciting, it's quiet and easy.

This is the natural product of the state of Being I just described. Even in activity my mental state remains refined. Being becomes infused in

daily activity. I don't get tired with activity or feel rough inwardly—I find myself laughing all the time.

Early experiences of growth of consciousness during activity could be faint or indistinct. In the following two examples students express some uncertainty, along with a descriptive comment. The first student marked 0, meaning *Never to my knowledge* for frequency of this experience, but nevertheless wrote a beautiful description.

I feel, however, that such a state is present, which I'm usually only very dimly aware of consciously, but I feel that at a deep level I am less bound by activity now than I used to be. Part of me inside has woken up.

Especially since I've been here for a couple of years—I notice an underlying silence almost all of the time. I have more of an inner calm all of the time. Once in awhile I think I have an experience of witnessing but not too often. When I do, it's like I'm watching a movie and everything is just happening all by itself. I'm talking, but I don't have to think of what I'm saying—it just comes out. But, I always, or almost always, have an even state of silence within me.

Another student explained that experience of silence during meditation begins to carry over into activity, with activity enhancing this experience:

Some days after a particularly clear meditation I feel that inner silence and total contentment last even after I have come out of meditation. Whatever I am doing adds more bliss and fulfillment to this contentment.

Some students interpreted this question in light of benefits experienced during activity from their practice of the Transcendental Meditation technique:

The experience is a feeling of solidity, self-assuredness and stability—no matter what you are dealing w/ physically, emotionally, or mentally I know that I am still me, and I am right here, right now.

I feel relaxed and peaceful. I used to get upset easily but it has changed. I take things as they come and deal with them then.

“Yogah karmasu kaushalam: Yoga is skill in action.”**(Bhagavad-Gītā, 2:50)**

Several students describe experience of a spontaneous quality of skillful, effortless action that is characteristic of growth of consciousness.

I usually feel most silence at the beginning of program & after program. But sometimes during the day I will recognize that I feel calm, settled, clear, & happy or content during an activity. When this happens, I feel content in my activity or with what I'm doing. I also feel as though time doesn't exist & that I will complete the task easily & effortlessly. But at the same time, I'm aware of time & the challenge of the task. When this happens, I'm just satisfied with what is going on. No expectations, anxiety, or worry about tomorrow, next month, or next year is present in my mind or body. It's a very good feeling. A feeling of control, power, & direction. Yet a feeling of innocence, kindness, & thoughtfulness coincides. I feel many & one together.

Another student reports a quality of effortless action that brought delight and accomplishment:

During student teaching, I was in front of the class teaching a lesson. I had felt my body just carry on like something else was in control. My mind felt silent as well as the environment around me but my mouth was still moving, teaching the lesson. I felt very happy inside, almost like my heart was laughing. When I realized that I was in this state, I snapped out and continued. After, when I was able to reflect on my lesson, I saw how smoothly and absolutely wonderfully it went, exceeding not only my expectations, but that of my cooperating teacher too!

Another student experienced an effortless flow of expression, with a sense of spontaneous right action, when giving presentations to class:

It happens every time. So well to the point that I need not prepare more than an outline. It's like something inside of me picks the perfect facts, correlations, expressions, words, timing and perspectives as I go up with total blankness in my head. When it is over, I am generally shocked by what I spoke (with authority) and need to go take notes from what is left newly fresh in my mind. It is very blissful—like handing over the controls. I usually get very high marks for my presentations.

Finally, a student gives a rich description of expanded awareness during settled activities, including reading Vedic literature in Sanskrit (see chapters by Kleinschultz and Oates in this volume; also Sands, 1997). This student also describes clearly a process of adjustment to growth of inner experience:

I have this experience similar to that during TM, which occurs when I'm settled—often during class, reading Sanskrit, during [Yoga] asanas, or even just having a conversation. It comes as a realization that some part of me is separate from what is going on, and then that part comes to the front of my attention and activity is secondary. It just feels like my awareness is expanded—I am very calm and fully aware of all my surroundings, but more of my awareness is beyond them. It is like looking through a wide-angle lens—my mind just opens outwards. At first it felt like I was spacy, but now I am more comfortable with it and it is very enjoyable. I feel so clear and focused, yet totally relaxed—my whole mind is open and as I try to find an end to my mind, the edges of my awareness get tickled and little waves of bliss bubble up, like I'm enjoying a private joke.

Glimpses of Unity

The following descriptions appear to express glimpses of growth toward Unity Consciousness, the highest state of consciousness described in Maharishi Vedic Science, in which inner experience of silent unity begins to permeate outer perception of the environment.

I have a strong sense of inner stability throughout my day. I see life taking place, and I see my involvement in it, but at the same time I also feel like a bystander witnessing a scene. In addition I feel a strong connection with everything around me, as if there were no boundaries separating the two. Very rarely I will notice surface differences between myself and my environment, and realize and appreciate that connection which is usually there.

I feel inner quietness and pleasantness—bliss during most of my waking time. There is a certain stability and good feeling in the background all the time independent of emotions and things happening in life. I can hear the silence, but also feel silence, I'd say even see the silence. It feels like I really exist and everything exists. Everything takes place in

a way that it's supposed to. There's always possibility to make decisions, but it feels like everything happens the best possible way. The feeling is continuous—calm, happy, undisturbed.

Growth of Cosmic Consciousness: Pure consciousness during sleep

The third question on the Experience Questionnaire also relates to growth of Cosmic Consciousness, in this case, spontaneously maintaining pure awareness during sleep, also called witnessing sleep. The question is worded as follows:

During sleep, have you ever experienced a quiet, peaceful, inner wakefulness? You awake fresh and rested, but with the sense that you had maintained a continuity of silent self-awareness during sleep.

The following descriptions are drawn from approximately 90 students who reported varying degrees of frequency of witnessing sleep and also wrote a meaningful description of the experience. Of the other students, 20 reported that they had never had this experience (compared with 11 for witnessing activity, and five for transcending); another 15 indicated some experience but didn't write any description or their description was fragmentary or illegible. Some of the experiences below may not satisfy the precise criteria for witnessing sleep. However, it is natural in the early days of this experience that there may be some variability in experience, and in the way it is expressed in words; understanding of the experience may itself be vague.

This type of experience usually doesn't last a whole night's sleep but just parts of it. I'll feel awake & aware of my surroundings while reaping the benefits of the deepest sleep.

This always feels like the simplest of experiences. I am completely relaxed, but know that I am sleeping. When I wake up I am immediately aware of it having happened. I almost feel that I didn't sleep, but was awake, except I know I was sleeping. I always feel extremely happy and peaceful after such an experience. I am unaware of time, but it always feels short, no matter how long it lasted.

I feel an evenness in consciousness from waking through sleep and dreaming. I may not always remember the dead of sleep, but I can feel

through it, and have no sensation of becoming conscious when I am suddenly woken, i.e. I feel I was already conscious.

Feeling rested and fresh after witnessing sleep

Waking up feeling rested and refreshed is an indication that experience of inner wakefulness during sleep is not being confused with insomnia or lightness of sleep. The students who wrote the following quotes refer to how they felt on waking.

Yes I do get deep rest and inner awareness. Most of the time I wake up feeling rested.

When I woke up, it felt like coming back from somewhere where I was nourished with peace and silence, it was a fulfilling energy. I felt so integrated with everything else. I felt extremely awake in the level of silence.

Most recently, when I was staying in a Sthapatya Vedic [Vedic-architecture designed] house—I did not seem to go into dead sleep, or even heavy R.E.M. dreaming, as is usual with me. Instead, I mainly felt a fresh liveliness in my mind and woke up early the next morning, fully rested. My body felt light, as if floating in space when walking or lying down.

Some students report feeling they were actually awake during the night, then realizing it was an experience of witnessing sleep. Intellectual understanding of the possibility of naturally maintaining wakeful awareness during sleep can be helpful in these circumstances.

I don't experience this often, but sometimes during sleep, I feel as if I am awake, but then I wake up feeling refreshed, and realize that I was sleeping.

I feel like I didn't sleep all night and still feel well rested when I get up and during the day. This happens often.

Many students express that the experience of some value of witnessing is vague or faint, or they are unsure if they have had it at all. This is a natural part of growth of abstract inner experience. Intellectual understanding helps clarify experience.

It's hard to say how often this happens—on a subtle level it's there a lot, on a more expressed level more rare. When I settle down I just have a feeling of complete comfort & happiness, it lasts until I wake up & then the happiness changes to be more lively.

I vaguely remember times when I felt like I didn't sleep most of the night, yet I was asleep because I eventually woke up. There was definitely an awareness there.

It is difficult for me to say how often I have this experience: often I wake up when I thought I was already awake, but experiences of clear, quiet inner wakefulness are more rare. When I have these experiences, I am quietly aware, without exactly being aware that I am aware.

I've had that experience but it's been very faint. But the reason I mention it is because for awhile I had this experience quite often. But every time was very faint, and still I could say I had it.

As with transcending, some students express that the experience is hard to put into words—or that they are reluctant to analyze it.

Experience has progressed to a point that is no longer easy to form into words—I would say simultaneity & wholeness might best capture it. Isness is a word that comes to mind. This is not something I analyze, so I'm not able to easily explain.

This does happen to me sometimes, though after it is over, the experience melts into a faint state of memory. It is the joy of inner peace that remains, which to me is more important than analyzing the process that gave me this calm.

Clarity of experience furthered by deep rest

As with the experience of transcending, a number of students observed that going to bed early enhances their experience of witnessing sleep:

As long as I have been getting enough rest in my life, I can experience myself as being wakeful during sleep time & then wake up feeling rested.

This most often occurs when I am on a great routine & have been going to bed by 10:00 or before for about 3 weeks. When this happens I am

asleep, but I am pretty alert & know that I am alert while I'm sleeping. When I wake up I feel incredible—fresh & extremely rested & awake.

This is a very subtle thing for me, but when I am rested, I enjoy sleep. It is so refreshing. I have been having this blissful quality in my sleep for awhile, but it was only after it went away that I recognized it. I was out of town for a few days and suddenly my sleep was dull, boring, and not rejuvenating. I woke up frustrated and tired. My sleep was so heavy when I was away from Fairfield and off the routine. Here, my sleep is light, clear, restful, enjoyable. Sometimes, when I have been up late it becomes dull again, but this is my main experience.

When I'm rested I awake refreshed and there is a feeling when I wake that there's been almost no break in my wakefulness. It's almost like that unboundedness or expanded awareness in TM that is maintained in activity but now it's somewhat there at night. I don't think I'm actually aware at night but when I awake I feel a sense of continuity that there is some wakefulness or expandedness that was there during my dreaming. When I'm rested this experience is almost every day.

This experience is very much influenced by my activities throughout the day. Also, the time I got to bed, and the hours I sleep. I also realized that this experience is enhanced when I sleep at a place (either home or other location) where I am surrounded by my loved ones, like my parents' home. My outer peacefulness can very well reflect my inner peace.

Finally, several students described experiences of unboundedness while falling asleep:

I experience the different stages of going to sleep. My mind going deeper—more silent—in a way going beyond my body—I feel beyond my body—expanded silent—my thoughts are like someone is speaking—I am watching myself go to sleep—I am expanded—my body is a thing lying there—breathing—I am the observer.

Usually (probably always) in the process of falling asleep, so I don't know if I was completely asleep. But my awareness is clear and settled, and my mind's normal clutter of activity is quieted or ignored. Sometimes I am more aware of my physiology in a thoughtless sort of way. Everything seems very still and peaceful (inside).

Usually this happens if I fall asleep in meditation and I maintain a little thread of awareness along with the conscious processing that my body is sleeping. Way cool!

All these descriptions taken together capture the essence of natural, blissful experience of growing consciousness: young students at a contemporary university in the West confirming the reality of ancient descriptions of higher states of consciousness from the timeless Vedic tradition of knowledge. One can only desire that greater numbers of young people be offered the chance to have this quality of experience and growth as part of their education, so they can come to agree with the last student quoted above: that growth of higher states of consciousness is “Way cool.” The happiness, wisdom, and expanded thinking and decision making that such young people can bring to the world makes real the possibility of a new generation of wise leaders.

Conclusion

Development of higher states of consciousness is vital to establish world peace, because it is the narrowness of vision and inability to accomplish one's desires that cause uncertainties, fears, and loss of self-confidence, leading to frustration and all unwanted values in life, which make life cry for peace (Maharishi, In *Maharishi's Programme to Create World Peace*, 1986, p. 7).

The experiences reported here add to the growing body of research on the technologies of Maharishi Vedic Science which brings into the realm of objective verification the qualities of inner development, or spirituality, previously considered to be beyond the realm of science. Applying this knowledge in education to awaken the full potential of the student fulfills the desire of educators for a unifying foundation of experience and understanding.

Maslow (1976) observed that those at the highest levels of development are more capable of contributing to the moral, aesthetic, intellectual, and social progress of human civilization. Even more so, those experiencing higher states of consciousness are the most precious resource of society. In our rush to keep up with diversifying fields of information and technology, educators cannot afford to ignore development of this precious inner resource: the full potential of consciousness.

As “spiritual development is the basis of all other forms of development” (Maharishi, 1967, p. 255), it is vital that the quality of experience brought to light in this article be made widely available to students everywhere.

References

- Alexander, C. N., Boyer, R., & Alexander, V. (1987). Higher states of consciousness in the Vedic Psychology of Maharishi Mahesh Yogi: A theoretical introduction and research review. *Modern Science and Vedic Science*, 1(1).
- Alexander, C. N., Davies, J. L., Dixon, C. A., Dillbeck, M. C., Druker, S. M., Oetzel, R. M., et al. (1990). Growth of higher stages of consciousness: Maharishi's Vedic Psychology of human development. In C. N. Alexander & E. J. Langer (Eds.) (1990). *Higher stages of human development: Perspectives on adult growth* (pp. 286–341). New York: Oxford University Press.
- Alexander, C. N., Rainforth, M. V., & Gelderloos, P. (1991). Transcendental Meditation, self-actualization, and psychological health: A conceptual overview and statistical meta-analysis. *Journal of Social Behavior and Personality*, 6(5), 189–247.
- Astin, A. W. (1991). *Assessment for excellence: The philosophy and practice of assessment and evaluation in higher education*. New York: McMillan.
- Boyer, E. L. (1987). *College: The undergraduate experience in America*. The Carnegie Foundation for the Advancement of Teaching. New York: Harper and Row.
- Brown, S. M. (2008). *Unity and diversity in Maharishi Vedic Science, higher states of consciousness, and a study of undergraduate student development*. (UMI No. 3318934).
- Chandler, H. M. (1990). Transcendental Meditation and awakening wisdom: A 10-year longitudinal study of self-development. *Paper Abstracts International*, 51 (10B), 5048. (UMI No. 9107332).
- Chandler, H. M., Alexander, C. N., & Heaton, D. (2005). The *Transcendental Meditation* program and postconventional self development: A 10-year longitudinal study. *Journal of Social Behavior and Personality*, 17(1), 93–121.

- Chickering, A. (Ed.) (1981). *The modern American college: Responding to the new realities of diverse students and a changing society*. San Francisco: Jossey-Bass.
- Cohn, L. D. (1998). Age trends in personality development: A quantitative review. In P. M. Westenberg, A. Blasi, & L.D. Cohn (Eds.), *Personality development: Theoretical, empirical and clinical investigations of Loevinger's conception of ego development* (pp. 133–143). Mahwah, NJ: Lawrence Erlbaum Associates.
- Cook-Greuter, S. R. (1999/2000). *Postautonomous ego development: A study of its nature and measurement*. Doctoral paper. Cambridge, MA: Harvard University Graduate School of Education.
- Cook-Greuter, S. R. (2000). Mature ego development: A gateway to transcendence? *Journal of Adult Development*, 7(4), 227–240.
- Epstein, S. (2001). *Constructive Thinking Inventory: Professional manual*. Lutz, FL: Psychological Assessment Resources, Inc.
- Loevinger, J. (1976). *Ego development: Conceptions and theories*. San Francisco, CA: Jossey-Bass.
- Loevinger, J., Cohn, L. D., Bonneville, L. P., Redmore, C. D., Streich, D. D., & Sargent, M. (1985). Ego development in college. *Journal of Personality and Social Psychology*, 48(4), 947–962.
- Loevinger, J., & Wessler, R. (1970). *Measuring ego development 1*. San Francisco, CA: Jossey-Bass.
- Maharishi Mahesh Yogi (1967). *Maharishi Mahesh Yogi on the Bhagavad-Gita: A new translation and commentary (Chapters 1–6)*. London, UK: Penguin.
- Maharishi Mahesh Yogi (1997). *Celebrating perfection in education*. Holland: MVU Press.
- Maharishi's program to create world peace. (1986) [Pamphlet]. USA: Age of Enlightenment Press.
- Maslow, A. H. (1976). *The farther reaches of human nature*. New York: Penguin Books.
- Mentkowski, M., Rogers, G., Deemer, D., Ben-Ur, T., Reisetter, J., Rickards, et al. (1991). *Understanding abilities, learning and development through college outcomes studies: what can we expect from higher education assessment?* Presented at the Annual Meeting of the American Educational Research Association, Chicago, April 5, 1991.

- Nader, T. (1994). *Human physiology: Expression of Veda and the Vedic Literature*. (4th ed.). Holland: MVU Press.
- Neville, B. (1989). *Educating Psyche: Emotion, imagination, and the unconscious in learning*. Melbourne, Australia: Collins Dove.
- Sands, W. F. (1997). Maharishi's program of reading the Vedic literature: Unfolding the total potential of natural law. *Modern Science and Vedic Science*, 7(1), 92–105.
- Shearer, A. (Trans). (1989). *The Yoga Sūtras of Patanjali*. Delhi, India: Motilal Barnarsidass.
- Summary of Research on Consciousness-Based Education*. [Brochure] (2001). Fairfield, IA: M.U.M. Press.

This article, “Experiences of Growth of Consciousness in Undergraduate Students at Maharishi University of Management,” by Sue Brown, Ph.D., here revised/updated, and reprinted with permission, was accepted as part of her dissertation for a Ph.D. in Maharishi Vedic Science at Maharishi University of Management.

Section IV



Higher States of Consciousness: Objective Research

**Pure Consciousness: Distinct Phenomenological
and Physiological Correlates
of “Consciousness Itself”**

■

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ABSTRACT

This paper explores subjective reports and physiological correlates of the experience of "consciousness itself"—self-awareness isolated from the processes and objects of experience during the practice of the Transcendental Meditation technique. Subjectively, this state is characterized by the absence of the very framework (time, space, and body sense) and content (qualities of inner and outer perception) that defines waking experiences. Physiologically, this state is distinguished by the presence of apneustic breathing, autonomic orienting at the onset of breath changes, and increases in the frequency of peak EEG power. A model, called the junction point model, is presented that integrates pure consciousness with waking, dreaming, or sleeping. It could provide a structure to generate a coherent program of research to test the full range of consciousness and so enable us to understand what it means to be fully human.

Introduction

[O]ur normal waking consciousness, rational consciousness as we call it, is but one special type of consciousness, whilst all about it, parted from it by the filmiest of screens, there lie potential forms of consciousness entirely different. We may go through life without suspecting their existence No account of the universe in its totality can be final that leaves these other forms of consciousness quite disregarded. (James, 1902/1961, p. 305)

What is the nature of consciousness? This question was central to William James's thinking 100 years ago, and is still central to research today. Natsoulas (1997a, 1997b) explored the phenomenon of consciousness by analyzing the role of self-awareness in the six definitions of consciousness found in the *Oxford English Dictionary*. The first five definitions of consciousness seemed to fall under James's category of normal waking consciousness or rational consciousness: (1) interpersonal cognitive relations, (2) remembering on a firsthand basis one's past actions or experiences, (3) occurrent awareness of any object; (4) immediate awareness of one's mental-occurrence instances, and (5) the totality of mental-occurrence instances that constitute our conscious being. The sixth definition could be an instance of James's "potential forms of consciousness entirely different." Nat-

soulas defines this last kind of consciousness as the general mode of mental functioning that is distinct from the specific mental-occurrence instances, which make up the stream of consciousness (1997b, p. 90).

Natsoulas (1997b, p. 90) cites the need to understand this sixth kind of consciousness to fully comprehend the mind's typical modes of functioning. William James (1902/1961) likewise, as expressed in the previous quote, emphasizes the need to understand other forms of consciousness to fully understand the "universe in its totality."

A number of authors have defined states that could fall into this sixth category of consciousness. Natsoulas (1997b, p. 90) posits that the stream of consciousness flows on through this level of consciousness. O'Shaughnessy (1986, p. 49) suggests that consciousness itself is "...distinct from particular consciousnesses or awareness." He proposes that this level of consciousness may be like an "empty canvas" that cannot be viewed representationally, but makes possible and is physically necessary to view a painted picture (O'Shaughnessy, 1986, p. 50). Woodruff-Smith (1986, p. 150) defines a level of consciousness that is "the inner awareness that makes an experience conscious . . . a constituent and constitutive feature of the experience itself." Baar's theater metaphor includes an attention director or deep self whose function seems similar to these descriptions, namely providing a context (framework) to connect one conscious event with another (1997, p. 126).

The prevailing Western view is that an individual cannot be conscious without particular mental-instances in consciousness (Natsoulas, 1997b); and that no subjective state can be its own object of experience (James, 1890/1951, p. 190). In contrast, the subjective traditions of the East—the Vedic tradition of India (Maharishi, 1969), and the Buddhist traditions of China (Chung-Yuan, 1969) and Japan (Reps, 1955)—include systematic meditation techniques predicted to lead to the state of "consciousness itself" without particular consciousnesses. For instance, the Maitri Upanishad (Maitri Upanishad 6:19, in Upanishads, 1953) states:

When a wise man has withdrawn his mind from all things without, and when his spirit of life has peacefully left inner sensations, let him rest in peace, free from the movements of will and desire. . . . Let the spirit of life surrender itself into what is called *turya*, the fourth condition of consciousness. For it has been said: There is something beyond

our mind which abides in silence within our mind. It is the supreme mystery beyond thought. Let one's mind . . . rest upon that and not rest on anything else.

Maharishi Mahesh Yogi (1986), responsible for bringing the Transcendental Meditation technique to the West from the Vedic tradition of India, explains:

When consciousness is flowing out into the field of thoughts and activity it identifies itself with many things, and this is how experience takes place. Consciousness coming back onto itself gains an integrated state . . . This is pure consciousness. (pp. 25)

Pure consciousness is "pure" in the sense that it is free from the processes and contents of knowing. It is a state of "consciousness" in that the knower is conscious through the experience, and can, afterwards, describe it. The "content" of pure consciousness is self-awareness. In contrast, the contents of normal waking experiences are outer objects or inner thoughts and feelings.

Pure consciousness is a direct experience of the natural structure of human experience during the practice of the Transcendental Meditation technique. Examining this direct experience of pure consciousness could deepen our understanding of the phenomenon of consciousness.

This study explored the phenomenological and physiological correlates of pure consciousness during meditation practice. In light of these subjective and objective markers, a model is presented that integrates pure consciousness with normal waking experience.

Phenomenological Analysis of Pure Consciousness Experiences

Method

Subjects

Fifty-two University students, twenty-six males and twenty-six females, were asked to participate in the study. They were an average age of 22.5 years (SD 6.9). They had been practicing the Transcenden-

tal Meditation technique for an average of 5.4 years (SD 5.0). These subjects were measured because there are a large number of individuals practicing the Transcendental Meditation technique (over 1,500) living within an hour of the University. They range in age from 10 years to over 80 years of age and have practice the Transcendental Meditation technique from a few months to over three decades. Focusing research on one group controls for different meditation experiences, and allows well-defined research into the nature of inner experiences. In addition, there are many studies that have differentiated the experience of “consciousness itself” from other experiences during Transcendental Meditation practice and during ordinary waking consciousness (see Travis and Wallace, 1997), so that we can probe into the character of this state of “consciousness itself.” This study does not attempt to compare the frequency of this experience across subject populations. It focuses on Transcendental Meditation subjects as an example of how this meditation technique may provide access to the inner structure of subjective experience.

Procedure

The subjects were tested in a group. They were asked: “Please describe the fine details of your deepest experiences during practice of the Transcendental Meditation technique. Please describe them in your own words, just as if you were describing the experience of eating a strawberry—its sweetness, juiciness, etc.” We emphasized that we were interested in what *they* experienced, in how it felt to *them*, and that we were not interested in other people’s descriptions of these experiences. (We did not ask for descriptions of pure consciousness. That would have elicited biased responses reflecting more what they knew about pure consciousness, rather than their direct experience of this state.) They were allowed to write as much and for as long as they wished.

Data Analyses

The descriptions were analyzed using the guidelines for systematizing phenomenological analysis proposed by Hycner (1985). This procedure begins with reading the passage (all 52 descriptions) many times to get “a sense of the whole.” Next, Hycner recommends reading through and bracketing out “units of meaning”—words or phrases which express a

unique and coherent idea. Once the units of meaning were identified, then, as Hycner recommends, units that were clearly redundant were eliminated. Next, the units were clustered by “shared meanings.” This was done by explicit and implicit meaning. From these clusters of shared meaning, general themes were identified. The final step was to reread the descriptions and tally the occurrence of the themes. This yielded the number of subjects who included that theme in their descriptions, expressed as a percentage of total subjects.

Results

Three major themes emerged from this analysis. Table 1 presents these three themes (left column), and the percent of subjects who used each theme to describe their experiences (right column). As seen in this table, 68% of the subjects explicitly characterized deep experiences during practice of the Transcendental Meditation technique by the absence of space, time, or body sense. The other two themes—peaceful and unboundedness—implicitly include the lack of boundaries of space, time and body sense, but further describe the experience when these boundaries were absent. For instance, one subject described the experience of pure consciousness as:

[A] couple of times per week I experience deep, unbounded silence, during which I am completely aware and awake, but no thoughts are present. There is no awareness of where I am, or the passage of time. I feel completely whole and at peace.

<i>Major themes in the descriptions</i>	<i>Percentage</i>
Absence of Space, Time, or Body Sense	68%
Peaceful	32%
Unbounded	20%

Table 1. Results of the content analysis: The major themes and the percent of subjects using those themes to describe pure consciousness experiences

Chi square goodness of fit was used to test the null hypothesis—that these three themes were randomly selected by the subjects, and did not represent specific dimensions of their experience of pure consciousness. For this analysis, the expected occurrence of each theme was 33%—equal probability of the three dimensions. The chi square was highly significant ($X^2 = 48.2$, $p < .001$), suggesting that the pattern of responses in the content analysis was not due to chance.

Discussion

The content analysis of deep experiences during practice of the Transcendental Meditation technique suggests that pure consciousness, “consciousness itself,” is distinct from normal waking experiences. “Time, space, and body sense” are the framework for understanding waking experience. Specific qualities (color, shape, size, movement, etc.) are the content of waking experiences. During pure consciousness experiences, both the fundamental framework and the content of waking experience were reported to be absent. This suggests that pure consciousness may not be an “altered” state of waking. It is not described as a distorted waking experience. Rather, pure consciousness is described by the absence of the customary qualities and characteristics of waking experience. The subjective descriptions of pure consciousness portray a state of *self-awareness* (the subjects are awake during this state and they can describe the nature of the experience afterwards) *without waking processing and contents*. Pure consciousness appears to be self-awareness isolated from the processes and objects of experience.

If pure consciousness is an aspect of normal human consciousness, then it should have been reported across cultures and throughout time, even in the absence of systematic meditation techniques. We explored this possibility by examining historic records.

In the so-called Hermetic Writings (1924, Vol. 1, p. 191), set down by various Egyptian authors in the second and third centuries A.D., we find descriptions of experiences of what is termed ‘the Good’:

Then only will you see it [the Good], when you cannot speak of it; for the knowledge of it is deep silence, and suppression of all the senses. He who has apprehended the beauty of the Good can apprehend nothing else; he who has seen it can see nothing else; he cannot hear speech

about aught else; he cannot move his body at all; he forgets all bodily sensations and all bodily movements, and is still. [*Hermetica, Libellus X*]

The experience of the Good, according to this author, is unlike ordinary waking state experience. One experiences the Good in "deep silence," when the mind transcends ordinary sensory perception and body sense and 'is still.'

Louis Blossius (1925, p. 123), the sixteenth century French Benedictine monk, described at length and with insight experiences suggestive of pure consciousness experiences.

At last, when its higher powers have been raised up, enlightened and adorned by divine grace, the spirit will attain to a simple unity, and will arrive at pure love without images in the imagination, and at a simple knowledge of the mind without reflections. . . . The simple eye of the soul itself remains open. . . . This eye is a pure, simple, uniform *thought*, raised above all *reflections* of the intellect. . . . The soul sees nothing in time, but raised above time and place, takes to itself, as it were, a characteristic of eternity. . . . It loses itself in the infinite solitude . . but so to lose itself is rather to find itself.

Blossius describes a state in which the mind reaches a "simple unity," without "images" or "reflections," beyond time and space. "The simple eye of the soul itself remains open . . . above all reflections of the intellect.'

Hakuin Zenji (1963, p. 117–118), the Japanese Zen Buddhist saint, emphasizes that this experience takes place when mental activity settles and the mind becomes peaceful—and this experience, furthermore, is quite distinct from "everyday consciousness":

Before long you will find that the mind-nature has become settled in you—like a great rock, immovable and peaceful. . . . But do not then leave off. . . . Then what one often hears about will take place. . . . All your usual, everyday consciousness will cease . . . [Then] the one, pure, unconfused truth, all, as it were, in one whole, will rise up before your very eyes. . . .

Perhaps the classic description of this state in the West is found in William Wordsworth's (1979, p. 156) "Lines Composed a Few Miles Above Tintern Abbey."

... that blessed mood,
 In which the burthen of the mystery,
 In which the heavy and the weary weight
 Of all this unintelligible world,
 Is lightened:—that serene and blessed mood,
 In which the affections gently lead us on—
 Until, the breath of this corporeal frame
 And even the motion of our human blood
 Almost suspended, we are laid asleep
 In body, and become a living soul;
 While with an eye made quiet by the power
 Of harmony, and the deep power of joy,
 We see into the life of things.

Wordsworth's description is notable for its exactness. He feels calm, "serene." During this state, Wordsworth feels he has "become a living soul," able to "see into the life of things." Clearly this was more than just a moment of relaxation—it is a qualitatively unique state.

Many more examples could be cited, all with the same distinctive features. Of course we cannot know precisely what these authors were experiencing. These descriptions do, however, reflect the major themes seen in the content analysis of Transcendental Meditation experiences, namely a state beyond space, time, and body sense, characterized as unbounded and peaceful. These reports suggest that pure consciousness is a naturally occurring state not tied to a specific culture or world view.

To have any experience, the nervous system functions in a specific manner. For instance, cognitive processing (Posner and Raichle, 1994) and states of consciousness (Rechtschaffen and Kales, 1968) are delineated by activity in different areas of the brain and nervous system. Likewise, the experience of pure consciousness should be characterized by a specific pattern of physiological functioning. Empirical markers of this state would afford an objective gauge to compare pure consciousness (consciousness itself) to waking experiences.

Physiological Correlates of Pure Consciousness Experiences

Changes in EEG, breath rate, skin conductance, and heart rate have been used as physiological "windows" to understand the state of pure consciousness. Refined breathing was the first published marker of this experience. Farrow and Hebert (1982) and later Badawi and colleagues (1984) observed suspension of normal respiration from 10 to 40 secs during pure consciousness experiences. This type of breathing, while initially termed "respiratory suspension," is actually an example of apneustic breathing—slow, prolonged inspiration (Kesterson and Clinch, 1989). Apneustic breathing is supported by different respiratory drive centers in the brain stem (Plum and Posner, 1980, Travis and Wallace, 1997) than those that drive breathing during waking.

A second reliable marker of this state is skin conductance responses at the onset of breath changes (Travis and Wallace, 1997). These autonomic responses are similar to those seen during orienting—attention switching to environmental stimuli that are novel (Sokolov, 1963; O'Gorman, 1979) or significant (Maltzman, 1977; Spinks et al., 1985). They could mark the transition of awareness from active thinking processes to the wakeful mental quiescence of pure consciousness.

Figure 1 on the next page presents an example of apneustic breathing with autonomic orienting at the onset of breath changes. In this figure, breath rate (BR: exhale is down) is the top tracing, electrodermal activity (EDA: increasing skin conductance is down) is the middle one, and heart rate variability (HR: increasing heart rate is up) is the bottom tracing. Note the skin conductance response and the heart response following the onset of the 16-sec long apneustic breathing.

A third marker, which is less obvious but has been reported in most studies, is a trend for increasing frequency of the peak power in the EEG. Compared to the period prior to the respiration suspension, the frequency of peak power of the EEG increases from 0.5 to 1.5 Hz. Fluctuations in frequency of peak power follow fluctuations in alertness. For instance, during sleep 1 Hz EEG is seen, while during very focused tasks 40 Hz EEG activity is reported. The observed increase in frequency of peak power during respiration suspensions could be an indication of increased alertness during this experience.

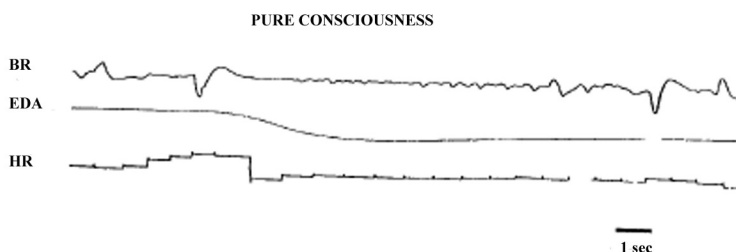


Figure 1. Physiological tracing during pure consciousness. This figure presents an example of apneustic breathing with autonomic orienting at the onset of breath changes. In this figure, breath rate (BR: exhale is down) is the top tracing, electrodermal activity (EDA: increasing skin conductance is down) is the middle one, and heart rate variability (HR: increasing heart rate is up) is the bottom tracing. Note the skin conductance response and the heart response following the onset of the 16-sec long apneustic breathing.

Discussion of Physiological Patterns during Pure Consciousness

Physiologically, pure consciousness is characterized by apneustic breathing, skin conductance orienting at the onset of breath changes, and increase in frequency of the peak power of the EEG. Apneustic breathing is not reported in normal populations (outside of meditation practice), and has never been reported in the literature with durations longer than 4–6 secs. The respiratory drive centers responsible for apneustic breathing (the parabrachialis medialis nuclei) are quiet during waking, dreaming and sleeping, but become active during pure consciousness periods. This change in respiration occurs on the background of changing functioning of the autonomic nervous system. Prior to pure consciousness periods, sympathetic activity is low (low skin conductance levels) and parasympathetic activity is high (high respiratory sinus arrhythmia levels [see Porges, 1995]. Onset of pure consciousness periods was marked by bursts of activity in both the sympathetic and parasympathetic nervous systems (skin conductance and heart rate responses) followed by autonomic quiescence during the period. It is noteworthy that an experience subjectively described as ‘unbounded’ and ‘peaceful’ was objectively marked by the virtual absence of breath and autonomic activity, along with heightened alertness (increased frequency of peak power of the EEG). This unique con-

stellation of physiological patterns is unlike any seen in normal waking, sleeping, or dreaming.

Pure consciousness is experientially and physiologically distinct from experiences during waking, sleeping, and dreaming. However, being a state of consciousness it should be integrated with normal waking consciousness. This paper concludes with a model that attempts to integrate this broader range of consciousness.

An Integrated Model of Consciousness

Current models of consciousness primarily focus on explaining normal waking experiences—the first five kinds of consciousness defined at the beginning of this paper. For example, Baars (1997) developed a “theater metaphor” with a “spotlight of attention,” an “attention director,” “contextual operators,” and the “unconscious audience” of automatic processes. This metaphor elegantly explains normal waking experiences, including perception, selective attention, controlled and automatic processing, priming, volition, and context effects. However, it was not made to explain content-free experiences, or pure consciousness experiences.

What would be the structure of a model that integrated this fundamental level of consciousness with the flow of mental-occurrences that characterize waking? The descriptions of the sixth kind of consciousness presented earlier suggest two possible elements for an integrated model of consciousness: (1) this level of consciousness *underlies* particular awarenesses (Natsoulas, O’Shaughnessy and Woodruff-Smith), and (2) it *functions in the gaps* between experiences, connecting individual perceptions into a continuous stream (Baars).

A model has been proposed, an “ocean metaphor,” which conceptualizes pure consciousness as a fundamental state (an ocean), which sometimes appears as (a wave of) waking consciousness, sometimes as dreaming consciousness, and sometimes as deep sleep consciousness (Maharishi, 1972, 1986b). In this model, pure consciousness underlies the activity of waking, dreaming and sleeping, and can be objectively identified and subjectively experienced at the junction point between each state, i.e., where waking has ceased and sleep has not yet begun (Travis, 1994). According to this model, which Travis (1994) called the “junction point model,” the activities of waking, sleeping, and dream-

ing are the “filmiest screens,” which James spoke of, hiding the silent nature of pure consciousness—the surface waves covering up the silent depths of the ocean of consciousness.

Preliminary data support two unique predictions of this model: (1) pure consciousness is an underlying continuum that can be identified in the junction points between waking, dreaming and sleeping (suggested by similar EEG patterns in the junction points between waking and sleeping, and sleeping and dreaming (Travis, 1994); and (2) pure consciousness can be integrated with waking, dreaming and sleeping (suggested by increased EEG alpha power and coherence during eyes-open rest periods (Travis, 1991), and during deep sleep (Mason et al., 1997) in subjects reporting this integrated experience).

Conclusion

These phenomenological and physiological data suggest that pure consciousness has a completely different status than waking experiences. Waking experiences (the other five definitions of consciousness) include particular instances. Pure consciousness is the ground upon which these particular instances are appreciated and connected. In terms of the junction point model, pure consciousness is the underlying “ocean,” and particular conscious experiences are the changing waves. These waves exist and change through time based on the underlying level of pure consciousness. Further testing of this model and of the nature of pure consciousness, may, as James asserted, provide a basis for fully understanding who we are, and what it means to be fully human.

References

- Baars, B. (1997). *In the theater of consciousness: the workspace of the mind*. New York: Oxford University Press.
- Badawi, K., Wallace, R. K., Orme-Johnson, D., and Rouzeré, A.-M. (1984). Electrophysiological characteristics of respiratory suspension periods occurring during practice of the Transcendental Meditation program. *Psychosomatic Medicine*, 46, 267-76.
- Blosius, L. (1925). *A book of spiritual instruction*. trans. Bertrand A. Wilberforce. London: Burns Oates and Washbourne.
- Chung-Yuan, C. (1969). *Original teachings of Ch'an Buddhism*. New York: Vintage Books.
- Farrow, J.T., and Hebert, J.R. (1982). Breath suspension during the Transcendental Meditation technique. *Psychosomatic Medicine*, 44, 133-53.
- Hermetica*. (1924). Ed. Walter Scott. Oxford, England: Oxford University Press.
- Hycner, R.N. (1985). Some guidelines for the phenomenological analyses of interview data. *Human Studies*, 8, 279-303.
- James, W. (1890/1951). *Principles of psychology*. New York: Dover Books.
- James, W. (1902/1961). *Varieties of religious experiences*. New York: Collier Books.
- Kesterson, J. and Clinch, N. (1989). Metabolic rate, respiratory exchange ratio, and apneas during meditation. *American Physiological Society*, 89, R632-R638.
- Maharishi Mahesh Yogi. (1969). *On the Bhagavad Gita: A New Translation and Commentary, Chapters 1-6*. New York: Penguin Books.
- Maharishi Mahesh Yogi. (1972). *The Science of Creative Intelligence*. Livingston Manor, New York: Age of Enlightenment Press.
- Maharishi Mahesh Yogi. (1986). *Life supported by natural law*. Washington, DC: Age of Enlightenment Press.
- Maltzman, I. (1977). Orienting in classical conditioning and generalization of the galvanic skin response to words: An overview. *Journal of Experimental Psychology: General*, 106, 111-19.
- Mason, L., Alexander, C., Travis, F., Marsh, G., Orme-Johnson, D.W., Gackenback, J., Mason, D.C., Rainforth, M., and Walton, K.G. (1997). Electrophysiological correlates of higher states

- of consciousness during sleep in long-term practitioners of the Transcendental Meditation program. *Sleep*, 20(2): 102–110.
- Natsoulas, T. (1997a). Consciousness and self-awareness—Part I: consciousness, consciousness, consciousness. *Journal of Mind and Behavior*, 18, 53–74.
- O’Gorman, J.G. (1979). The orienting reflex: Novelty or significance detector? *Psychophysiology*, 16, 253–62.
- O’Shaughnessy, B. (1986). Consciousness. *Midwest Studies in Philosophy*, 10, 49–62.
- Plum, F., and Posner, J.B. (1980). *The diagnosis of stupor and coma*. Philadelphia: F.A. Davis.
- Porges, S.W. (1995). Orienting in a defensive world: Mammalian modifications of our evolutionary heritage. A Polyvagal Theory. *Psychophysiology*, 32, 301–318.
- Posner, M. and Raichle, M. (1994). *Images of mind*. New York: W. H. Freeman.
- Rechtschaffen, A. and Kales, A. (Eds.). (1968). *A manual of standardized terminology, techniques, and scoring system for sleep stages of human sleep*. (NIH Publ. No. 203). Washington, D.C.: U.S. Government Printing Office.
- Reps, P. (1955). *Zen flesh, Zen bones*. New York: Doubleday Anchor Book.
- Shear, J. (1990). *The inner dimension: Philosophy and the experience of consciousness*. New York: Peter Lang.
- Sokolov, E.N. (1963). *Perception and the conditioned reflex*. Oxford: Pergamon.
- Spinks, J.A., Blowers, G.H., and Shek, D.T.L. (1985). The Role of the Orienting Response in the Anticipation of Information: A Skin Conductance Response Study. *Psychophysiology*, 22, 385–94.
- Travis F.T. (1991). Eyes open and TM EEG patterns after one and after eight years of TM practice. *Psychophysiology*, 28 (3a):S58.
- Travis, F.T. (1994). The junction point model: A field model of waking, sleeping, and dreaming relating dream witnessing, the waking/sleeping transition, and Transcendental Meditation in terms of a common psychophysiology state. *Dreaming*, 4(2), 91–104.

- Travis, F.T. and Wallace, R.K. (1997). Autonomic patterns during respiratory suspensions: Possible markers of Transcendental Consciousness. *Psychophysiology*, 34, 39–46.
- Upanishads: the Principle Upanishads*. (1953). London: Allen and Unwin.
- Woodruff-Smith, D. (1986). The structure of (self-)consciousness. *Topoi*, 5, 149–156.
- Wordsworth, W. (1979). Lines Composed a Few Miles Above Tintern Abbey, In M.H. Abrams, (Ed.), *The Norton Anthology of English Literature*, fourth edition. New York: W.W. Norton and Company, p. 156.
- Zenji, H. (1963). The embossed tea kettle. [R.D.M. Shaw, trans.] London: George Allen and Unwin.

This article, "Pure Consciousness: Distinct Phenomenological and Physiological Correlates of 'Consciousness Itself,'" by Frederick Travis and Craig Pearson, here revised/updated, and reprinted with permission, was originally published in *International Journal of Neuroscience*, 100, (1–4).

**Autonomic Patterns During Respiratory Suspensions:
Possible Markers of Transcendental Consciousness**

■

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ABSTRACT

In two experiments, we investigated physiological correlates of Transcendental Consciousness during Transcendental Meditation sessions. In the first, experimenter-initiated bells, based on observed physiological patterns, marked three phases during a Transcendental Meditation session in 16 individuals. Interrater reliability between participant and experimenter for classification of experiences at each bell was quite good. During phases including Transcendental Consciousness experiences, skin conductance responses and heart rate deceleration occurred at the onset of respiratory suspensions or reductions in breath volume. In the second experiment, this autonomic pattern was compared with that during forced breath holding. Phasic autonomic activity was significantly higher at respiratory suspension onset than at breath holding onset. These easily measured markers could help focus research on the existence and characteristics of Transcendental Consciousness.

Descriptors: Skin conductance response, Heart rate deceleration, Transcendental Consciousness, Consciousness, Orienting, Transcendental Meditation

Introduction

Subjective experiences during a Transcendental Meditation session can be generally classified into three qualitatively different categories or phases: (a) the progressive reduction of mental and physical activity, called the *inward stroke*, (b) complete mental quiescence in which thoughts are absent and yet consciousness is maintained, referred to as a state of Transcendental Consciousness, and (c) the progressive increase of mental and physical activity, called the *outward stroke* (Maharishi, 1972; Wallace, 1986). In this study, we investigated physiological patterns during Transcendental Consciousness experiences and tested whether these patterns could discriminate Transcendental Consciousness from other meditation experiences.

Most studies investigating physiological parameters during Transcendental Meditation sessions have compared variables averaged over extended periods, typically 5-20 mins (Banquet, 1973; Fenwick et al., 1977; Hebert & Lehman, 1977; Stigsby, Rodenberg, & Moth, 1981). By averaging data over the entire meditation session, these studies combined the physiological patterns underlying the more active mental

processing of the inward and outward strokes with those underlying the mental quiescence of Transcendental Consciousness. Mixing data from all three periods would have confounded tests of the existence and uniqueness of Transcendental Consciousness and the comparison of it with eyes-closed rest, relaxation techniques, and other meditation techniques.

Three studies have investigated physiological markers during Transcendental Consciousness experiences. Farrow and Hebert (1982) reported results from a series of experiments in which they correlated incidents of respiratory suspensions with experiences of Transcendental Consciousness. They defined a respiratory suspension as any breath period that was more than twice the average breath period during the initial eyes-closed rest period. They observed 161 respiratory suspensions in 28 individuals during Transcendental Meditation sessions, compared with 19 respiratory suspensions in 23 age-matched resting control individuals. In a second experiment, they asked 11 people to press a button after Transcendental Consciousness experiences. To ensure that the participants were blind to the hypotheses being tested, the authors applied heart rate and skin conductance electrodes (but did not record these signals) and measured respiration covertly with a two-channel magnetometer. All participants pressed buttons during the Transcendental Meditation session, but only 8 of the 11 participants also exhibited respiratory suspensions. Among those eight individuals, 36 of 84 button presses occurred within 10 secs of the offset of 1 of 56 respiratory suspensions (64% hits). These data suggest that respiratory suspensions will probably be one of a constellation of variables characterizing Transcendental Consciousness, if Transcendental Consciousness can be characterized by a specific, measurable physiological pattern.

Badawi, Wallace, Orme-Johnson, and Rouzeré (1984) replicated and extended these findings. They reported 52 respiratory suspensions during Transcendental Meditation sessions in 54 individuals and none in 31 nonmeditating resting controls. They then compared electroencephalogram (EEG), spontaneous skin conductance response, and heart rate in 11 individuals during 19 respiratory suspensions and under two comparison conditions: during equal-length periods before and after respiratory suspensions (within subjects) and during voluntary

breath holding (between subjects). Respiratory suspensions were distinguished from the other two conditions by significant decreases in theta power and significant increases in 0–50-Hz global coherence (all pairs of EEG sites measured), but no consistent differences in spontaneous skin conductance response or heart rate were observed.

In a third study, Travis (1993) also investigated autonomic and EEG variables during respiratory suspensions. Because button presses require attending to and evaluating experiences which could interfere with the Transcendental Meditation technique, an extensive posttest interview was used to link physiological patterns to subjective experiences of Transcendental Consciousness. In this study, 6 of 20 individuals reported Transcendental Consciousness experiences. These experiences were marked by skin conductance responses and phasic heart deceleration at the onset of either respiratory suspensions or abrupt 40% decreases in breath volume in the 6–10-Hz band that were significantly greater than that during equal-length periods before and after. However, there were large individual EEG differences in frequency bands (7.0–9.5 Hz) and in scalp locations (frontal, central, or parietal).

These autonomic changes at the onset of breath changes are similar to those reported during orienting to novel or significant stimuli (Spinks, Blowers, & Shek, 1985; Vossel & Zimmer, 1989). Travis (1993) suggested that this phasic autonomic activity may mark the transition of awareness from active thinking processes to the silent, but alert state of Transcendental Consciousness.

These studies indicate that changes in breath, autonomic and EEG patterns may be markers of Transcendental Consciousness experiences. In the current investigation, we explored this psychophysiological relationship with two experiments. In the first, we sought to replicate the pattern of physiological changes—respiration suspensions, phasic autonomic activity, and EEG power changes—as markers of Transcendental Consciousness experiences, using a new paradigm. Rather than using button presses, which require the participant's continued vigilance during the session, the experimenter rang a quiet bell when the participant's physiological patterns indicated one of three meditation phases. After the experiment, participants recorded what they had experienced just before each bell ring. Subjective and objective ratings were compared, along with the physiological variables during each

phase. In the second experiment, we investigated physiological patterns during voluntary breath holding to test whether this physiological pattern could be produced intentionally, divorced from Transcendental Consciousness experiences, thus beginning to address the specificity of the previously observed patterns to Transcendental Consciousness experiences.

Experiment 1

Method

Participants

Sixteen graduate students were asked to participate in this study (6 women, 10 men; age: $M = 35.0$ years, $SD = 10.5$ years, range = 24.3–42.5 years), all of whom had been practicing the Transcendental Meditation technique for an average of 12.6 years ($SD = 9.0$ years, range = 0.4–22.5 years). Individuals practicing the Transcendental Meditation technique were used in this experiment because (a) all were familiar with the concept and experience of Transcendental Consciousness, (b) all had a shared terminology to describe their experiences, and (c) the intent of the study was to identify objective correlates of Transcendental Consciousness rather than to test whether this experience was unique to the Transcendental Meditation technique. Once this marker has been identified, then similar experiences may be investigated in other populations and during the use of other techniques. Also, the time course and critical factors for the emergence of Transcendental Consciousness experiences can be investigated.

Apparatus

EEG was recorded on a Grass 78D polygraph with a 1.0-Hz low filter, a 100-Hz high filter, and 5 $V/\mu\text{m}$ sensitivity. Electrodermal activity was recorded by Ag/AgCl electrodes with 1-cm double-stick collars, using K-Y[®] Jelly as conductive paste. Electrodermal activity was recorded on a Grass Model 78D polygraph with a constant 10 μA current across the electrodes and a sensitivity of 10.0 $k\Omega\text{cm}$. Heart rate was recorded with a Lead II configuration, right wrist to left leg. Breath rate was recorded with a Grass TCT-1 nasal thermistor.

Procedure

After participants washed their hands with soap and water, Ag/AgCl electrodes were secured to the distal phalanges of the left index and middle fingers with double-stick collars (Scerba, Freedman, Raine, Dawson, & Venables, 1992). EEG electrodes were applied with the Electro-Cap system (all 19 leads in the International 10–20 system [Jasper, 1958]) referenced to linked mandibles, with impedances below 5 k Ω , and heart and breath sensors were attached. Participants then moved into a sound-attenuated room with a closed-circuit video monitor. Physiological measures were recorded on a Brain Atlas III (Biologic Systems) during an eyes-open session (2 mins), an eyes-closed session (2 mins), and a Transcendental Meditation session (20 mins). (Data from the eyes-open and eyes-closed periods will be reported elsewhere.)

During the Transcendental Meditation session, the experimenter (F. Travis¹) rang a quiet bell at approximately equal intervals when he judged, by the physiological records, that the participant was in one of three meditation phases: inward stroke, Transcendental Consciousness, or outward stroke. This procedure resulted in three experience probes per session. Table I contains the criteria used to mark each phase. The criteria for the inward and the outward strokes were based on work by Taneli and Krahne (1987), who asked individuals to press a button immediately after the outward stroke during a Transcendental Meditation session. All button presses occurred after a period of desynchronized EEG and were followed by global synchronized alpha when the individual continued with the inward stroke of meditation. The criteria for Transcendental Consciousness experiences were based on Travis's (1993) findings. The 2-min segments of EEG, which included each bell ring during the Transcendental Meditation session, were digitized online at 256 atpoints/s. These EEG data were stored for later analysis. All physiological measures were continuously recorded on paper.

¹ Travis has practiced the Transcendental Meditation technique for 23 years and has researched the psychophysiological correlates of Transcendental Meditation practice for the last 10 years.

Table I. Criteria for Online Classification of Subjective Experiences During a Transcendental Meditation Session

Physiological variables	Experience category		
	Inward stroke	Transcendental Consciousness	Outward stroke
Breath Suspension ^a	no	yes	no
Abrupt reduction in breath volume ^b	no	yes	no
Heart rate deceleration ^c	no	yes	no
Skin conductance response ^d	no	yes	no
EEG ^e	yes	yes	no

^aAt least twice the average resting breath period. ^bAt least 30% decrease in peak/nadir of breath cycle compared with the two prior breaths. ^cAt least 8 bpm decrease in a 1–3-sec window following onset of breath changes. ^dAt least 0.2 μ S increase in a 1–3-sec window following onset of breath changes. ^eAlpha activity at frontal, central, and parietal leads.

After the recording session, but before speaking with the experimenter, the participants were asked to classify their experiences during the approximately 20-sec period before each bell ring. They were asked to use the following criteria: (a) for the inward stroke, free flowing mental activity with a sense of relaxation; (b) for Transcendental Consciousness, complete mental quiescence in which thoughts were absent and yet self awareness was maintained; and (c) for the outward stroke, being lost in thought and oblivious to the surroundings or a sense of increased physical and mental activity.

Although no one reported difficulty in making this forced choice response, in retrospect, it would have been preferable to include a fourth category, *none of the above*. In addition, it would have been better to signal participants during periods with ambiguous physiological indicators, for instance, respiratory suspensions without autonomic responses.

Data Quantification

Breath period, phasic autonomic activity, and EEG spectral estimates were calculated during the 20-sec period before each bell ring; 20 secs was long enough to include all respiratory suspension periods.

There is disagreement on the number of data points necessary to obtain stable spectral estimates of the scalp-recorded EEG. Tomarken, Davidson, Wheeler, and Kinney (1992), investigating temporal stability and internal consistency of anterior alpha during an eyes-open and an eyes-closed period, reported that stability will be underestimated when less than 4–5 mins of data (six 43-sec average-length periods) are used in the spectral estimates. However, Dumermuth and Molinari (1987a, p. 91) contended that there is “no definite general answer to this question.” They suggested that the research question determines the epoch length, with longer epochs being appropriate to address questions about spontaneous background activity (the intent of Tomarken et al.’s work) but shorter epochs being superior for assessing responses to stimuli and physiological patterns underlying tasks (Dumermuth & Molinari, 1987b). They also cautioned that long epochs may violate the stationarity assumption for spectral analysis. In the current study, using a period longer than 20-sec would have mixed physiological patterns of Transcendental Consciousness with other phases of meditation, confounding the very comparison being studied. Therefore, in light of these considerations, 20-sec segments of data were used, accepting that the error variance for the spectral estimates may be greater owing to potential instability of shorter blocks of data.

The longest breath period in the 20-sec period was calculated. Breath period was used instead of breath rate to eliminate the possible confound of different baseline respiration rates. For example, an average breath rate of eight breaths/min could result either from slow regular breathing with no respiratory suspensions or from faster breathing with an extended respiratory suspension. Breath volume was inferred from the peak/nadir of the breath cycle as plotted by the polygraph for all breaths in the 20-sec window. Any breath cycle with an inhale/exhale that was less than 70% of the average of the two preceding cycles was noted.

Heart rate deceleration and skin resistance were calculated in a 1–3-sec window from the onset of breath changes during those experience

probes with respiratory suspensions. This interval was chosen because it is the recommended window for calculating skin conductance response (Levinson & Edelberg, 1985) and heart rate response (Graham & Clifton, 1966; Vossel & Zimmer, 1989) to external stimuli. Phasic autonomic responses to the inner experience of Transcendental Consciousness—if that is what respiratory suspensions signal—would seem likely to follow the same time course as responses to outer stimuli. Skin resistance was calculated just prior to the respiratory suspension and at the peak amplitude in the 1–3-sec window. These skin resistances were converted to skin conductance levels $\mu\text{S} = 1,000/\text{k}\Omega$ (Dawson, Schell, & Fillion, 1990), and then differences were obtained to yield the magnitude of skin conductance responses. Heart rate deceleration in the same 1–3-sec window was calculated from the tachigram.

For experience probes without respiration changes, the maximum skin conductance response and heart rate deceleration was calculated in the 20-sec period. Skin conductance responses and heart rate deceleration during these 20-sec periods probably result in part from random events not directly related to the practice of the Transcendental Meditation technique. For instance, strong emotions or intense inner speech are reported to generate spontaneous skin conductance responses (Nikula, 1991), and heart rate variability also results from interaction with the respiratory cycle (respiratory sinus arrhythmia; Porges, 1995; Porges, McCabe, & Yongue, 1982). However, autonomic variables were calculated for these periods to manually approximate the steps an automated system might use to discriminate between phases of meditation. This approach was conservative and required more robust physiological changes during Transcendental Consciousness experiences to significantly discriminate between phases.

EEG was conditioned with a Hanning window, spectral analyzed in 1-sec epochs and then averaged over the 20-sec analysis period. (The Biologic spectral analysis routine does not overlap epochs to recover degrees of freedom lost due to windowing.) These spectral estimates were used to calculate theta (4–8 Hz) and alpha (8–12 Hz) power at the seven frontal electrodes (Fp1, Fp2, F7, F3, Fz, F4, F8) and six central-parietal electrodes (C3, Cz, C4, P3, Pz, P4). This yielded four scores: two regions and two frequency bands.

Data Analysis

Two research questions were tested. First, did respiration changes with phasic autonomic activity reliably discriminate Transcendental Consciousness experiences from other experiences during a Transcendental Meditation session? Second, did EEG variables also discriminate between meditation experiences? Autonomic and EEG variables were analyzed separately in light of prior research that has shown consistent autonomic changes, but various EEG changes, during reported Transcendental Consciousness experiences.

Two basic analysis strategies were used. First, interrater reliabilities were assessed between the participants' classification of experiences, the experimenter's online physiologically based classification, and a second rater's off-line classification. Second, two analyses of variance (ANOVAS) were run to determine possible condition differences: one with EEG variables and the other with breath and autonomic variables.

Results

The Transcendental Meditation technique is a dynamic process. Although each session begins with the inward stroke, the condition of the physiology (i.e., the degree of rest or the amount and quality of prior activity) determines the duration of phase and the transitions between phases throughout that meditation session (Maharishi, 1969, 1972). Individuals typically cycle through the inward stroke, Transcendental Consciousness (albeit briefly), and the outward stroke many times in each Transcendental Meditation session; however, specific experiences cannot be intentionally produced at specific times, and experiences vary within and between individuals. In the current study the experimenter was able to mark with bell rings clear experiences of all three phases of meditation for only 3 of the 16 participants. For eight additional participants, he was able to measure the experience of both the inward stroke and Transcendental Consciousness but not the outward stroke during this experimental session. Data during the inward stroke and Transcendental Consciousness experiences were analyzed and are reported here only for these 11 individuals because each participant contributed equally to all cells.

Sequence of Phases Within a Transcendental Meditation Session

Across these 11 participants, incidences of the inward stroke and Transcendental Consciousness were fairly evenly distributed throughout the meditation session. Of 11 reported Transcendental Consciousness experiences, 2 occurred in the beginning, 4 in the middle, and 5 at the end of the Transcendental Meditation session. Of 11 reported inward-stroke experiences, 4 occurred in the beginning, 3 in the middle, and 4 at the end. Therefore, elapsed time within the Transcendental Meditation session did not seem to substantially interact with phase.

Classification of Experiences

Because the data were categorical, Cohen's kappa was used to test interrater reliability of experience classifications (Rosenthal & Rosnow, 1991). Between the experimenter's and the participants' classification, the correlation coefficient was substantial, $\kappa = .650$, $t(10) = 2.56$, $p < .025$.² The experimenter and participant agreed on 10 out of 11 Transcendental Consciousness experiences (91% accuracy) and 9 out of 11 inward-stroke experiences.

After data were acquired, a research assistant, who was not involved in data acquisition, was given the physiological criteria in Table 1 and practiced classifying records from another study. Following this training, he independently assigned an experience category to each bell ring that was indicated on the paper records from this study. The interrater agreement was high, $\kappa = .755$, $t(10) = 3.39$, $p < .005$. Also, the association of the research assistant's classification with that of the participants was substantial, $\kappa = .621$, $t(10) = 2.38$, $p < .025$. The effect sizes of these correlations were calculated (Cohen, 1977) and were all very large ($d > 1.5$).

Physiological Patterns During Transcendental Consciousness and Inward Stroke

Table 2 presents means and standard errors for physiological variables for these 11 subjects during the inward stroke (left column) and Transcendental Consciousness (right column). Breath period and magnitude of heart rate deceleration and skin conductance responses were

² The t statistic was derived from the correlation coefficient using $t = r * [(n-2) / (1-r^2)]^{1/2}$ (Bruning & Kintz, 1977).

greater during Transcendental Consciousness. Also, theta power was lower and alpha power higher during Transcendental Consciousness experiences during the inward stroke.

Because ANOVAs are highly sensitive to outliers, the data were temporarily transformed to z scores. Any value above three standard deviations was considered an outlier (Stevens, 1984). Breath period and the autonomic variables were all below this criterion, and their distribution did not differ significantly from normality (Kolmogorov-Smirnov one-sample test of normality; skewness < 1.0), so further analysis of autonomic variables was conducted on the actual values. The EEG data, however, had three outliers (z scores ranging from 3.0 to 3.5), and the data differed significantly from normality (two-tailed $p < .001$; skewness ranged from 1.013 to 2.16). Therefore, the EEG data were log transformed, which produced more normal plots (skewness ranged from -0.165 to 0.770), before they were analyzed.

A $2 \times 2 \times 2$ ANOVA with one between-subjects variable (phase: inward stroke and Transcendental Consciousness), two within-subjects variables (frequency: theta and alpha; region: frontal and central-parietal), and log EEG power as the dependent variable revealed no significant main effects for location, two-tailed $t(87) = 2.58$, $p < .015$, with significantly higher alpha than theta power during both phases of meditation. There were no significant two-way or three-way interactions. The effect sizes for theta decreases and alpha increases during Transcendental Consciousness were medium in size. The values for d ranged from 0.4 for alpha increases to 0.6 for theta increases.

A single variable multivariate ANOVA (MANOVA) with two levels of phase and three dependent variables (breath period, skin conductance response, and heart rate deceleration) revealed a significant main effect for phase, Wilk's λ $F(3,18) = 3.33$, $p < .045$. The effect sizes for these three variables individually were large (all $d > 1.1$), and individual comparisons revealed significant phase differences for each variable: breath period: $F(1,20) = 6.88$, $p < .02$; heart rate variability: $F(1, 20) = 4.50$, $p < .05$; and skin conductance response: $F(1,20) = 7.09$, $p < .015$.

The data suggest that respiratory suspensions or marked reduction in breath volume with skin conductance responses and heart rate deceleration mark the onset of Transcendental Consciousness periods and could discriminate this phase during a Transcendental Meditation ses-

Table 2. Means (SE) of EEG and Autonomic Variables during the Inward Stroke and during Transcendental Consciousness Experiences

Parameter	Inward Stroke	Transcendental Consciousness
EEG variables:		
Theta frontal power (μV^2)	1,868 (335)	1,443 (215)
Theta central-parietal power (μV^2)	1,831 (421)	1,524 (234)
Alpha frontal power (μV^2)	2,060 (455)	2,167 (438)
Alpha central-parietal Power (μV^2)	3,547 (643)	4,491 (864)
Autonomic variables:		
Breath period (s)	5.7 (0.5)	8.6 (1.0)
Heart rate deceleration (<i>bpm</i>)	6.3 (1.3)	11.3 (1.9)
Skin conductance response (μS)	0.09 (0.06)	0.42 (0.10)

Note: Absolute power is presented here. The log of these values was used for statistical testing.

sion from other meditation experiences.³ The next experiment tested whether phasic autonomic activity always occurs at the onset of respiratory suspensions, even voluntary breath holding, and therefore is not specific to breath suspensions during Transcendental Consciousness periods. The discussion following this experiment examines the results from both experiments.

³ A descriptive analysis (Huberty, 1984) generated loadings for breath period (0.788), heart rate response (0.637), and skin conductance response (0.799) that successfully classified 9 of the 11 Transcendental Consciousness experiences. The two misclassified experiences included abrupt breath volume reductions with autonomic responses rather than breath suspensions, emphasizing the need to monitor both types of breath patterns to discriminate Transcendental Consciousness experiences.

Experiment 2

Method

Participants

Eleven undergraduate students (five women, six men) were invited to participate in this study. They had an average age of 20.5 years ($SD = 2.2$ years, range = 17.7–25.0 years) and had been practicing the Transcendental Meditation technique for an average of 6.1 years ($SD = 3.5$ years, range = 3.3–9.3 years).

These individuals were younger than those in the first experiment but still had extensive experience with the Transcendental Meditation technique. Because we are investigating the basic physiological relationship between breath patterns and autonomic activity, which we assume to be invariant across these ages, these differences in age should not seriously bias the results.

Procedure

The electrode placement and procedures were the same as in the first experiment. In addition, at the end of the protocol, participants were asked to hold their breath for 15–20 secs, breathe normally two to three times, and then hold their breath again; they repeated this four or five times. We did not signal the participants to begin and end breath holding because they would have oriented to the instruction, confounding the intended comparison.

Results

Skin conductance response and heart rate deceleration were calculated in a 1–3-secs window following the onset of breath holding. These phasic autonomic patterns were compared with those seen at the onset of spontaneous respiratory suspensions in the subjects in the first experiment.

Breath patterns during voluntary breath holding differed markedly from those during respiratory suspensions. Voluntary breath holding usually commenced at a large inhale and ended with compensatory breathing. Also, the thermistor trace during voluntary breath holding was completely flat, without the small fluctuations reflecting the heart/lungs interaction seen during Transcendental Consciousness experiences.

Autonomic patterns also differed markedly between conditions. Table 3 presents means and standard errors for magnitude of skin conductance response (left column) and heart rate deceleration (right column) at the onset of voluntary breath holding (top) and spontaneous breath suspensions (bottom). The magnitude of skin conductance response and heart rate deceleration were greater at the onset of spontaneous respiratory suspensions than at the onset of voluntary breath holding. A single-variable MANOVA with two levels of condition (spontaneous and voluntary respiratory suspensions) and two dependent variables (skin conductance response and heart rate deceleration magnitudes) tested possible condition differences. There was a significant main effect for condition, Wilks λ $F(2,19) = 9.5$, $p < .001$. Also, individual comparisons revealed significant condition differences for each variable separately: skin conductance response $F(1,20) = 7.79$, $p < .015$; heart rate deceleration: $F(1,20) = 11.45$, $p < .002$. The effect sizes were again very large for both variables ($d > 2.7$).

Discussion

These data extend earlier findings. Farrow and Hebert's (1982) and Badawi et al.'s (1984) work suggested an outcome relationship between breath suspensions and Transcendental Consciousness experiences.

The current study is the first step toward testing the property of specificity (Cacioppo & Tassinari, 1990) of this relationship. The physiological pattern of breath suspensions or marked reductions in breath volume, skin conductance responses and heart rate deceleration accurately marked 10 of 11 Transcendental Consciousness experiences, and discriminated them from other meditation experiences. In the second experiment, breath patterns and phasic autonomic activity were significantly lower at the onset of voluntary breath holding than at the onset of spontaneous respiratory suspensions. Further research will test the generality of this relationship—if it is seen across situations (both during and outside a Transcendental Meditation session) and individuals (in other individuals reporting a similar experience, but not practicing the Transcendental Meditation technique)—and will further test the specificity of the relationship—if this physiological pattern covaries only with changes in Transcendental Consciousness experiences.

Table 3. Means (SE) of Magnitude of Skin Conductance Response and Heart Rate Deceleration During Voluntary Breath Holding and During Spontaneous Breath Suspensions

	Skin conductance response (μ S)	Heart rate deceleration (<i>bpm</i>)
Voluntary breath holding	0.14 (0.09)	2.4 (3.4)
Spontaneous breath suspensions	0.42 (0.10)	-11.3 (1.9)

Skin conductance changes may have been detected in this study but missed by earlier researchers because of improved methodologies. Previous researchers used palmar skin conductance, whereas in the current study we recorded electrodermal activity from distal phalanges which are reported to be more sensitive to changes in sympathetic activity (Scerba et al., 1992). Also, previous researchers used EC-2 cream (Farrow & Hebert, 1982, p. 139), an electrode gel with saturated salt concentrations that “will result in a continuous fall of SCL and SCR amplitude over time” (Venables & Christie, 1973, p. 80), exactly what previous researchers reported during respiratory suspensions. In the current study, we used K-Y Jelly, which Grey and Smith (1984) reported was comparable (for measuring skin conductance responses) to a custom NaCl paste similar to that recommended by Fowles et al. (1981). Future studies using the recommended Unibase gel are needed to replicate these skin conductance findings during Transcendental Consciousness.

EEG differences between Transcendental Consciousness and the inward stroke observed in this study (decreased theta and increased alpha power) were also reported by Badawi et al. (1984). In the current study, these EEG differences did not reach significance because of high interindividual variability. As in the general population (Nunez, 1981), 2 of the 11 participants (20%) did not exhibit eyes-closed posterior alpha, and likewise they did not exhibit peaks in anterior or posterior theta or alpha activity during their Transcendental Meditation session. Variability may have been further increased by the short epochs used

and the software limitations on overlapping epochs before spectral analyses. From these data, autonomic variables seem more robust and reliable as markers of Transcendental Consciousness experiences than EEG. Compared with EEG measures, breath and autonomic differences (a) were larger in effect size, b) were seen before all respiratory suspension periods in experience probes identified as containing Transcendental Consciousness experiences, and (c) could be used to correctly classify 9 out of 11 Transcendental Consciousness experiences in a multiple discriminant analysis.

Social Desirability: A Possible Alternative Explanation

Because these participants all practiced the Transcendental Meditation technique, they likely wanted to “make the experiment work.” Participants could have been aware of earlier studies linking breath changes with Transcendental Consciousness experiences and so may have reported a Transcendental Consciousness period whenever their breath was very shallow before a bell ring.

This could have been a major confound if the mean difference in breath period during the inward phase and Transcendental Consciousness was large, for instance, 20–30 secs. However, mean breath period differed by only 3 secs between phases (5.7 vs. 8.6 secs). Because the participants classified their experiences at the end of the 20-min session, it does not seem likely that they could use such small differences in breath period as their criterion. It seems more reasonable that a qualitative shift in experience, as reflected in the phasic autonomic activity at respiratory suspension onset, would be remembered at the end of the 20-min session and would be used as the basis for classifying experiences.

This conclusion is supported by the participants’ descriptions of Transcendental Consciousness experiences. None mentioned changes in breathing in their descriptions. Rather, typical reports were “I was unaware of my body,” or “I experienced deep silence,” or “I experienced waves of intense happiness.” Therefore, social desirability would not seem to account for these data.

Possible Impact of the Forced Choice of Subjective Experiences

The primary impact of not giving a fourth or other category for classification of experiences during a Transcendental Meditation session was

probably to add “noise” to the data. Any experience that was in reality a mixture of phases would have been forced into one or another category. Perhaps all the experiences classified as Transcendental Consciousness by these participants were not “pure” Transcendental Consciousness experiences but included other psychological experiences and corresponding physiological patterns. Despite this possible confound, the interrater reliability was significantly better than chance, and the resulting autonomic variables were significantly different during the inward stroke from those during the Transcendental Consciousness experiences.

Therefore, this confound did not seem to fatally affect these results. It is, however, an important design issue for future research.

Consideration of Breath Patterns During Transcendental Consciousness

During the respiratory suspensions, small fluctuations were seen in the breath trace, that is, it was not absolutely flat, probably because of the mechanical interaction between the heart and lungs, a relationship known since 1905 (Haldane & Priestly, 1905). During the systole phase when the blood is ejected, a vacuum is created in the lung cavity, drawing the air in; during the diastole phase, the heart fills with blood, pushing the air out (Fukuchi, Roussos, Macklem, & Engel, 1976).

Although breath appeared to be suspended during Transcendental Consciousness, suggesting apneas, Kesterson and Clinch (1989), using a spirometer, reported that slow inhalation or apneusis occurs during these periods. Apneustic breathing was not detected in the present study because the Grass nasal thermistors used were not sensitive to very slow breath flow.

Fully developed apneustic breathing is rare in humans. Clinically, it is thought to reflect damage to the respiratory control centers located at the mid or caudal-pontine levels, approximately at and below the location of the nucleus parabrachialis (Plum & Posner, 1980). However, in the current study, all participants reporting Transcendental Consciousness were healthy and did not report past diseases or accidents that would have resulted in brainstem damage. Also, these individuals exhibited apneustic breathing only during reported Transcendental

Consciousness experiences, and these apneuses lasted an average of 8.5 secs, in contrast to the 2-3-sec durations in clinical reports.

Kesterson and Clinch (1989) theorized that apneustic breathing during Transcendental Consciousness suggests that breath during this period is driven by different brainstem nuclei, namely the parabrachialis medialis, which respond to changes in O_2 concentrations rather than changes in CO_2 concentrations (Plum & Posner, 1980). The parabrachialis medialis are located in the same area of the lateral pons as the raphe and locus coeruleus, whose activities are responsible for modulating waking and sleeping (Imeri, Moneta, & Maria, 1988; Steriade, McCormick, & Sejnowski, 1993) and the REM-on cells that become active during phasic REM (Sakai, 1988).

Parallels Between Autonomic Patterns at the Onset of Transcendental Consciousness and Autonomic Patterns During Orienting

Skin conductance response and heart rate deceleration are markers of orienting attention switching to environmental stimuli that are novel (O'Gorman, 1979; Sokolov, 1963) or significant (Maltzman, 1977; Spinks et al., 1985). Orienting is characterized by a delay in respiration that is followed by slower, deeper breathing, marked skin conductance responses and heart rate deceleration, desynchronized EEG, dilation of cerebral blood vessels and constriction of peripheral blood vessels; and increased sensitivity of the sense organs (Cacioppo & Petty, 1983). This physiological response pattern is similar to the pattern observed at the onset of respiratory suspensions in the current study.

We suggest that skin conductance response and heart rate deceleration at the onset of breath changes during a Transcendental Meditation session mark the transition of awareness from active thinking processes to the mental quiescence of Transcendental Consciousness. This skin conductance orienting was not in response to a novel experience; it was seen repeatedly in a single 20-min Transcendental Meditation session and in individuals with extensive Transcendental Meditation experience. Rather, the observed skin conductance orienting suggests that Transcendental Consciousness is a significant experience to these individuals and that this distinct subjective experience has distinguishing physiological markers. Further studies will shed light on the neural

mechanisms underlying Transcendental Consciousness and its relationship to other experiences and states of consciousness.

References

- Badawi, K., Wallace, R. K., Orme-Johnson, D. & Rouzere, A. M. (1984). Electrophysiological characteristics of respiratory suspension periods occurring during practice of the Transcendental Meditation program. *Psychosomatic Medicine*, 46, 267–276.
- Banquet, J. P. (1973). Spectral analysis of the EEG in meditators. *Electroencephalography and Clinical Neurophysiology*, 35, 143–151.
- Bruning, J. L. & Kintz, B. L. (1977). *Computational handbook of statistics*. Glenview, IL: Scott Foresman & Co.
- Cacioppo, J. T. & Petty, R. E. (1983). Foundations of social psychophysiology. In J. T. Cacioppo & R. E. Petty (Eds.), *Social psychophysiology* (pp. 3–36). New York: Guilford.
- Cacioppo, J. T. & Tassinary, L. G. (1990). Inferring psychological significance from physiological signals. *American Psychologist*, 4, 16–28.
- Cohen, J. (1977). *Statistical power analysis for the behavioral sciences*. New York: Academic Press.
- Dawson, M. E., Schell, A. M. & Filion, D. L. (1990). The electrodermal system. In J. T. Cacioppo & L. G. Tassinary (Eds.), *Principles of psychophysiology* (pp. 295–324). New York: Cambridge University Press.
- Dumermuth, G. & Molinari, L. (1987a). Spectral analysis of the EEG. *Neuropsychobiology*, 17, 85–99.
- Dumermuth, G. & Molinari, L. (1987b). Spectral analysis of the EEG background activity. In A. S. Gevins & A. Remond (Eds.), *Methods of analysis of brain electrical and magnetic signals, EEG handbook* (Vol. 1, pp. 85–130). New York: Elsevier.
- Farrow, J. T. & Hebert, J. R. (1982). Breath suspension during the Transcendental Meditation technique. *Psychosomatic Medicine*, 44, 133–153.
- Fenwick, P. B. C., Donaldson, S., Gillis, L., Bushman, J., Fenton, G. W., Perry, I., Tisley, C. & Serafinowicz, K. (1977). Metabolic and EEG changes during Transcendental Meditation: An explanation. *Biological Psychology*, 51, 101–118.

- Fowles, D., Christie, M. J., Edelberg, R., Grings, W. W., Lykken, D. T. & Venables, P. H. (1981). Publication recommendations for electrodermal measurements. *Psychophysiology*, 18, 232–239.
- Fukuchi, Y., Roussos, C. S., Macklem, P. T. & Engel, L. A. (1976). Convection, diffusion, and cardiogenic mixing of inspired gas in the lung: An experimental approach. *Respiratory Physiology*, 26, 77–89.
- Graham, F. K. & Clifton, R. K. (1966). Heart-rate change as a component of the orienting response. *Psychological Bulletin*, 65, 305–320.
- Grey, S. J. & Smith, B. L. (1984). A comparison between commercially available electrode gels and purpose-made gels, in the measurement of electrodermal activity. *Psychophysiology*, 21, 551–557.
- Haldane, J. S. & Priestley, J. G. (1905). The regulation of lung ventilation. *Journal of Physiology*, 32, 225–266.
- Hebert, R. & Lehrman, D. (1977). Theta bursts: An EEG pattern in normal subjects practicing the Transcendental Meditation technique. *Electroencephalography and Clinical Neurophysiology*, 35, 143–151.
- Huberty, C. J. (1984). Issues in the use and interpretation of discriminant analysis. *Psychophysiology*, 95, 156–171.
- Imeri, L., Moneta, M. E. & Maria, A. M. (1988). Changes in spontaneous activity of medialis dorsalis thalamic neurones during sleep and wakefulness. *Electroencephalography and Clinical Neurophysiology*, 69, 82–84.
- Jasper, H. H. (1958). Report of committee on methods of clinical examination in EEG: Appendix: The ten-twenty electrode system of the International Federation. *Electroencephalography and Clinical Neurophysiology*, 10, 371–375.
- Kesterson, J. & Clinch, N. (1989). Metabolic rate, respiratory exchange ratio, and apneas during meditation. *American Physiological Society*, 89, R632–R638.
- Levinson, D. F. & Edelberg, R. (1985). Scoring criteria for response latency and habituation in electrodermal research: A critique. *Psychophysiology*, 22, 417–426.
- Maharishi Mahesh Yogi. (1969). *Maharishi Mahesh Yogi on the Bhagavad-Gita*. New York: Penguin.
- Maharishi Mahesh Yogi. (1972). *The science of creative intelligence*. Livingston Manor, NY: Age of Enlightenment Press.

- Maltzman, L. (1977). Orienting in classical conditioning and generalization of the galvanic skin response to words: An overview. *Journal of Experimental Psychology: General*, 106, 111–119.
- Nikula, R. (1991). Psychological correlates of non-specific skin conductance responses. *Psychophysiology*, 28, 86–90.
- Nunez, P. (1981). *Electric fields of the brain*. New York: Oxford University Press.
- O’Gorman, J. G. (1979). The orienting reflex: Novelty or significance detector? *Psychophysiology*, 16, 253–262.
- Plum, F. & Posner, J. B. (1980). *The diagnosis of stupor and coma*. Philadelphia: F. A. Davis.
- Porges, S. W. (1995). Orienting in a defensive world: Mammalian modifications of our evolutionary heritage. A polyvagal theory. *Psychophysiology*, 32, 301–318.
- Porges, S. V., McCabe, P. M. & Yongue, B. (1982). Respiratory heart rate interactions: Psychophysiological implications for pathophysiology and behavior. In J. Cacioppo & R. Petty (Eds.), *Perspective in cardiovascular psychophysiology* (pp. 223–264). New York: Guilford Press.
- Rosenthal, R. & Rosnow, R. L. (1991). *Essentials of behavioral research*. New York: McGraw-Hill.
- Sakai, K. (1988). Executive mechanisms of paradoxical sleep. *Archives Italiennes de Biologie*, 126, 239–257.
- Scerba, A. S., Freedman, L. W., Raine, A., Dawson, M. E. & Venables, P. (1992). A major effect of recording site on measurement of electrodermal activity. *Psychophysiology*, 29, 241–246.
- Sokolov, E. N. (1963). *Perception and the conditioned reflex*. Oxford: Pergamon.
- Spinks, J. A., Blowers, G. H. & Shek, D. T. L. (1985). The role of the orienting response in the anticipation of information: A skin conductance response study. *Psychophysiology*, 22, 385–394.
- Steriade, M., McCormick, D. A. & Sejnowski, T. J. (1993). Thalamicocortical oscillations in the sleeping and aroused brain. *Science*, 262, 679–685.
- Stevens, J. P. (1984). Outliers and inferential data points in regression analysis. *Psychological Bulletin*, 95, 334–344.

- Stigsby, B., Rodenberg, J. C. & Moth, H. B. (1981). EEG findings during mantra meditation (TM): A controlled quantitative study of experienced meditators. *Electroencephalography and Clinical Neurophysiology*, 81, 434–442.
- Taneli, B. & Krahne, W. (1987). EEG changes of Transcendental Meditation practitioners. *Advances in Biological Psychiatry*, 16, 41–71.
- Tomarken, A., Davidson, R., Wheeler, R. E. & Kinney, L. (1992). Psychometric properties of resting anterior EEG asymmetry: Temporal stability and internal consistency. *Psychophysiology*, 29, 576–592.
- Travis, F. T. (1993). Respiratory, autonomic, and EEG correlates of Transcendental Consciousness experiences during Transcendental Meditation practice. *Society for Neuroscience Abstracts*, 18(1), 574, 15.
- Venables, P. H. & Christie, M. J. (1973). Mechanisms, instrumentation, recording techniques and quantification of responses. In W. F. Prokasy & D. C. Raskin (Eds.), *Electrodermal activity in psychological research* (pp. 1–109). New York: Academic Press.
- Vossel, G. & Zimmer, H. (1989). Heart rate deceleration as an index of the orienting response? *Journal of Psychophysiology*, 3, 111–124.
- Wallace, R. K. (1986). *The neurophysiology of enlightenment*. Fairfield, IA: MIU Press.

This article “Autonomic Patterns During Respiratory Suspensions: Possible Markers of Transcendental Consciousness,” by Frederick Travis, Ph.D., and Robert Keith Wallace, Ph.D., here revised/updated, and reprinted with permission, was originally published in *Psychophysiology*, 34 (1997), 19–46. Cambridge University Press. Printed in the USA. Copyright ©1997 Society for Psychophysiological Research.

We thank the two anonymous reviewers for their extensive comments on earlier versions of this manuscript. We also thank Chris Durcholz, Thom Richards, and Ted Wallace for their help in data acquisition.

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**Electrophysiological Correlates of Higher States of
Consciousness During Sleep
In Long-Term Practitioners of
the *Transcendental Meditation* Program**

■

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ABSTRACT

Standard ambulatory night sleep electroencephalograph (EEG) of 11 long-term practitioners of the Transcendental Meditation program reporting “higher states of consciousness” during sleep (the experimental group) was compared to that of nine short-term practitioners and 11 non-practitioners. EEG tracings during stages 3 and 4 sleep showed the experimental group to have: 1) theta-alpha activity simultaneously with delta activity and 2) decreased chin electromyograph (EMG) during deep sleep ($p = 0.002$) compared to short-term practitioners. Spectral analysis fast Fourier transform (FFT) data of the first three cycles showed that: 3) the experimental subjects had significantly greater theta2 (6–8 Hz)-alpha1 (8–10 Hz) relative power during stages 3 and 4 than the combined control groups [$t(30) = 5.5$, $p = 0.0000008$] with no difference in time in delta; 4) there was a graded difference across groups during stages 3 and 4 in theta2-alpha1 power, with experimentals having greater power than short-term practitioners, who in turn had greater power than non-practitioners [$t(30) = 5.08$, $p = 0.00002$], and 5) experimentals also had increased rapid eye movement (REM) density during REM periods compared to short-term practitioners ($p = 0.04$). Previous studies have found increased theta-alpha EEG activity during reported periods of “Transcendental Consciousness” during the Transcendental Meditation technique. In the Vedic tradition, as described by Maharishi Mahesh Yogi, Transcendental Consciousness is the first of a sequence of higher states. The maintenance of Transcendental Consciousness along with deep sleep is said to be a distinctive criterion of further, stabilized higher states of consciousness. The findings of this study are interpreted as physiological support for this model.

Introduction

Throughout history, various cultures have described the existence of so-called “extraordinary” states of awareness beyond waking, dreaming, and sleeping (1, 2). While such transcendental experiences in the West are often considered ephemeral or momentary (1), the ancient Eastern view of development emphasizes their possible maintenance in daily life outside practices such as meditation (3–6).

In particular, Maharishi Mahesh Yogi’s Vedic Psychology describes the existence of “higher states of consciousness” with values of self-

awareness qualitatively distinct from those experienced during the ordinary states of waking, sleeping, and dreaming (4–6). According to this model (4–6), the first higher state of consciousness experienced beyond the three ordinary states is termed “Transcendental Consciousness”(4). Transcendental Consciousness is described as a deeply restful yet fully alert state of inner wakefulness with no object of thought or perception (5). The Transcendental Meditation program involves a mental technique held to promote the experience of Transcendental Consciousness. Self-reported experiences of Transcendental Consciousness during practice of the Transcendental Meditation technique have been shown to be correlated with a stable, non-descending theta-alpha (7–9 Hz) pattern and breath suspensions (7–14).

Further, this model (4–6) holds that Transcendental Consciousness is not only experienced in a transitory manner during the Transcendental Meditation technique, but through repeated regular practice, it comes to be spontaneously maintained throughout daily life. When Transcendental Consciousness is continuously maintained during waking, dreaming, and especially deep sleep, then the first of three permanent higher states of consciousness is said to be stabilized (4). The term “witnessing” is used to describe this state because Transcendental Consciousness is experienced to be a non-changing level of awareness that serves as a peaceful inner observer or “silent witness” to the active, changing states of waking, dreaming, and sleeping.

Previous studies of participants in the Transcendental Meditation program have found evidence of delta waves and alpha spindles during deep sleep (8), a beta pattern during light sleep (8), a significantly higher ratio of high-frequency rapid eye movements (REMS) to low-frequency REMs (15), increased REM density during REM periods (15), and significant peaks in theta-alpha power during the brief transitions between waking, non-rapid eye movement (NREM)-sleep, and REM-dreaming (16). These studies (8,16) were not necessarily done with subjects who reported witnessing sleep.

A phenomenological experience with some similarities to witnessing is lucid dreaming. Lucid dreaming is the condition of being aware that one is dreaming while the dream goes on and requires a combination of detachment and participation (17). In contrast, in subjective accounts of witnessing the dream state, one is completely separate from and unin-

volved in the dream activity and completely identified with Transcendental Consciousness (18). Pilot studies suggest that lucid dreaming involves a more active mental state corresponding to greater physiological arousal than witnessing dreaming (19–22), but it is premature to conclude at this point that lucid dreaming and witnessing dreaming are completely distinct phenomena, and they may represent a continuum of experiences (22).

Based on maintenance of Transcendental Consciousness along with deep sleep as the primary criterion of putative higher states of consciousness, we predicted that subjects reporting a higher state of consciousness during sleep would display a greater theta-alpha (6–10 Hz) activity that is typically associated with Transcendental Consciousness, occurring along with the delta Hz pattern typical of sleep stages 3 and 4. To avoid possible misinterpretation of the results, a number of diseases and sleep disorders including sleep state misperception, insomnia, parasomnias, pain, and fibrositis (23–26) that involve polysomnographic atypical alpha (primarily an *alternating* alpha with delta pattern) were screened for in the present study. Furthermore, the electroencephalograph (EEG) spectral analysis concentrated on NREM stages 3 and 4, as opposed to REM or stage 2, to avoid confusion with lucid dreaming (19–22) or “wakeful-like” stage 2 reports (27).

Methods

Subjects

Experimental subjects (nine female, two male) were healthy, long-term practitioners of the Transcendental Meditation technique [mean and standard deviation (SD) = 17.8 ± 4.9 years of practice] who reported higher states of consciousness during sleep. One group of control subjects (nine female, two male) consisted of short-term practitioners of the Transcendental Meditation technique (1.4 ± 0.8 years) who were matched for left- or right-handedness with the experimentals but reported no experiences of higher states of consciousness during sleeping. EEG recordings for two female short-term control subjects were not analyzable due to loss of data in the analog-to-digital (A/D) tape-transfer procedure. All subjects practicing the Transcendental Meditation technique were volunteers who were either directly affiliated with Maharishi University of Management in Fairfield, IA, or were living in

the surrounding community. All subjects were currently free of medication, had not used tobacco products for at least 1 year, and consumed alcohol and caffeinated beverages only rarely.

A second control group of 13 females ranging in age from 21 to 36 (29.5 ± 1.5 years) who had not practiced the Transcendental Meditation technique was also available. As in the case of the Transcendental Meditation subjects, these women were judged healthy and did not use tobacco products or consume alcoholic beverages. One of these subjects was left-handed, approximately matching the experimental group (two left-handed) and the short-term controls (two left-handed). Two of the non-practitioner controls were eliminated due to their inability to fall asleep or indications of periodic leg movements.

One design priority was to contrast practitioners of the Transcendental Meditation technique who were witnessing sleep with the short-term, non-witnessing control group. Witnessing has been found to increase with length of time meditating (6). Thus, to better ensure a witnessing-free control group, we chose controls who were short-term in their length of practice and who also reported no subjective experiences of witnessing.

The short-term practitioners tended to be younger than long-term practitioners because in this relatively youthful University setting 1) most of the new practitioners were younger and 2) many of the older new practitioners who could be located had begun the Transcendental Meditation program on the advice of a physician as treatment for a pre-existing health problem, which made them ineligible for participation in the study. Because the witnessing subjects had usually practiced the Transcendental Meditation technique for many years they tended to be older. Thus, as a result of our design priorities, the experimental group had the older mean age of 39.7 ± 5.0 years, ranging from 31 to 50, compared to the short-term practitioners' mean age of 27.1 ± 4.8 years, ranging from 24 to 36, a difference that was significant [$t(18) = 5.680$, $p = 0.00002$] (see Discussion).

Data from the non-practitioner group were acquired through a collaborative effort with Duke University Sleep Laboratory (Marsh and Elias, in preparation). The data were deemed acceptable for comparison to the Transcendental Meditation practitioner data because the training, research procedures, montage, type of recording equipment, and

software analysis package were all the same. All data were transformed from analog to digital at the Duke facility. The bands analyzed for the non-practitioner group were $\theta_2 = 6\text{--}7.75$ Hz and $\alpha_1 = 8\text{--}10$ Hz. The bands analyzed for the experimental subjects and short-term controls were $\theta_2 = 6\text{--}7.75$ Hz and $\alpha_1 = 8\text{--}9.75$ Hz. Although the alpha bands were a quarter of a hertz wider for the non-practitioner control group than for either of the Transcendental Meditation groups, contribution to the relative power comparisons, if any, would be minimal and would oppose the predicted differences. Bands are referred to below as 6–8 Hz or 8–10 Hz for easy comprehension.

Procedures

Health problems were evaluated with a written health history for all three groups. A mental health questionnaire (28) was administered to experimental subjects and short-term Transcendental Meditation controls to exclude those suffering from mental illness; no such subjects were identified. Basic criteria for the subjective experience of witnessing during sleep were a self-reported affirmation that “I experience a quiet, peaceful inner awareness or wakefulness during deep sleep” and awaking refreshed from sleep. The criterion for both control groups’ experiences was that they “lost conscious awareness while sleeping.” Experience of growth toward a higher state of consciousness during sleep was determined using the M-scale (29), The States of Consciousness Inventory (SCI) (30), a sleep experience questionnaire, and an in-depth structured interview with complete agreement on scores by two independent judges.

Experimental subjects and short-term controls maintained their usual bedtimes, and if they awoke earlier, they were instructed to simply remain in bed until 6:00 a.m. They avoided napping, alcohol, drugs, and caffeine. Non-practitioner controls went to bed at their usual bedtimes, but if they arose earlier, they had the option to leave their beds. (This difference of procedure would not have influenced the primary measurement because it involved only the first three sleep cycles.) All subjects gave an account of their activity level and current state of health immediately before recording and upon awakening, completed a standard sleep questionnaire [similar to (31)] with additional questions on pain, as well as on higher states of consciousness for Transcenden-

tal Meditation practitioners. Information on menstrual cycle stage (32) was required of all female subjects.

All three groups were recorded in their homes (33) with monopolar recordings from C3 to A2, from C4 to A1, electrooculograph (EOG) (upper and lower outer canthus), and electromyograph (EMG) (mental and submental) with a recording time constant of 0.3 secs and a high filter of 45 Hz using Oxford Medilog 9000 recorders (Oxford Medical Ltd., Clearwater, FL). All procedures conformed to the Declaration of Helsinki.

Electrophysiological analysis

A 100-microvolt EEG channel calibration signal was provided using Medilog XM-90. Data were digitized at 128 points/sec (a constraint of the recording equipment) with tape stabilization and transferred with a Scientific Solutions (Solon, OH) A/D board model AD221 at 20X speed for all three groups. Recordings were visually scored for sleep states, artifacts were rejected, and NREM and REM sleep cycles were defined according to established criteria (34). Data were conditioned using Hanning cosine-tapered windows and were spectral analyzed using fast Fourier transformations (FFTS) from EEG SYS analysis software (Friends Medical Science Research Center, Baltimore, MD, Sleep 5.21) in 4-sec windows.

Automatic (EEGSYS) rapid eye movement analysis was based on minimum amplitude of 30 microvolts base to peak with a minimum of 250 millisecond intervals between eye movements and REM density calculations on 20 sec epochs. The EMG analysis was based on the lowest quartile of EMG relative power with a time constant of 1 sec (35). To control for individual differences in muscle tone, EMG was standardized relative to mean waking values.

Statistical methods

First, time spent in different states of sleep was analyzed to determine possible differences in sleep architecture. This was followed by an analysis of power in the delta band. As noted previously, because the witnessing group had been meditating substantially longer and thus was older than the short-term practitioners, it was anticipated that age would be confounded with (and, in part, a proxy variable for) treatment

status. To assess this expectation, we determined the strength of inter-correlations of group status, length of time meditating, and age. For the main outcomes, a global comparison was performed using analysis of variance (ANOVA) to assess possible differences between the groups in the average theta2-alpha1 relative power during the first three cycles of stages 3 and 4 sleep. ANOVA tables were reviewed to determine the sources of variation attributed to treatment status and age for the global comparison. Then, five planned contrasts with ANOVA were performed for three groups with treatment status as the independent variable and relative theta2-alpha1 power as the dependent variable. We then tested the homogeneity-of-slopes assumption to determine the statistical appropriateness of covarying for age. To be conservative, we then performed the five planned contrasts covarying for age. Last was the analysis of the EMG, REM density, and psychological measures. Although directional predictions are necessary for planned contrasts, all test results are shown two-tailed also to be conservative.

Results

Sleep architecture

Table 1 presents the means and standard deviations for parameters of sleep architecture. There were no significant differences between groups in standard sleep measures except in stage 1 sleep and time spent in bed. These were apparently due to variations in procedures, as previously explained (see Procedures).

Visual inspection of raw EEG records from the witnessing group indicated a distinctive and pronounced appearance of theta-alpha waves simultaneously riding, the delta of stages 3 and 4 sleep. There were also periods of low EMG during delta sleep.

Figure 1 presents an EEG tracing during stage 3 of a representative 45-year-old female long-term practitioner reporting experiences of witnessing during sleep. The first line (C3–A2) and the third line (C4–A1) show the simultaneous theta-alpha waves and delta activity. The second line presents eye movement activity. The fourth line shows decreased EMG during stage 3 sleep.

Table 1. Visually scored sleep measures, means, and standard deviations

Sleep Measures	Group 1 witnessing experimental group (n = 1) Mean (SD)	Group 2 short-term practitioner control group (n = 9) Mean (SD)	Group 3 non- practitioner control group (n = 1) Mean (SD)	ANOVA for all three groups	
				F value (df)	p value
Total time in bed (minutes)	460(47)	496(68)	409(71)	4.95(2.28)	< 0.05**
Stage 2 latency (minutes)	32(23)	24(22)	16(5.5)	2.06(2.28)	ns
Total stage 1 (minutes)	78(31)	51(19)	11(4)	22.3(2.28)	< 0.001**,***
Total stage 2 (minutes)	144(55)	191(47)	171(34)	2.62(2.28)	ns
Total stages 3, 4 (minutes)	78(43)	77(31)	96(40)	0.79(2.28)	ns
Total REM (minutes)	79(30)	94(32)	93(28)	0.83(2.28)	ns
REM latency (minutes)	85(28)	85(25)	75(26)	0.57(2.28)	ns
Awake after onset (minutes)	15(14)	6(14)	32(17)	0.51(2.28)	ns
Movement time (minutes)	4(8)	3(3)	1(1.3)	0.12(2.28)	ns
Cycle 1–3 stage 1 (minutes)	40(21)	33(15)	6(3)	61.4(2.28)	< 0.001*,**,***
Cycle 1–3 stages 3,4 (minutes)	69(36)	70(21)	85(32)	0.79(2.28)	ns
SD, standard deviation; df, degree of freedom; REM, rapid eye movement; ns, $p > 0.05$					
Group comparison: * $p < 0.05$ between group 1 and group 2; ** $p < 0.05$ between group 2 and group 3; *** $p < 0.05$ between group 1 and group 3					

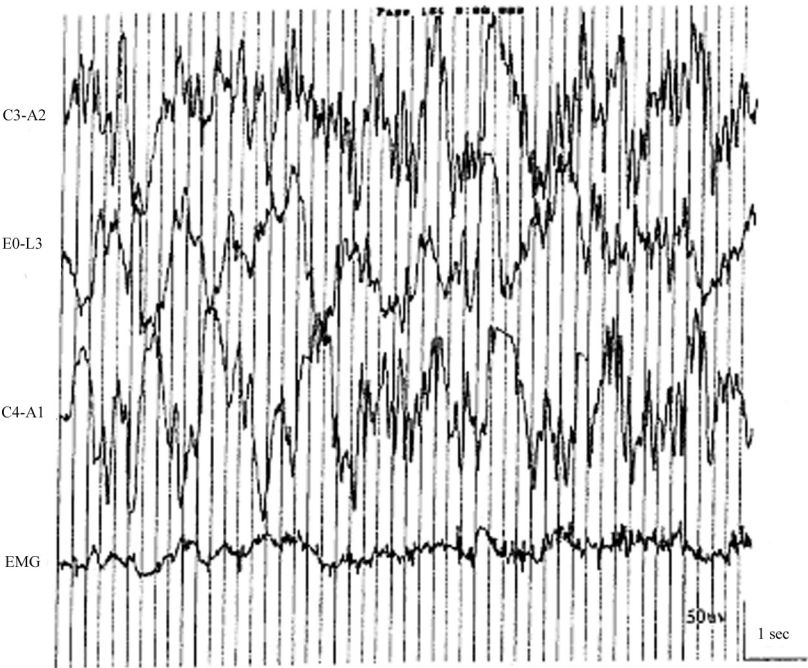


Fig. 1. Electroencephalograph (EEG) tracing from a healthy 45-year-old female reporting experiences of higher states of consciousness during sleep. (C3–A2) and (C4–A1) show simultaneous theta-alpha waves and delta activity of stage 3 sleep with decreased electromyograph (EMG). The time constant was 0.3 secs with a high filter of 45 Hz (sec, second; μ v, microvolts.)

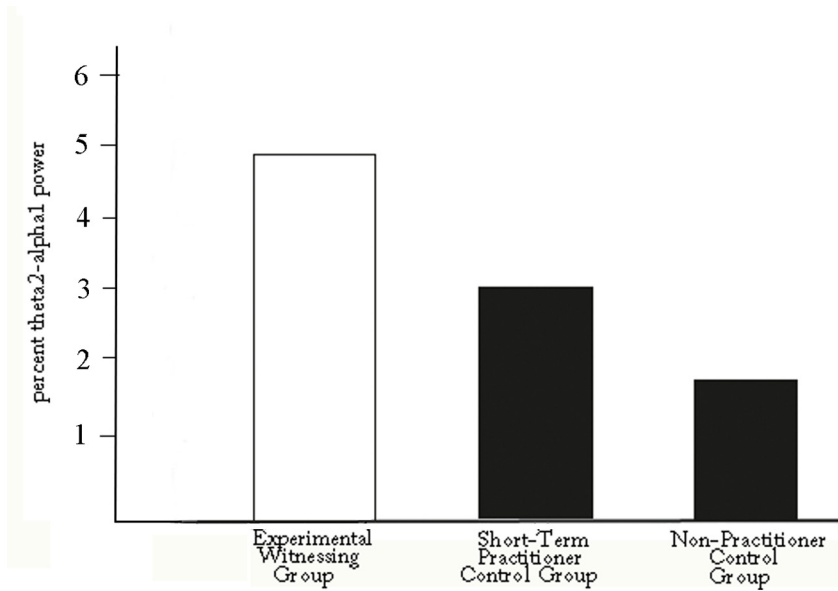


Fig. 2. Comparison of theta2 (6–8 Hz) and alpha1 (8–10 Hz) relative power for the first three cycles of stages 3 and 4 sleep in experimental subjects, short-term practitioners, and non-practitioners. With no significant differences between the groups in time in delta sleep, there was a graded difference in theta2–alpha1 with the experimental subjects greater than the short-term practitioners, who in turn were greater than the non-practitioners [$r(30) = 5.08, p = 0.00002$]. The experimental group had significantly greater theta2–alpha1 than the short-term practitioner controls [$r(19) = 3.70, p = 0.001$] and significantly greater theta2–alpha1 than the non-practitioner controls [$r(21) = 5.81, p = 0.000006$].

Delta spectral analysis results

In absolute delta, there was no significant difference between experimentals and short-term practitioner controls by multivariate analysis of variance (MANOVA) [$F(1,18) = 0.447, p = 0.499$ for stages 3 and 4] for the first three cycles of sleep, where the majority of delta for the night occurs. FFT results were not available in absolute power format for the non-practitioner controls due to the need to conserve computer memory at the Duke University Sleep Lab.

Average theta2-alpha1 relative power

Figure 2 shows greater average theta2-alpha1 relative power in the experimental group for stages 3 and 4 over the first three cycles of sleep as compared to short-term practitioner and non-practitioner control groups.

However, because the witnessing group was significantly older than the control groups, we first examined the degree to which age may have been confounded with years meditating and treatment status. Significant correlations were found between age and years meditating ($r = 0.74$) between age and treatment status ($r = 0.60$) and between treatment status and years meditating ($r = 0.86$). This age confound with length-of-time meditating, and hence with treatment status, led us to perform statistical comparisons in two ways; first, without covarying for age (because of the obvious confound of age with length of time meditating) and second, covarying for age (which is rather conservative given that age is in large part a proxy variable for years meditating and treatment status).

In a global comparison of all three groups (experimental, short-term practitioner, and non-practitioner) the omnibus F was significant for average relative theta2-alpha1 power over the first three cycles of stages 3 and 4 sleep [$F(2,28) = 17.46$, $p = 0.00001$]. The same analysis covarying for age was also significant [$F(2,28) = 6.04$, $p = 0.007$]. Differences between the three treatment groups accounted for 55.5% ($r = 0.75$) of the total variance in theta2-alpha1 power. As expected, the shared variance between age and treatment status was high—39.4% of the variance ($r = 0.63$). Also as anticipated, when covarying for age, the proportion of variance accounted for by treatment status was substantially reduced but still at 16.2% ($r = 0.40$) and was a large effect size. The unique contribution of age was 8.1% or $r = 0.28$.

Main contrasts

The following contrasts are also for the first three cycles of stages 3 and 4 sleep.

1.) The experimental group had significantly greater theta2-alpha1 relative power than the two control groups together [$t(30) = 5.5$, $p = 0.0000008$], including when covarying for age [$t(30) = 2.06$, $p = 0.05$].

2.) There also was a graded effect with the experimental group having greater theta2-alpha1 power than in the short-term practitioners who, in turn, had greater power than the non-practitioners [$t(30) = 5.08$, $p = 0.00002$], including when covarying for age [$t(30) = 3.41$, $p = 0.002$].

Additional contrasts

3.) The experimental group had significantly greater theta2-alpha1 than the non-practitioner controls [$t(21) = 5.81$, $p = 0.0000061$] including when covarying for age [$t(21) = 2.98$, $p = 0.006$].

4.) The experimental group had significantly greater theta2-alpha1 than the short-term practitioner controls [$t(19) = 3.70$, $p = 0.001$], but significance was lost when covarying for age [$t(19) = 0.98$, $p = 0.34$].

5.) The short-term practitioners had a trend for greater theta2-alpha1 than the non-practitioners [$t(19) = 1.82$, $p = 0.08$], and significance was reached after covarying for age [$t(19) = 2.38$, $p = 0.013$].

EMG and REM density

In addition to a pattern of theta-alpha superimposed on delta, the experimental group exhibited significantly more 20-sec epochs with highly reduced EMG during stages 3 and 4 sleep as compared to short-term practitioner controls [$t(18) = 2.8$, $p = 0.011$] (see Fig. 1). When made relative to waking EMG, the significance was even greater [$t(17) = 3.7$, $p = 0.002$]. The experimental group also had greater computer-scored REM density during REM for the first three cycles compared to short-term practitioner controls [MANOVA for repeated measures $F(1, 18) = 4.71$, $p = 0.04$]. EMG and REM density computerized measures were not available in the non-practitioner control group.

Psychological measures

The experimental (witnessing) subjects had significantly higher scores on the States of Consciousness Inventory (30) [$t(14) = 4.7$, $p < 0.0005$] and the M scale (29) [$t(19) = 2.8$, $p = 0.014$] with no significant differences in mental health scores (28) [$t(19) = 1.4$, $p = 0.139$] compared to short-term practitioner controls.

Discussion

In this study, 11 long-term practitioners of the Transcendental Meditation technique reporting the experience of witnessing during sleep showed greater relative power in theta-alpha during stages 3 and 4 delta wave sleep, with no difference in time spent in delta compared to the two control groups. One control group consisted of short-term practitioners and another consisted of non-practitioners of the technique. The witnessing subjects also exhibited significantly more periods of decreased EMG in deep sleep and a significant increase in REM density during REM relative to the short-term practitioner control group. Because each ordinary state of consciousness (waking, deep sleep, and REM sleep) is accompanied by a unique subjective description of experience as well as state specific EEG, EMG, and eye movement patterns (36), a distinctive physiological pattern in subjects reporting witnessing of sleep is interpreted as support for a different state of consciousness. The Vedic tradition describes several "higher" states (3, 6) in which the principal criterion is the subjective experience of witnessing, a situation in which a silent unchanging awareness, also known as Transcendental Consciousness, occurs simultaneously with waking, dreaming, and especially deep sleep. The increased theta-alpha activity found here, coexisting with the delta activity of deep sleep in subjects reporting Transcendental Consciousness during sleep, is interpreted as support for this Vedic description of higher states because increased theta-alpha activity has been reported previously for periods of Transcendental Consciousness during the Transcendental Meditation technique.

For this conclusion to be sound, however, possible explanations based on alternate factors that include 1) age, 2) functional disturbances, 3) arousal, 4) lucid dreaming, and 5) alpha-sleep must be excluded. The evidence and rationale for concluding that these have been successfully excluded is summarized here.

Age

A priority in designing this study was to control for a wide range of self-selection factors by comparing long-term Transcendental Meditation practitioner experimental subjects with short-term Transcendental Meditation practitioner control subjects. Witnessing has been

predicted (4) and found (6) to increase with length of time meditating so the criterion of short-term Transcendental Meditation practice, in addition to that of an absence of witnessing sleep, was applied in selecting the Transcendental Meditation practitioner controls.

Practitioner volunteers who were healthy, older, and also had only recently started to practice the technique were not accessible (see subject section). However, because others have not found either increasing NREM alpha over the age range of 22–64 years (37) or correlations across a wide range of ages between age and NREM theta-alpha power (38), the inability to find control groups that were more closely matched in age to the witnessing practitioner group was not considered a serious limitation.

Given that length of time meditating is held to be a causal factor in developing witnessing (4, 5), it would follow that the experimental group would be comprised of relatively long-term Transcendental Meditation practitioners. Indeed, the average years meditating was 17.8 in the witnessing group compared to only 1.4 for the short-term controls. Therefore it is not surprising that the experimental subjects would be significantly older. In fact, there was a very high intercorrelation between length of time meditating, age, and treatment status.

Therefore age appears to be primarily a proxy variable for length of time meditating. Nevertheless, to be conservative, we covaried for the effect of age. Even though 71% of the total variance accounted for by treatment was shared with age (which was largely due to years meditating), when this shared variance was removed, the effect of treatment status was still statistically significant for the two main contrasts and two of the three additional comparisons. Furthermore, if age was the most parsimonious explanation for the present results we would not have expected the Transcendental Meditation controls (24–36 years) to have more theta-alpha production than the non-practitioner controls (21–36 years) with nearly identical mean ages.

Nevertheless, age did appear to have a smaller independent effect. Future research closely matching witnessing and non-witnessing subjects across a wide range of ages will enable us to directly measure any independent as well as interactive effects of witnessing and age on theta-alpha activity during deep sleep.

Note that the apparent increase of the theta-alpha power even in the short-term practitioners may reflect the gradual infusion of Transcendental Consciousness into sleep associated with the cumulative effect of the practice. Perhaps only when the degree of infusion of Transcendental Consciousness (and corresponding theta-alpha activity) reaches a threshold is it subjectively experienced as witnessing. Future longitudinal research could address this possibility.

Functional disturbances

The subjects were screened for general good health and specifically for disorders including fibrositis, chronic pain, sleep state misperception, parasomnias, and insomnia-type complaints. In addition, no known sleep disorder has been found to exhibit an EEG pattern like the unusual one found in the present study (23–26). Thus, functional disturbance is not indicated as a source of the observed theta-alpha activity in sleep.

Arousal

Arousal is also not indicated as the source of greater theta-alpha relative power in the present study because stage 1 sleep, awakenings, arousals, and movement artifacts were identified as part of the visual scoring process and were excluded in this analysis of only stages 3 and 4 sleep.

Lucid dreaming

One could argue for a possible confusion between subjective reports of lucid dreaming and reports of witnessing during sleep. However, during interviews and in written questionnaires, the present experimental subjects, as well as others (18), were able to distinguish lucid dreaming from witnessing deep sleep and from witnessing dreaming. The findings of a simultaneous theta-alpha and delta EEG pattern occurring during NREM sleep, along with low EMG, support the conclusion that these correlates of Transcendental Consciousness during sleep reflect a proposed higher state distinct from lucid dreaming. Lucid dreaming occurs almost exclusively during phasic REM and more often during later REM periods (20). The physiological changes during slow-wave sleep found in the present study in the witnessing group are not reported in subjects identified primarily as lucid dreamers (17, 20, 21).

Alpha sleep

In addition to the current study, one other researcher (39) has described an increase of theta alpha in delta wave sleep, but the electrophysiological signature in those studies appears different from the one found here. Our pattern of simultaneous theta-alpha and delta was accompanied by periods of decreased EMG during stages 3 and 4 sleep and increased REM density during REM (39, 40, 41). Neither of these was found in the report of alpha sleep (39).

In conclusion, therefore, possible confounds of EEG data due to age, functional disturbances, arousal, lucid dreaming, or alpha sleep are unlikely to provide an acceptable alternative explanation of our results.

EMG and REM density

During waking, periods of momentary heightened alertness are associated with reduced motor activity (42, 43). Also, decreased muscle activity has been reported during a different type of meditation technique than that reported here (44). Heightened orientation or alertness and increased brain activity during REM sleep are also associated with an inability to move or atonia. However our subjects with decreased EMG displayed synchronous alpha-theta and delta unlike the desynchronized EEG of REM possibly indicating a different mechanism underlying the atonia of witnessing sleep.

Autonomic patterns with some similarities to the orienting response have been found during the experience of Transcendental Consciousness during practice of the Transcendental Meditation technique as well (14). Periods of low EMGF also were reported previously in practitioners of the Transcendental Meditation technique at the end of slow-wave sleep periods during night sleep (16). The low EMG seen in the present study during witnessing of deep sleep may thus be related to the orienting response seen during waking and REM (13, 14, 42, 43, 45, 46) and may be a sign of increased inner alertness.

Our findings and previous reports (15) of increased REM density in subjects witnessing sleep could be viewed as an indication of a somewhat lessened sleep depth due to the inner awareness of witnessing (47). REM density also has been found to increase with maturation, increased intelligence, and stage of development (48).

A collection of previously reported psychological [see reviews (3,6)] and multi-dimensional physiological findings (7–16) supports reports of growth of higher states of consciousness. The present results add to these earlier data, providing further support for the existence of higher states of consciousness as described by Maharishi Mahesh Yogi. These higher states of consciousness have been phenomenologically associated with profound changes in experience of the ultimate nature of the Self and its relationship to the world (3–6, 16, 18, 22). These higher states also appear to have practical applications on psychological development (6), physical health (49) and well-being (3, 50).

The present evidence for the existence of higher states of consciousness during sleep also has direct implications for sleep medicine. The potential exists for subjective experiences of higher states during sleep to be misdiagnosed by the uninformed as insomnia or sleep state misperception. However, according to the theoretical model supported by the present results (4, 5) insomnia or ordinary sleep contrasts sharply with witnessing sleep, which is the distinct continuous experience of a state of inner awareness known as “Transcendental Consciousness” during deep sleep.

Acknowledgements: The authors would like to express their deep appreciation to M. Dillbeck, Ph.D. and G. Cavanaugh, M.S. for excellent editorial assistance; to J. Hartwell, Ph.D. and M. Weinless, Ph. D. for superb technical assistance, and to T. Sorflaten, Ph.D., C. P. Cole, M.A.S.C.I., D. Reeks, Ph.D. and T. Egenes, Ph.D. for scholarly illumination of the Vedic literature.

References

1. Maslow AH. *The farther reaches of human nature*. New York: Penguin, 1976.
2. Walsh R, Vaughan F *Paths beyond ego*. New York: Putnam, 1993.
3. Alexander CN, Heaton DP, Chandler HM. Advanced human development in the Vedic psychology of Maharishi Mahesh Yogi: theory and research. In: Miller ME, Cook-Greuter SR, eds. *Transcendence and mature thought in adulthood: the further reaches of adult development*. London: Rowman & Littlefield, 1994:39–70.

4. Maharishi Mahesh Yogi. *On the Bhagavad-Gita: a new translation and commentary*. Harmondsworth, U.K.: Penguin, 1969.
5. Maharishi Mahesh Yogi. *Maharishi Vedic University*. Holland: Maharishi Vedic University Press, 1994.
6. Alexander CN, Davies JL, Dixon CA, et al. Growth of higher stages of consciousness: Maharishi's Vedic psychology of human development. In: Alexander CN, Langer EJ, eds. *Higher stages of human development: perspectives on adult growth*. New York: Oxford Press, 1990:286–341.
7. Badawi K, Wallace RK, Orme-Johnson D, Rouzere AM. Electrophysiological characteristics of respiratory suspension periods occurring during the practice of the Transcendental Meditation program. *Psychosom Med* 1984; 46(3):267–76.
8. Banquet JP, Sailhan M. Quantified EEG spectral analysis of sleep and Transcendental Meditation. *Electroencephal Clin Neurophysiol* 1974; 42:445–53.
9. Farrow JT, Hebert JR. Breath suspension during the Transcendental Meditation technique. *Psychosom Med* 1982;44:135–53.
10. Hebert R, Lehmann D. Theta bursts: an EEG pattern in normal subjects practicing the Transcendental Meditation technique. *Electroencephal Clin Neurophysiol* 1977;42:397–405.
11. Orme-Johnson DW, Haynes CT. EEG phase coherence, pure consciousness, creativity, and Transcendental Meditation-Sidhi experiences. *Intern J Neurosci* 1981;13:211–7.
12. Wallace RK. Physiological effects of Transcendental Meditation. *Science* 1970;167:1751–4.
13. Kesterson J, Clinch NF. Metabolic rate, respiratory exchange ratio, and apneas during meditation. *Am Physiol Soc* 1989;R632–8.
14. Travis F, Wallace K. Autonomic patterns during respiratory suspensions: possible markers of transcendental consciousness. *Psychophysiology*, 1997, 34:39–46.
15. Meirsman, JMR. Neurophysiological order in the REM sleep of participants in the Transcendental Meditation and Transcendental Meditation-Sidhi program. In: Wallace RK, Orme-Johnson DW, Dillbeck MC, eds. *Scientific research on the Transcendental Meditation and Transcendental Meditation-Sidhi program: collected papers. vol. 5*. Fairfield, IA: MIU Press, 1990:3033–4.

16. Travis FT. The junction point: a field model of waking, sleeping and dreaming, relating dream witnessing, the waking, sleeping, transition, and Transcendental Meditation in terms of a common psychophysiological state. *Dreaming* 1994; 4:91–104.
17. LaBerge, S. *Lucid dreaming*. Los Angeles: JP Tarcher, 1985.
18. Alexander CN. A conceptual and phenomenological analysis of pure consciousness during sleep. *Lucidity Lett* 1988; 7:39–45.
19. Gackenbach JI, Moorecroft W, Alexander C, LaBerge S. Physiological correlates of “consciousness” during sleep in a single Transcendental Meditation practitioner. *Sleep Res* 1997; 16:230.
20. LaBerge SP, Levitan L, Demerit WC. Lucid dreaming: physiological correlates of consciousness during REM sleep. *J Mind Behav* 1986;7(2–3S):251–8.
21. Brylowski A, Levitan L, LaBerge S. H-Reflex suppression and autonomic activation during lucid REM sleep: a case study. *Sleep* 1989;12:374–8.
22. Gackenbach J. A developmental model of consciousness in sleep: from sleep consciousness to pure consciousness. In: Gackenbach J, Sheikh AA, eds. *Dream images: a call to mental arms*. New York: Baywood, 1991:87–308.
23. Horne JA, Shackell BS. Alpha-like EEG activity in non-REM sleep and the fibromyalgia (fibrositis) syndrome. *Electroencephal Clin Neurophysiol* 1991;79:271–6.
24. Moldofsky H, Scarisbrick P, England R, Smythe H. M skeletal symptoms and non-REM sleep disturbance in patients with “fibrositis syndrome” and healthy subjects. *Psychosom Med* 1975;37:341–51.
25. McCall WV, Edinger JD. Subjective total insomnia: an example of sleep state misperception. *Sleep* 1992;15:71–3.
26. Thorpy MJ, Glovinsky PB. Parasomnias. *Psychiat Clin N Am* 1987;10:623–39.
27. Sewitch DE. The perceptual uncertainty of having slept: the inability to discriminate electroencephalographic sleep from wakefulness. *Psychophysiology* 1984;21:243–59.
28. Goldberg D, Hillier VF. A scaled version of the General Health Questionnaire. *Psychol Med* 1979;9:139–45.

29. Hood RW Jr. The construction and preliminary validation measure of reported mystical experience. *J Sci Study Rel* 1975;14:29–41.
30. Cranson R. Intelligence and the growth of intelligence in Maharishi's Vedic psychology and twentieth century psychology *Diss Abs Internl* 1989;51:9–07332.
31. Leigh TJ, Bird HA, Hindmarch I, Constable PDL, Wright V. Factor analysis of the St. Mary's Hospital sleep questionnaire. *Sleep* 1988; 11:448–53.
32. Lee KA, Shaver JF, Giblin EC, Woods NF. Sleep patterns related to menstrual cycle phase and premenstrual affective symptoms. *Sleep* 1990; 13:403–9.
33. Sharpley AJ, Solomon RA, Cowen PJ. Evaluation of first night effect using ambulatory monitoring and automatic sleep stage analysis. *Sleep* 1988; 11:273–6.
34. Feinberg I, Floyd TC. Systematic trends across the night in human sleep cycles. *Psychophysiology* 1979; 16:283–91.
35. Brunner DP, Dijk DJ, Borbely AA. A quantitative analysis phasic and tonic submental EMG activity in human sleep. *Physiological Behav* 1990;48:741–8.
36. Niedermeyer E, Lopes da Silva R *Electroencephalography: basic principles, clinical applications and related fields*. Baltimore: Urban & Schwarzenberg, 1987.
37. Feinberg I. Changes in sleep cycle patterns with age. *J Psych Res* 1974;10:283–306.
38. Keane B, Smith J, Webb W. The temporal distribution and ontogenetic development of EEG activity during sleep. *Psychophysiology* 1977;14:315–21.
39. Scheuler W, Kubicki ST, Marquardt J, et al. The alpha-sleep pattern—quantitative analysis and functional aspects. In: Koella WP, Obal F, Schulz H, Visser P, eds. *Sleep '86*. New York: Gustav Fisher Verlag, 1988:284–6.
40. Scheuler W, Rappelsberger P, Schmatz F. Periodicities of the alpha-sleep pattern. *Sleep Res* 1987;16:638.
41. Scheuler W, Haag C, Kubicki, ST. Phasic events during sleep in subjects with alpha-sleep pattern. *Brain Res* 1987;16:425.
42. Chase MH, Morales FR. The atonia and myoclonia of active (REM) sleep. *Am Rev Psychol* 1990; 41:557–84.

43. Morrison AR. Paradoxical sleep and alert wakefulness: variations on a theme. In: Chase M, ed. *Sleep disorders: basic and clinical research*. New York: Spectrum Publications, 1983:95, 121.
44. Das NN, Gestate H: Variations de l'activite electrique du cerveau, du coeur et de muscles squelettiques au cours del la meditation et de l'extase yogique. *Electroencephal Clin Neurophysiol* 1957; S6:211-9.
45. Arenander AT. Brain state and attentional mechanisms in the transition to a de-excited state of consciousness. A neuropsychological model of transcending. *Soc Neurosci Abs* 1986; 12:1446.
46. Hunt H. cognitive psychology of mystical and altered state experience. *Perceptual Motor Skills* 1984:58: 467-513.
47. Feinberg I, Floyd T, March JD. Effects of sleep loss on delta (0.3-3 Hz) EEG and eye movement density: new observations and hypotheses. *Electroencephal Clin Neurophysiol* 1987;67: 217-21.
48. Petre-Quadens O, DeLee C, Remy M. Eye movement density during sleep and brain maturation. *Brain Res* 1971:49-56.
49. Nader, T. *Human Physiology: Expression of Veda and the Vedic Literature*. Vlodrop, Netherlands: Maharishi Vedic University, 1995.
50. Gelderloos P, Hermans HJM, Ahlstrom HH, Jacoby R. Transcendence and psychological health: studies with long-term participants of the Transcendental Meditation and Transcendental Meditation-Sidhi program. *J Psychology* 1990;124:177-97.

This article, "Electrophysiological Correlates of Higher States of Consciousness During Sleep in Long-Term Practitioners of Transcendental Meditation Program," by L.I. Mason, C.N. Alexander, F.T. Travis, D.W. Orme-Johnson, M. Rainforth, K.G. Walton, G. Marsh, J. Gakenbach, and D.C. Mason, here revised/updated, and reprinted with permission, was originally published in *Sleep* 20(2), 102-110.

**Patterns of EEG Coherence, Power, and
Contingent Negative Variation
Characterize the Integration
of Transcendental and Waking States**

■

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ABSTRACT

Long-term meditating subjects report that transcendental experiences (TE), which first occurred during their Transcendental Meditation (Transcendental Meditation) practice, now subjectively coexist with waking and sleeping states. To investigate neurophysiological correlates of this integrated state, we recorded EEG in these subjects and in two comparison groups during simple and choice contingent negative variation (CNV) tasks. In individuals reporting the integration of the transcendent with waking and sleeping, CNV was higher in simple but lower in choice trials, and 6–12 Hz EEG amplitude and broadband frontal EEG coherence were higher during choice trials. Increased EEG amplitude and coherence, characteristic of Transcendental Meditation practice, appeared to become a stable EEG trait during CNV tasks in these subjects. These significant EEG differences may underlie the inverse patterns in CNV amplitude seen between groups. An 'Integration Scale,' constructed from these cortical measures, may characterize the transformation in brain dynamics corresponding to increasing integration of the transcendent with waking and sleeping.

Keywords: CNV; Meditation; EEG; Coherence; Transcendental Meditation; Enlightenment; Transcendental experiences

1. Introduction

In Western cultures, transcendental experiences (TE) are generally considered either momentary, ephemeral (James, 1961; Maslow, 1972), or as epiphenomena of limited importance (Persinger, 1984, 1993). Eastern traditions, however, include meditation practices that elicit frequent TE with the purpose of enhancing human development (Maharishi Mahesh Yogi, 1967; Travis et al., 2000; Walsh, 1982).

Various physiological markers have been reported during TE in subjects practicing different meditation techniques. For instance, during practice of Tibetan Buddhism, experiences characterized by the 'loss of the usual sense of space and time' were associated with increased frontal regional cerebral blood flow (rCBF), and significant correlation between left dorsolateral frontal rCBF increases and left parietal rCBF decreases (Newberg et al., 2001). During practice of Diamond Way Buddhism, experiences of the 'dissolution of the self into a boundless emptiness' were associated with right fronto-temporal 40-Hz ampli-

tude increases (Lehmann et al., 2001). During Transcendental Meditation practice, experiences of 'unboundedness' and the 'loss of time, space and body sense' (Travis and Pearson, 2000) were associated with spontaneous breath quiescence (breath periods from 10 to 40 secs) (Badawi et al., 1984; Farrow and Hebert, 1982), with autonomic orienting at the onset of breath changes (Travis and Wallace, 1997). These breath changes occurred on the background of high EEG coherence, which rises to high levels in the first min of Transcendental Meditation practice (Travis and Wallace, 1999).

These reports indicate a growing body of physiological research investigating experiences marked by the absence of time, space and body sense during meditation practice. Time and space are the framework for organizing waking experiences into coherent perceptual wholes, and body sense helps provide the boundary between inner and outer phenomena. This framework, which gives structure to waking experiences, appears to be absent during TE. Thus, subjectively and physiologically, TE appears to be fundamentally different than waking experiences.

Eastern traditions encourage TE for the larger purpose of culturing a new style of mental and physiological functioning in which the transcendental state is integrated along with waking and sleeping states (Maharishi Mahesh Yogi, 1963; Mason et al., 1997; Shearer and Russell, 1978). The current study investigated Transcendental Meditation subjects reporting this integrated experience. Transcendental Meditation subjects were tested because: (1) a body of physiological research exists that delineates different substates during Transcendental Meditation practice to help guide this research (Farrow and Hebert, 1982; Travis, 2001; Travis and Wallace, 1997); and (2) many Transcendental Meditation subjects are available who report the continuous integration of the transcendent with waking and sleeping states for one year or longer.

An individual who practices the Transcendental Meditation technique describes this integrated experience in this way.

The flurry of waking activity comes and goes; the inertia of sleep comes and goes. Yet, throughout these changing values of waking and sleeping, there is a silent, unbounded continuum of awareness that is me; I am never lost to myself.

This description of the coexistence of two qualitatively different states, a silent continuum of inner awareness along with the 'flurry' of daily activity, is consistent with EEG patterns of subjects reporting this integrated experience. For example, when these subjects are asleep, higher alpha EEG amplitude, which is indicative of wakefulness, is observed during stage three and four delta sleep (Banquet and Sailhan, 1974; Mason et al., 1997). Also, during eyes-open resting, increased alpha EEG coherence is seen in subjects reporting more frequent TE compared with subjects reporting less frequent experiences (Travis, 1991). Thus, self reports of integration of the transcendent with waking and sleeping states correlate with objective reports of the integration of EEG patterns normally seen during TE in meditation [high frontal alpha EEG power and coherence (Travis, 2001; Wallace, 1970)] with those seen during waking (low voltage, mixed frequency) and sleeping (delta activity).

Contingent negative variation (CNV) also appears to be sensitive to frequency of TE. CNV is an event-related potential occurring between a warning stimulus (S1) and a second imperative stimulus (S2) requiring a response (Walter et al., 1964). Early CNV, measured in the 500–800 ms window after S1, reflects automatic, orienting processes (Tecce, 1972; Tecce and Cattanach, 1993). Late CNV, measured in the 200 ms window before S2, reflects proactive preparatory processes, including mobilization of motor (Brunia and Damen, 1988; van Boxtel and Brunia, 1994), perceptual, cognitive, and attentional resources (Tecce and Cattanach, 1993).

With more frequent TE, late CNV in a simple RT paradigm was reported to increase and distraction effects were reported to decrease (Travis et al., 2000). In contrast, CNV in a choice RT task was reported to be lower in subjects reporting more frequent TE (Travis et al., in press). The authors suggested that lower CNV in the choice trials may reflect a more balanced attentional set in which subjects waited for S2 before they initiated response processes. Early CNV was not sensitive to group membership in either of these two studies.

The current study extended earlier reports of the relation between brain functioning and frequency of TE by: (1) testing subjects with more extensive Transcendental Meditation practice (24 vs. 7 years Transcendental Meditation practice), who report the continuous integration of

the transcendent with waking and sleeping states; (2) comparing EEG amplitude and coherence during tasks; and (3) presenting subjects both simple and choice CNV tasks. EEG coherence and late CNV were measured in this study, since they were sensitive to frequency of TE in the studies reported above. We hypothesized that subjects reporting more frequent TE would display higher frontal EEG amplitude and coherence, higher late CNV amplitudes in a simple CNV task, and lower late CNV amplitudes in a choice task.

2. Methods

2.1. Subjects

Fifty-one subjects participated in the study—none had participated in previous research. Subjects were assigned to groups based on self-reported frequency of TE. Subjects reporting rare if any TE formed the Rare-TE group (B once per year, age = 39.79 ± 11.5 years).¹ This group was recruited from individuals who intended to learn the Transcendental Meditation technique, but had not yet been instructed. Subjects reporting frequent TE during meditation practice, but only occasionally during waking and sleeping, formed the Occas-TE group (one to ten times per year, age = 42.59 ± 11.5 years, Transcendental Meditation practice = 7.89 ± 3.0 years). Subjects reporting the continuous coexistence of the transcendent with waking and sleeping states formed the Cont-TE group (age = 46.59 ± 7.0 years, Transcendental Meditation practice = 24.59 ± 1.2 years). The age differences between groups were not statistically significant, $F(2, 48) = 1.90, p = 0.160$. Each group comprised eight females and nine males.

A semi-structured interview and two measures of TE were used to substantiate subjects' self-reports of inner experiences. The two scales were Hood's M-Scale (Hood, 1975), and Baruss's Physical-Transcendent Scale (Baruss and Moore, 1992). Hood's M-Scale contains 32 brief descriptions of a number of TE with a five-point Likert response-scale ranging from 'Definitely Agree' to 'Definitely Disagree.' Baruss's Physical-Transcendent Scale contains 38 statements that lie along a physical-transcendent dimension with a seven-point Likert response-scale. Baruss constructed this scale to quantify a subject's worldview.

¹ Data are reported as mean/standard deviation

The subjects were blind to the specific experimental hypotheses. All subjects were right-handed. Subjects had no history of accidents, hospitalization, or psychiatric diseases that might have affected their EEG. They were also free of prescription or non-prescription drugs that might affect EEG records. Informed consent was obtained before the testing, and the University Institutional Review Board approved the experimental protocol.

2.2. Recording details

EEG was recorded from F3, FZ, F4, C3, CZ, C4, P3, PZ, and P4 in the 10–20 system, using Ag/AgCl electrodes affixed with EC-2 cream, with a forehead ground and impedances at 5 kohms or less. Vertical electrooculogram (EOG) was recorded with electrodes placed above and below the right eye to use in the eye-movement correction procedure. Heart rate was recorded with a Lead II configuration (Stern et al., 1976). A linked-ears reference was used (Picton and Hillyard, 1972).

EEG and EOG signals were recorded with a 0.01–100 Hz band pass filter (three down, 12 dB octave/slope). Heart rate was recorded with a 3.0–100 Hz band pass filter. All signals were digitized online at 200 points per sec, and stored for later analyses using EEGSYS, a standardized research acquisition and analysis package developed in conjunction with researchers at the National Institutes of Health (Hartwell, 1995).

2.3. Procedure

Subjects were tested from 15:00 to 17:00 h, which was 6–8 h after the Transcendental Meditation subjects' morning meditation, and just before their afternoon meditation session. Thus, any performance differences between groups should primarily reflect long-term Transcendental Meditation effects rather than immediate Transcendental Meditation effects. Subjects completed the M-Scale and the Physical-Transcendent Scale while the sensors were being applied.

Subjects were then visually presented a set sequence of four CNV tasks with 31 trials in each task. Each block of trials lasted approximately 7 min. Inter-trial intervals varied from 8 to 14 sec. (1) The first task contained 31 simple trials. In these trials, S1 was an asterisk (150 ms duration, 1 cm in height) in the center of a computer screen, followed 1.5 secs later by S2, a continuous computer-generated tone (1200

Hz, 72 dB). Subjects were asked to stop the tone as quickly as possible with a key press. (2) The second task contained both simple RT trials and simple trials with a divided-attention task in the S_1S_2 interval. These trials consisted of random presentation of 16 simple trials, as in the first task, and 15 divided-attention trials with three letters visually presented in the S_1S_2 interval. Subjects were asked to speak out the letters after terminating S_2 with a key press. (3) The third task contained choice trials. In these trials, S_1 was a one or two-digit number (150 ms duration, 1 cm in height) in the center of the computer screen, followed 1.5 secs later by S_2 , another one or two-digit number. Subjects were asked to press a button in their left hand if the first number was larger, or in their right hand if the second number was larger. (4) The last task randomly presented choice RT trials and choice RT with divided attention trials, similar to the second block of trials.

Data were recorded for 6 sec, beginning 100 ms pre- S_1 , and ending 4.4 secs after S_2 . According to a recent methodology paper (Picton et al., 2000), 100 ms is an acceptable baseline. Following the CNV trials, EEG was recorded during a 15-min eyes-closed rest period for the Rare-TE (non-meditating) subjects and during a 15-min Transcendental Meditation session for the Occas-TE and the Cont-TE subjects. The purpose of this was: (1) to compare Transcendental Meditation practice EEG patterns between the two Transcendental Meditation groups to discern possible practice effects in short- and very long-term Transcendental Meditation subjects; and (2) to detect cortical patterns seen during Transcendental Meditation practice but not during eyes-closed rest. This comparison was not used for hypothesis testing, but to help guide investigation of EEG patterns that may distinguish the integration of the transcendent with waking and sleeping states in these subjects.

After the physiological recordings, subjects were interviewed using a semi-structured interview format. Subjects were asked three questions: What were your experiences during the computer tasks? What are your experiences during sleep? Please describe yourself. The interview format was flexible enough to probe experiences and issues important to each subject, as well as ask standard questions. The interview data helped to further support subject's self-reports of TE and provided detailed descriptions of the subject's inner experiences. These interview data will be presented elsewhere.

2.4. Data analysis

2.4.1. Late CNV amplitude

The subjects were asked to focus on the center of the screen during each trial, and to rest their eyes after responding to S2. This resulted in very few eye blinks in the first 2 secs (containing the baseline period, S1, S2, and response selection periods), but frequent eye blinks toward the end of the 6 sec recording window. To eliminate the majority of eye blinks from the CNV analysis, the first 2 secs of data from the 6 sec recording windows were used for subsequent data analysis. These 2 sec windows were corrected for effects of partial saccades (B 50 mV) with the eye-movement correction procedure proposed by Gratton et al. (1983, 1983) and more generally implemented by Miller et al. (1988).

The partial-saccade-corrected trials were then read back into EEG-SYS and any trial with artifacts—flat EEG or blinks (excursions $> 50 \mu\text{V}$)—were manually marked and eliminated from the average. Before averaging, the data were passed through a 3 Hz low pass filter to remove the effects of theta and alpha activity on the averaged waveforms. CNV trials were averaged within the four tasks. During the simple and choice trials, there were 20 or more artifact-free trials for each subject. During the divided-attention trials, a third of the subjects had fewer than six artifact-free trials (out of a possible 15 trials). With so few artifact-free trials, the divided attention trials were not analyzed further. CNV presented below are from the first and third blocks—simple and choice trials only.

Late CNV was measured during the simple and choice trials in microvolts as the average amplitude in the 200 ms window before S2, relative to the 100 ms baseline. Simple-choice difference-scores were calculated ($\text{CNV}_{\text{simple}} - \text{CNV}_{\text{choice}}$) to assess the impact of the additional cognitive load of the choice trials independent of possible group differences in the simple trials.

2.4.2. EEG spectral analysis

The data were visually scanned and any epochs with movement, electrode or eye-movement artifacts were manually marked and not included in the spectral analysis. The artifact-free data were fast Fourier transformed in 2-sec epochs during the first 2 mins of the rest/

Transcendental Meditation sessions and for the 31 2-sec epochs in the choice trials. Amplitude² was calculated for the nine electrodes measured. Coherence was calculated for nine coherence pairs: F3-F4, C3-C4, P3-P4, F3-C3, FZ-CZ, F4-C4, F3-P3, FZ-PZ, and F4-P4.

Spectral analysis was calculated for the first 2 mins of the Transcendental Meditation session because the first 2 mins are reported to be representative of the entire session (Travis and Wallace, 1999). Spectral analysis was calculated for the choice trials rather than the simple trials, because the choice trials contain more cognitive processes than the simple trials and, therefore, may better distinguish possible effects of the integration of transcendental and waking states. Spectral analysis was calculated for the full 2 secs of the choice trials to probe general cortical functioning across memory, categorization and response selection processes. While shorter epochs (300 ms) might reveal the relation between, for example, early or late CNV amplitude and spectral estimates, our intent was to characterize background brain states rather than specific components of processing. In addition, longer epochs yield more stable coherence estimates (Mocks and Gasser, 1984).

Spectral estimates were grouped into three frequency bins: 6–12, 12–25, and 25–45 Hz. These three bins resulted from a Principal Components Analysis of coherence estimates in 1 Hz bands during Transcendental Meditation practice in another meditating cohort (Travis et al., in press). These three bins were used in this study to simplify data analyses.

2.4.3. Reaction time, accuracy, heart rate and eye-blink rate

Response time to S2 was measured to the nearest ms in the simple and choice trials and stored for later analysis. The stimulus/responses codes were also stored for later analysis of accuracy rates. Heart rate and eye blinks were each summed in the 31 6-sec epochs during the choice trials. This sum was divided by 3.1 to yield rate per min (186 total s/60 secs per min ÷ 3.1).

² EEGSYS calculates power values in each epoch and then estimates the amplitude of a sine wave throughout the epoch that would yield those power values in the Hartwell, J. (1995). EEGSYS User's Guide. Baltimore, MD: Friends Medical Science Research Center, Inc. These amplitude values are presented here.

2.5. *Statistical analysis*

An omnibus MANCOVA was first performed to test for main effects and interaction effects with one between factor (group), two within factors (tasks and electrodes), one covariate (age) and CNV as the variate. Age was entered in the MANCOVA to test whether the 7-year age difference between groups, which was not statistically significant, might still differentially affect the results. Since significant task \times group and electrode \times group interactions were found, individual MANOVAs were performed to test for main effects and interaction effects during each CNV task, and for coherence and power during tasks. An alpha level of 0.05 was used for multivariate analyses; an alpha level of 0.015 for multiple comparisons with three variables; and an alpha level of 0.007 for multiple comparisons with nine variables—all reflecting Bonferroni corrections.

All variables that significantly differed between groups in the MANOVAs were entered into a Principal Components Analysis to reduce the significant variables identified in the MANOVAs to a smaller number of factors that retained most of the original information in the data. (This is discussed in detail below.) The resulting factor scores were entered into a stepwise regression with group as the criterion variable and the composite measures as the predictor variables. The stepwise regression identified the fewest cortical factors necessary to discriminate groups.

3. Results

3.1. *Outcome of pencil-and-paper tests of transcendent experience*

The scores on the M-Scale and the Physical-Transcendent Scale were highly correlated [$r(50) = 0.801$, $p < 0.0005$], suggesting that these instruments measure a similar construct. A MANOVA with group as the between factor and scores on these two tests as variates yielded a significant main effect for group [$F(2, 100) = 10.72$; $p < 0.0005$]. Multiple comparisons using the 'Least Significant Difference' test revealed that these two experience variables distinguished the three groups. All paired comparisons were significant at the $p < 0.001$ level. Group means for M-Scale were: Rare-TE = 18.1 ± 6.47 ; Occas-TE = 39.5 ± 3.15 ; Cont-TE = 60.7 ± 0.61 . Group means for the Physical-Tran-

scendent Scale were: Rare-TE = 35.7 ± 5.21 ; Occas-TE = 61.4 ± 4.71 ; Cont-TE = 84.1 ± 2.96 .

3.2. Descriptive statistics of CNV, EEG coherence and EEG amplitude patterns during tasks

3.2.1. CNV

Fig. 1 presents simple (solid lines) and choice (dotted lines) averaged waveforms in microvolts. EOG (top row) was flat in both tasks for all groups. The gray columns before S2 show the 200-ms period used to calculate late CNV. Simple CNV was lowest in the Rare-TE group (left column) and highest in the Cont-TE group (right column) at frontal, central and parietal midline electrodes (rows). In contrast, choice CNV exhibited the opposite pattern—highest in the Rare-TE group and lowest in the Cont-TE group, with the Occas-TE group again in the middle.³

3.2.2. EEG coherence

The group means for EEG coherence in the three frequency bins during the rest/Transcendental Meditation session and the choice CNV task are presented in Table 1. Consistent group differences in both conditions are seen in F3F4 coherence, across all three frequency bins. Coherence estimates for other electrode pairs were similar across groups.

3.2.3. EEG amplitude

Fig. 2 presents the group means and standard errors for the Rare-TE group (solid), Occas-TE group (diagonal lines) and Cont-TE group (open) at frontal, central and parietal electrodes in the 6–12, 12–25, and 25–45 Hz frequency bins. Consistently higher 6–12 Hz amplitudes are seen in the Cont-TE amplitude group at frontal, central and parietal electrodes.

³ The P300 component following S1 also appears to have an inverse pattern across groups. While a MANOVA revealed significant group-task interactions, individual MANOVAs within task yielded no significant main effects for group. Future research can investigate the relation of P300 and CNV in these subjects.

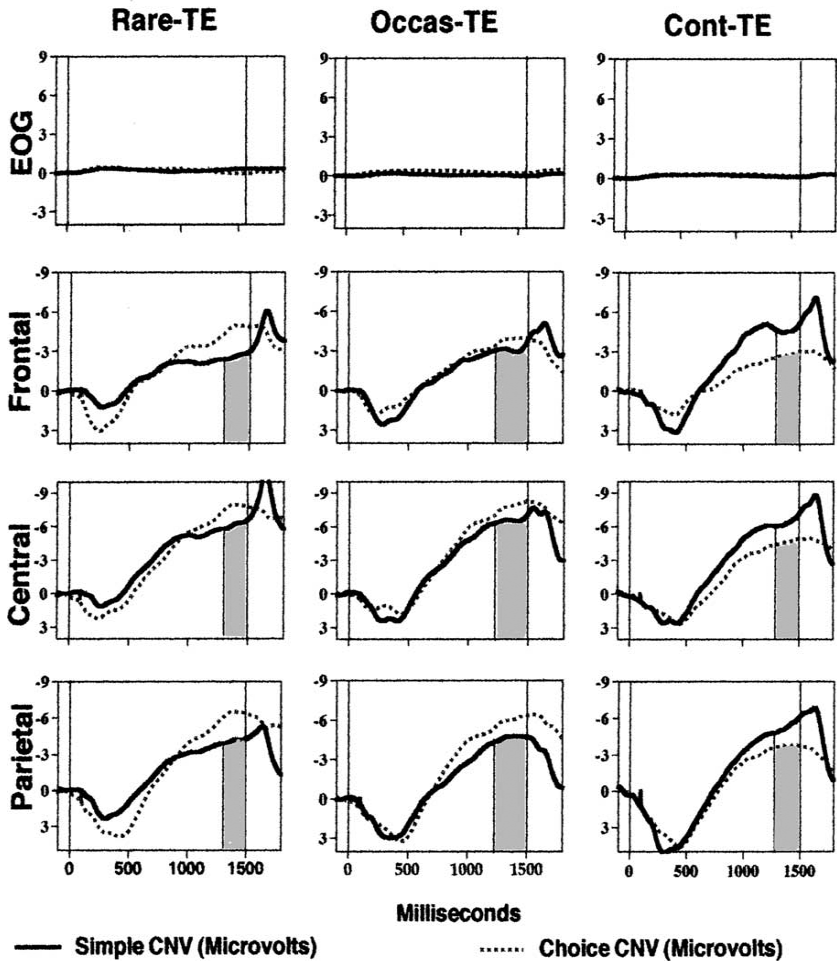


Fig. 1. CNV group averages at EOG, frontal, central and parietal midline electrodes. The vertical lines near the left side of each graph indicate the onset of S1 (an asterisk in simple trials and a one- or two-digit number in choice trials). The line near the right side of each graph indicates the onset of S2 (a tone in simple trials and a sound one- or two-digit number in choice trials). The gray column to the left of S2 represents the 200-ms period used to calculate late CNV. Note that CNV amplitudes are highest in the simple trials (solid lines) and lowest in the choice trials (dotted lines) for the group reporting continuous TE (Cont-TE) relative to the subjects reporting occasional (Occas-TE) or rare TE (Rare-TE).

3.3. Inferential statistic

A mixed MANCOVA was performed with one between factor (group), two within factors (tasks and electrodes), one covariate (age) and CNV as the variate. This analysis revealed significant task x group interactions [$F(2, 48) = 4.87, p = 0.012$] and electrode x group interactions [$F(16, 376) = 2.33, p = 0.003$]. Age was not a significant covariate, $F(1, 49) = 1.15, p = 0.28$). Thus, age was not included in further analyses. Since the group x task interactions were highly significant, individual MANOVAs were performed to test group differences within each task individually. Fig. 3 presents the mean simple and choice CNV amplitudes, collapsed across electrode site, for the three groups of subjects. The group x task interaction is clearly seen in the figure.

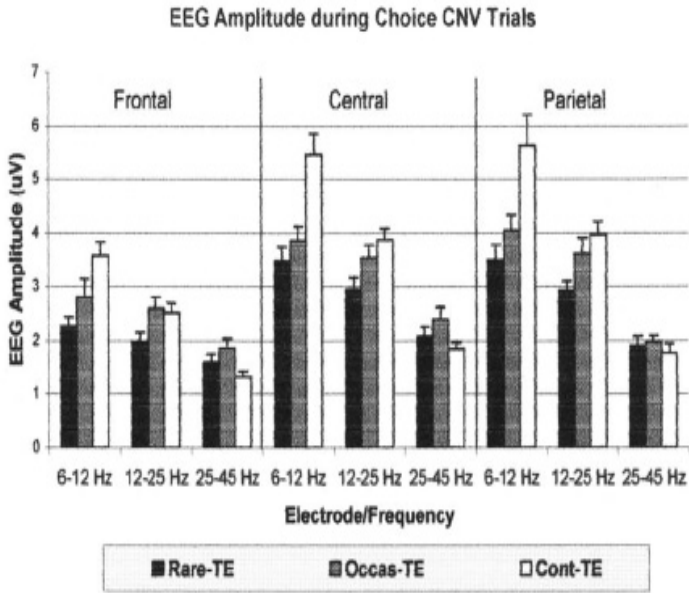


Fig. 2. EEG amplitude at frontal, central and parietal leads during the choice CNV trials. Means and standard errors are presented for the Rare-TE group (solid), Occas-TE group (diagonal lines) and Cont-TE group (open) at frontal, central and parietal electrodes in the 6–12, 12–25, and 25–45 Hz frequency bands.

Table 1.
Mean EEG Coherence in 3 frequency bands for the 3 experimental groups during the Rest/Transcendental Meditation session and the choice CNV task

	Coh pair (Hz)					
	Rest/Transcendental Meditation			Choice Task		
	Rare-TE	Occas-TE	Cont-TE	Rare-TE	Occas-TE	Cont-TE
F3-F4						
6-12	0.564	0.718	0.719	0.331	0.441	0.482
12-25	0.284	0.489	0.527	0.169	0.264	0.347
35-45	0.150	0.349	0.442	0.155	0.209	0.301
F3-C3						
6-12	0.515	0.645	0.551	0.398	0.529	0.469
12-25	0.352	0.549	0.433	0.275	0.365	0.339
35-45	0.285	0.441	0.386	0.266	0.315	0.326
FZ-CZ						
6-12	0.719	0.764	0.750	0.586	0.683	0.649
12-25	0.655	0.733	0.720	0.571	0.657	0.618
35-45	0.582	0.665	0.643	0.568	0.638	0.595
F4-C4						
6-12	0.574	0.616	0.553	0.539	0.503	0.467
12-25	0.395	0.515	0.464	0.371	0.310	0.328
35-45	0.318	0.414	0.384	0.374	0.264	0.296
F3-P3						
6-12	0.176	0.231	0.135	0.131	0.195	0.098
12-25	0.084	0.194	0.104	0.088	0.138	0.076
35-45	0.144	0.194	0.156	0.154	0.175	0.169
FZ-PZ						
6-12	0.312	0.316	0.253	0.287	0.329	0.249
12-25	0.229	0.308	0.251	0.239	0.295	0.216
35-45	0.322	0.328	0.298	0.368	0.391	0.333
F4-P4						
6-12	0.204	0.238	0.127	0.210	0.201	0.141
12-25	0.109	0.186	0.123	0.138	0.122	0.106
35-45	0.161	0.192	0.174	0.208	0.143	0.195
C3-C4						
6-12	0.496	0.479	0.478	0.522	0.596	0.509
12-25	0.360	0.299	0.297	0.401	0.321	0.351
35-45	0.352	0.287	0.328	0.293	0.362	0.276
P3-P4						
6-12	0.564	0.504	0.506	0.541	0.566	0.524
12-25	0.448	0.381	0.373	0.403	0.391	0.349
35-45	0.464	0.420	0.463	0.429	0.472	0.437

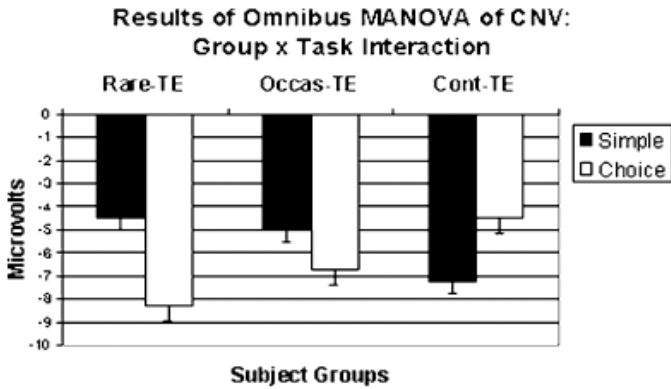


Fig. 3. Group-task interaction effects on CNV amplitude from the MANOVA. This figure presents the means for simple and choice CNV amplitude collapsing across electrode site. The group-task interaction is seen in this figure as a clear inverse pattern of CNV amplitudes during the tasks across the groups.

3.3.1. MANOVA of simple CNV

A MANOVA was performed with group as the between factor and simple CNV from the nine measured electrodes as the variates. This analysis revealed significant main effects for group [multivariate $F(9, 41) = 2.56, p = 0.019$]. This overall significance resulted from main effects for group at F3, FZ, F4, and C3 electrodes only [F3: $F(2, 48) = 5.60, p = 0.007$; FZ: $F(2, 48) = 7.21, p = 0.002$; F4: $F(2, 48) = 7.00, p = 0.002$; C3: $F(2, 48) = 4.67, p = 0.014$]. Multiple comparisons (Least Significant Difference) revealed significantly higher simple CNV in the Cont-TE subjects compared with the Rare-TE subjects at frontal and C3 electrodes [F3: $t(33) = -3.32, p = 0.002$; FZ: $t(33) = -3.28, p = 0.002$; F4: $t(33) = -3.36, p = 0.002$; C3: $t(33) = -2.80, p = 0.008$] and compared with the Occas-TE subjects at FZ, F4, and C3 [$t(33) = -3.33, p = 0.002$; $t(33) = -3.14, p = 0.003$; $t(33) = -2.53, p = 0.015$, respectively]. Differences between the Occas-TE and Rare-TE groups were not statistically significant.

3.3.2. MANOVA of simple-choice CNV difference scores

Table 2 contains the means and standard deviations (S.D.) for simple-choice CNV difference scores at each of the nine electrodes. These dif-

ference scores reflected the impact of the increased cognitive load of the choice task, independent of the significant group differences on the simple task. Since CNV is a negative potential, a positive simple-choice CNV difference score indicates that CNV during the choice trials was greater than during the simple trials. For instance,

$$(-7 \mu V)_{\text{simple trials}} - (-10 \mu V)_{\text{choice trials}} = +3 \mu V_{\text{difference score}}$$

In Table 2, notice the pattern of more positive difference scores (higher CNV during choice trials) in the Rare-TE subjects compared with Cont-TE subjects.

A MANOVA was performed with group as the between factor and simple-choice difference scores at the nine electrodes as variates. This analysis revealed significant main effects for group [multivariate $F(9, 41) = 3.0$, $p = 0.008$]. This overall significance reflected significant main effects for groups at all nine electrodes. The ANOVA table is presented in Table 3. Multiple comparisons revealed significantly lower simple-choice difference scores in the Cont-TE subjects compared with the Rare-TE subjects at all electrodes [F3: $t(33) = -3.19$, $p = 0.003$; Fz: $t(33) = -4.29$, $p < 0.0001$; F4: $t(33) = -3.77$, $p < 0.001$; C3: $t(33) = -4.58$, $p < 0.0001$; Cz: $t(33) = -3.61$, $p = 0.001$; C4: $t(33) = -4.19$, $p < 0.0001$; P3: $t(33) = -3.84$, $p < 0.001$; Pz: $t(33) = -3.27$, $p = 0.002$; P4: $t(33) = -3.73$, $p < 0.001$] and Cont-TE subjects compared with the Occas-TE subjects at frontal and central electrodes [F3: $t(33) = -3.24$, $p = 0.002$; Fz: $t(33) = -2.98$, $p = 0.004$; F4: $t(33) = -3.48$, $p = 0.001$; C3: $t(33) = -2.97$, $p = 0.005$; Cz: $t(33) = -2.83$, $p = 0.007$; C4: $t(33) = -2.87$, $p = 0.006$]. There were no significant differences between the Rare-TE and Occas-TE subjects.

3.3.3. Reaction time, accuracy, heart rate and blink rate during CNV trials

There were no significant main effects for group in reaction time, accuracy, heart rate, or blink rate for the simple trials or the choice trials (all $FB \ 1.0$). The means and S.D. for these variables are presented in Table 4.

Table 2. Simple-choice difference scores: means (S.D.)

Electrode	Group	Mean
F3	Rare-TE	1.74 (2.43)
	Occas-TE	2.25 (5.21)
	Cont-TE	-2.54 (3.26)
FZ	Rare-TE	2.35 (3.00)
	Occas-TE	0.61 (2.33)
	Cont-TE	-2.06 (3.53)
F4	Rare-TE	1.52 (2.60)
	Occas-TE	0.94 (1.80)
	Cont-TE	-2.27 (3.99)
C3	Rare-TE	4.01 (4.92)
	Occas-TE	1.56 (2.64)
	Cont-TE	-2.27 (3.95)
CZ	Rare-TE	3.20 (5.02)
	Occas-TE	1.72 (3.85)
	Cont-TE	-2.03 (3.35)
C4	Rare-TE	3.28 (4.22)
	Occas-TE	1.50 (2.13)
	Cont-TE	-1.61 (2.78)
P3	Rare-TE	3.44 (4.74)
	Occas-TE	0.705 (3.22)
	Cont-TE	-1.68 (3.30)
PZ	Rare-TE	3.49 (5.56)
	Occas-TE	1.68 (3.77)
	Cont-TE	-1.26 (2.59)
P4	Rare-TE	3.41 (4.67)
	Occas-TE	0.968 (2.47)
	Cont-TE	0.921 (2.16)

Since CNV is a negative potential, a positive difference in the table indicates that CNV during the choice trials was higher than during the simple trials.

Table 3. Simple-choice difference scores: ANOVA table reporting main effects for group

Dependent variable	df	F	Significance
F3	2.48	7.740	0.001
FZ	2.48	9.118	0.000
F4	2.48	8.006	0.001
C3	2.48	10.571	0.000
CZ	2.48	6.927	0.002
C4	2.48	9.992	0.000
P3	2.48	7.419	0.002
PZ	2.48	5.408	0.008
P4	2.48	7.091	0.002

There were significant main effects for group at all electrodes measured.

3.3.4. MANOVA of EEG coherence estimates during the choice trials

A third MANOVA was performed with group as the factor and coherence during the choice trials as variates. This analysis revealed a significant main effect for group [multivariate $F(27, 23) = 5.55, p < 0.001$]. This overall significance resulted from main effects for group for interhemispheric F3F4 coherence in the 6–12, 12–25, and 25–45 Hz frequency bands: $F(2, 48) = 11.64, P 0.0001$; $F(2, 48) = 11.81, p < 0.0001$; and $F(2, 48) = 7.87, p = 0.001$, respectively. Individual comparisons revealed significantly higher F3F4 coherence in the Cont-TE subjects in the three bands compared with the Occas-TE subjects [$t(33) = -2.33, p = 0.024$; $t(33) = -3.10, p = 0.003$; and $t(33) = -2.93, p = 0.005$, respectively] and to the Rare-TE subjects [$t(33) = -4.82, p < 0.001$; $t(33) = -4.80, p < 0.001$; $t(33) = -3.80, p < 0.001$, respectively]. Occas-TE subjects had higher frontal coherence than the Rare-TE subjects in the 6–12 Hz band only, $t(33) = 2.51, p = 0.015$.

3.3.5. MANOVA of EEG amplitude estimates during the choice trials

A fourth MANOVA was performed with group as the factor and amplitude during the choice trials as variates. This analysis revealed

a significant main effect for group [multivariate $F(27, 23) = 2.56, p = 0.014$]. This overall significance resulted from main effects for group for 6-12 Hz amplitude at all electrodes except the midline parietal site [F3: $F(2, 48) = 6.27, p = 0.004$; Fz: $F(2, 48) = 6.21, p = 0.004$; F4: $F(2, 48) = 7.20, p = 0.002$; C3: $F(2, 48) = 5.56, p = 0.007$; Cz: $F(2, 48) = 6.18, p = 0.004$; C4: $F(2, 48) = 10.81, p < 0.001$; P3: $F(2, 48) = 8.63, p = 0.001$; P4: $F(2, 48) = 5.45, p = 0.007$]. Multiple comparisons revealed significantly higher 6–12 Hz amplitude at eight electrodes in the Cont-TE subjects compared with the Rare-TE subjects [F3: $t(33) = 3.49, p = 0.001$; Fz: $t(33) = 3.52, p < 0.001$; F4: $t(33) = 3.79, p < 0.001$; C3: $t(33) = 3.28, p = 0.002$; Cz: $t(33) = 3.10, p = 0.003$; C4: $t(33) = 4.45, p < 0.001$; P3: $t(33) = 3.893, p < 0.001$; P4: $t(33) = 3.23, p < 0.002$] and compared with the Occas-TE subjects at Cz, C4 and P3 [Cz: $t(33) = 3.02, p = 0.004$; C4: $t(33) = 3.49, p = 0.001$; P3: $t(33) = 3.19, p = 0.003$]. There were no significant amplitude differences between the Rare-TE and Occas-TE subjects.

Table 4
Means (S.D.) for reaction time, accuracy, heart rate and breath rate during the simple and choice trials

Variable	Task	Rare-TE	Occas-TE	Cont-TE	p-value
Reaction time (ms)	Simple trials	421 (129)	389 (102)	378 (0.097)	ns
	Choice trials	699 (121)	673 (166)	664 (136)	ns
Accuracy (%)	Simple trials	na	na	na	na
	Choice trials	97.0 (5.62)	97.1(3.28)	98.0(4.39)	ns
Heart rate (bpm)	Simple trials	76.1 (13.9)	74.1 (8.3)	73.7 (10.3)	ns
	Choice trials	79.0 (10.8)	74.3 (7.2)	75.6 (8.6)	ns
Blink rate (bpm)	Simple trials	26.3 (9.1)	25.7 (9.3)	25.8 (10.3)	ns
	Choice trials	26.9 (8.9)	26.1 (12.3)	25.9 (15.7)	ns

na=not available; ns=not significant.

3.3.6. MANOVA of EEG amplitude and coherence during the rest/Transcendental Meditation period

Two MANOVAs were conducted to test group differences in amplitude and coherence during the rest/Transcendental Meditation sessions. One MANOVA used group as the factor and EEG amplitude during rest (Rare-TE subjects) and Transcendental Meditation practice (Occas-TE and Cont-TE subjects) as the variates. The other used EEG coherence as the variate.

The MANOVA of EEG amplitude did not reveal significant main effects for group [multivariate $F(27, 23) = 1.2$ ns]. This finding replicates earlier research reporting that EEG coherence better differentiates Transcendental Meditation groups than EEG amplitude (Dillbeck and Bronson, 1981).

The MANOVA of EEG coherence revealed a significant main effect for group [multivariate $F(27, 23) = 3.53, p = 0.005$]. This overall significance resulted from main effects for group for F3F4 coherence in the 6–12, 15–25, and 35–45 Hz frequency bands: $F(2, 48) = 7.87, p = 0.001$; $F(2, 48) = 13.87, p < 0.0001$; and $F(2, 48) = 15.43, p < 0.0001$, respectively. Multiple comparisons revealed significantly lower F3F4 coherence in the 6–12, 15–25 and 35–45 Hz bands in the Rare-TE subjects compared with Occas-TE subjects [$t(33)=2.50, p = 0.016$; $t(33)= 3.61, p = 0.001$; $t(33) = 2.41, p = 0.018$, respectively] and in comparison to the Cont-TE subjects [$t(33) = 4.52, p < 0.0001$; $t(33) = 3.10, p = 0.004$; $t(33) = 4.40, p < 0.0001$]. EEG coherence during Transcendental Meditation practice did not significantly differ between the Occas-TE and Cont-TE subjects [all $t(33) < 1.0$, ns], even though these two groups widely differed in years of Transcendental Meditation practice (7.8 compared with 24.5 years) and in self-reported experience of the integrated state (< 10 per year compared with continuous experiences). This apparent lack of Transcendental Meditation ‘practice effects’ as measured by broadband EEG coherence replicates earlier findings (Travis, 1991), and is discussed below.

3.4. Principal components analysis

Significant main effects were seen in 24 variables: simple CNV amplitude at four electrodes, simple-choice difference scores at nine electrodes, choice task EEG coherence between F3F4 in three frequency

bands, and choice task 6–12 Hz EEG amplitude at eight electrodes. Hair and colleagues (Hair et al., 1992) propose a minimum of five subjects/variable to obtain stable classification results. With 51 subjects, this criterion suggests a maximum of ten variables. Principal components analysis were used to reduce the 24 significant variables from the MANOVAs to a smaller number of factors that retained most of the information in the original data. The significant factors resulting from the principal components analysis were entered into a Pearson correlation analysis to identify relations among the cortical factors and scores on the paper-and-pencil tests, and in a stepwise regression to identify the fewest cortical factors necessary to discriminate groups.

Principal components analysis with a varimax rotation reduced the 24 variables to five factors that accounted for 83.4% of the original variance. The factor loadings are presented in Table 5. The first factor included frontal, central and parietal amplitude estimates in the 6–12 Hz band; the second included simple-choice difference scores at all electrodes except F3; the third included F3F4 EEG coherence at all frequencies; the fourth included simple CNV and simple-choice CNV difference scores at F3 only; and the last included simple CNV at FZ, F4 and C3. The variables loading > 0.60 on a specific factor were combined to form five composite measures. This was done by (1) converting the variables to z-scores, (2) weighting each variable by its factor loadings, and (3) averaging the weighted z-scored variables that loaded > 0.60 on each factor. These five composite measures were used in the analyses below.

3.5. Pearson correlation between the five factor scores and the two paper-and-pencil measures of transcendental experience

A Pearson correlation assessed the relation between each of the five brain-based composite measures and the self-report measures of mystical experiences (M-Scale) and of worldview along a Physical-Transcendent Scale (Baruss's Scale). This exploratory analysis revealed significant correlations between the two self-report measures with all five factors: (1) simple-choice difference scores ($r(50) = -0.478, p < 0.001$); (2) 6–12 Hz global amplitude during the choice trials ($r(50) = 0.462, p = 0.001$); (3) F3F4 EEG coherence at all frequencies ($r(50) = 0.434, p = 0.0012$); (4) simple CNV at FZ, F4 and C3 ($r(50) = -0.326, p = 0.021$); and (5)

simple CNV and simple-choice CNV difference scores at F3 ($r(50) = -0.447, p = 0.001$).

3.6. Stepwise regression

The five composite measures were entered into a stepwise regression with group as the criterion variable and the composite measures as the predictor variables. The stepwise regression entered three variables into the final model: F3F4 EEG coherence at all frequency bands, simple-choice CNV difference scores, and frontal, central and parietal 6–12 Hz amplitude estimates. The final model accounted for 55% of the total variance, and was highly significant, $F(3, 48) = 18.52, p < 0.0001$. Table 6 contains the output from the stepwise regression listing the variables that were included in and excluded from the final model.

3.6.1. Scatter plot of factor scores: a brain-based integration scale

The composite scores for the three factors entered in the model were arithmetically combined—the frontal EEG coherence factor plus the EEG amplitude factor minus the simple-choice CNV difference-score factor. The sign of the simple-choice CNV difference-score factor was changed because it was inversely related to group membership. This created a composite z-score for each subject. These composite z-scores are presented in the scatter plot in Fig. 4. The regression line through these points depicts the possible transformation in cortical functioning corresponding to increasing integration of the transcendental and waking states, and could be called an ‘Integration Scale.’ Individuals would score low on this Scale when (1) bilateral frontal EEG task coherence was low, (2) frontal, central and parietal 6–12 Hz task EEG amplitude was low, and (3) cortical preparatory processes were greater during choice trials than during simple trials. In contrast, individuals would score high on this Scale when (1) bilateral frontal EEG task coherence was high, (2) frontal, central and parietal 6–12 Hz task EEG amplitudes were high, and (3) cortical preparatory processes were lower during choice trials than during simple trials.

Table 5

Principal component analysis matrices of simple CNV, simple-choice CNV difference scores, EEG coherence, and amplitude

	Factor 1	2	3	4	5
<i>Simple CNV</i>					
F3	-0.147	-0.001	0.003	0.830	0.299
FZ	-0.045	0.245	-0.045	0.375	0.807
F4	-0.010	0.257	-0.047	0.548	0.609
C3	-0.190	0.212	-0.021	0.423	0.743
<i>Simple-choice difference scores</i>					
F3	-0.271	0.346	-0.053	0.834	0.018
FZ	-0.139	0.717	-0.143	0.350	0.305
F4	-0.190	0.629	-0.041	0.539	0.130
C3	-0.162	0.736	-0.107	0.072	0.481
CZ	-0.170	0.863	-0.027	0.200	0.144
C4	-0.129	0.914	-0.080	0.188	0.124
P3	-0.082	0.918	-0.126	0.048	0.049
PZ	-0.145	0.915	-0.060	0.026	0.123
P4	-0.061	0.942	-0.144	0.095	0.057
<i>F3F4 EEG coherence during choice tasks</i>					
6-12 Hz	0.061	-0.149	0.870	-0.007	-0.064
12-25 Hz	0.078	-0.124	0.960	-0.032	0.012
25-45 Hz	-0.048	-0.117	0.910	-0.031	-0.012
<i>6-12 Hz EEG amplitude during choice tasks</i>					
F3	0.889	-0.147	-0.037	0.050	-0.145
FZ	0.936	0.118	-0.025	-0.004	-0.061
F4	0.908	-0.181	0.033	0.013	0.017
C3	0.923	-0.094	-0.008	0.033	-0.159
CZ	0.811	-0.070	0.107	-0.196	-0.052
C4	0.883	-0.119	0.169	-0.080	-0.124
P3	0.906	-0.092	-0.068	-0.174	-0.034
P4	0.816	-0.128	-0.016	-0.225	0.185

The 24 variables that loaded on five factors (> 0.600) are bolded for easier identification.

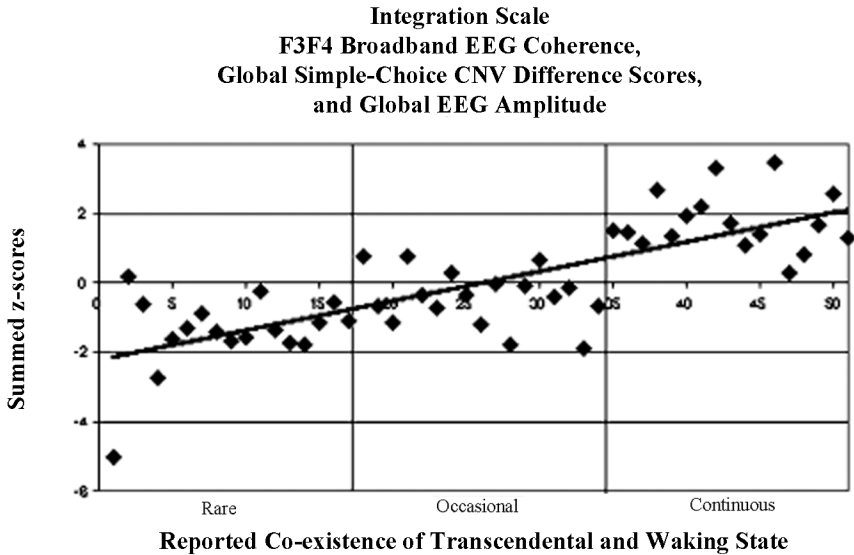


Fig. 4. A brain-based integration scale. The three factors entered in the step-wise regression were transformed to z-scores, combined for each subject, and plotted according to self-reported integration of transcendental and waking states. The regression line through these points represents possible transformations in cortical functioning corresponding to increasing integration of the transcendent and waking states, and may thus represent an 'integration scale.'

Table 6
The final model

Variables included	Beta	Partial correlation	t-statistic	p-value
Constant	-	-	3.42	0.001
6–45 Hz F3F4 EEG	0.371	-	3.45	0.001
Coherence during choice trials				
Frontal, central and parietal	-0.362	-	-3.41	0.001
simple-choice CNV difference scores				
Frontal, central and parietal	0.278	-	2.61	0.012
6–12 Hz EEG amplitude during choice trials				
<i>Variables excluded</i>				
Simple CNV at FZ, F4, and C3	-0.099	-0.1029	-0.873	ns
Simple and simple-difference scores at F3	-0.130	-0.143	-0.969	ns

Stepwise regression was performed with group as the criterion variable and the five factor scores as predictor variables. Three of the five factor scores were significant and were included in the final model in the order they are presented in the table.

4. Discussion

Significant group differences in electrocortical measures during waking support the hypothesis that distinct CNV and EEG patterns characterize the integration of the transcendent with waking states. The three factors entered in the final model suggest at least three cortical characteristics of this integrated state: (1) high frontal 6–12 Hz EEG coherence during tasks, (2) high frontal, central and parietal 6–12 Hz amplitude during tasks, and (3) different patterns of CNV amplitude during simple and choice tasks.

4.1. Implications of the factors in the final model: broadband frontal EEG coherence

4.1.1. Role of the frontal cortex

The frontal cortex is reciprocally connected with nearly all other cortices, with subcortical structures and with brainstem nuclei (Fuster, 1993). This extensive neural connectivity supports the executive role that the frontal cortices are considered to play in generating and guiding goal-directed behavior. Deficits in frontal functioning have been linked to impairments in encoding and recognition tasks, judgment, emotion regulation, delayed response and planning processes (Davidson et al., 2000; Donaldson and Rugg, 1998; Fuster, 1999; Godefroy and Rousseaux, 1996). Relevant to this research, the frontal cortices are also essential to neuronal implementation of a ‘self-model’—one’s self-concept, sense of personal identity, body-centered spatial perspective, self-evaluation, and long-term unity of beliefs and attitudes (Ben Shalom, 2000; Keenan et al., 2000; Vogeley et al., 1999). Thus, a changed pattern of frontal functioning might be expected in subjects reporting a greater sense of self during activity.

4.1.2. EEG coherence

EEG coherence is understood to be a measure of cortical connectivity (Florian et al., 1998). Lower values of EEG coherence are associated with white matter lesions and decreased cerebral blood flow (Leuchter et al., 1997), schizophrenia (Wada et al., 1998), depression (Leuchter et al., 1997), and normal aging (Kayama et al., 1997). Higher levels

of coherence are associated with functional coupling (Thatcher et al., 1986), information exchange (Petsche et al., 1997; Pfurtscheller and Andrew, 1999), and functional co-ordination (Gevins et al., 1989) between brain regions. Higher frontal EEG coherence suggests greater functional coordination of the frontal circuits involved in the neuronal implementation of one's self-model. This may give prominence to the experience of one's self-model during task processing, as was reported by the Cont-TE subjects. Increased values of executive control and the enhancement of sense of self could provide a different vantage point, for processing stimuli, as evidenced in the different patterns of CNV data in the Cont-TE subjects.

4.1.3. Broad-band changes

Finally, it was unexpected that coherence differences between groups would be seen over a wide range of frequencies (6–45 Hz). Typically EEG during tasks is maximal in more narrow bands. For instance, the alpha band is generally associated with relaxation and meditation (Banquet, 1973; Pfurtscheller et al., 1996; Travis and Wallace, 1999); the beta band is associated with task processing (Pfurtscheller and Andrew, 1999); and the gamma band is associated with perceptual binding and possibly the unity of conscious experience (Basar-Eroglu et al., 1996; Bertrand and Tallon-Baudry, 2000; Llinas and Ribary, 2001). Varela et al. (2001) have suggested that coherence over multiple frequency bands may be a mechanism that links distributed functional regions into a pattern that supports a 'unified cognitive moment.' In this light, broad-band coherence during tasks may underlie the integration of TE (alpha) with cognitive processes (beta and gamma) during tasks.

4.2. Implications of the factors in the final model: frontal, central and parietal 6–12 Hz EEG amplitude estimated

What mechanisms contributed to increased 6–12 Hz EEG amplitudes at frontal, central and parietal sites during eyes-open tasks? EEG amplitude varies with skull thickness (Nunez, 1981). However, differences in skull thickness would not explain the current data, because EEG amplitudes only differed during tasks—not during meditation. The increased 6–12 Hz EEG amplitude during tasks may indicate that a global functional brain state associated with Transcendental Medi-

tation practice may coexist with brain processes associated with task processing.

Earlier, we proposed a physiological model of Transcendental Meditation practice comprising two complementary neural networks (Travis and Wallace, 1999). First, prefrontal and basal forebrain areas act as a 'neural switch' to inhibit thalamocortical activity. This leads to reduced levels of mental activity without loss of self-awareness—a 'de-excited' state of mind and body. Second, cortico-basal ganglia-thalamocortical (BGT) oscillations, which modulate cortical excitability (Elbert and Rockstroh, 1987) and sequencing of cognitive events (Alexander et al.), (CBGT) oscillations, which modulate cortical excitability (Elbert and Rockstroh, 1987) and sequencing of cognitive events (Alexander et al., 1986; Bernes and Sejnowski, 1996), maintain this de-excited meditative state. Five parallel CBGT modules have been traced (Alexander et al., 1986). Two loops, which originate in the premotor and parietal multimodal sensory areas, probably contribute little to loop dynamics during Transcendental Meditation practice, because Transcendental Meditation is practiced sitting quietly with eyes closed. The remaining three modules may contribute to maintaining a 'de-excited' state during Transcendental Meditation practice. These loops, which originate in the dorsal-lateral frontal, orbito-frontal and anterior cingulate cortices, modulate attention allocation (Carter et al., 1999), modulation of emotional tone (Bush et al., 2000), and implementation of a self model (Vogeley et al., 1999). The Transcendental Meditation technique doesn't overtly engage these modules, rather it permits them to maintain resting rhythms of CBGT oscillations. During Transcendental Meditation practice, these CBGT loops may generate a oscillatory state that facilitates mental and physical de-excitation. Recent preliminary data localized MEG dipoles in ventral medial and cingulate cortices during Transcendental Meditation practice (Yamada, personal communication, 20 June 2002), supporting the possible involvement of these areas during Transcendental Meditation practice. These three CBGT modules, engaged during Transcendental Meditation practice, may over time become self-sustaining and coexist with sensory processing characteristic of waking (Llinas and Pare, 1991). The characteristic brain signature of Transcendental Meditation practice, global alpha EEG, might then be seen during ongoing waking processes.

4.3. Implications of the factors in the final model: inverse CNV amplitudes during simple and choice tasks

The three groups exhibited an inverse pattern of late CNV during simple and choice tasks: Rare-TE subjects exhibited lower simple CNV and higher choice CNV, while the Cont-TE subjects exhibited the opposite. Late CNV in simple trials primarily reflects attentional (Kok, 1997; Tecce and Cattanach, 1993) and motor resources (Gaillard, 1986; van Boxtel and Brunia, 1994) recruited for task processing. Late CNV in choice trials includes an additional component, called the stimulus preceding negativity (SPN), which is observed preceding a stimulus that provides information needed to make a correct response (Brunia, 1988; Brunia and van Boxtel, 2001; Ruchkin et al., 1986). While choice CNV amplitudes include additional negativity from the SPN, choice CNV might be expected to be lower than during simple trials, because the contribution of attentional and motor preparatory processes would be less during choice trials since subjects needed the information from S2 before initiating response processes.

Rare-TE subjects exhibited higher choice CNV. These subjects appeared to initiate preparatory processes—committing attentional resources and/or initiating motor processes—before they knew what they needed to do. In contrast, the Cont-TE subjects exhibited lower CNV in the choice trials. Apparently, the Cont-TE subjects did not initiate preparatory responses until they knew the correct response. This more efficient approach of information processing reflects better executive control over preparatory and motor response processes—allocating resources at a more appropriate time to carry out the task effectively. This improved ‘executive control’ during the CNV tasks, along with heightened interhemispheric frontal EEG coherence, suggests a general enhancement of frontal cortical functioning in the Cont-TE subjects.

The inverse relation of CNV during simple and choice trials across groups did not appear to reflect increased difficulty of the choice trials, since there were no significant group differences in reaction time, in accuracy, or in physiological arousal, as reflected in heart rate and breath rate, during either simple or choice trials. Nor does this inverse relation appear to reflect intentional, conscious control, since none of the subjects reported using different strategies for the two tasks.

4.3.1. Relation of EEG coherence and CNV patterns

While EEG coherence is a measure of stability of phase relations among surface-recorded scalp potentials (Thatcher et al., 1986), and could be termed 'horizontal' coherence, research also reports coherence between cortical, thalamic, and muscle potentials during voluntary muscle movement in humans (Marsden and Werhahn, 2000). This could be called 'vertical' coherence. Marsden and colleagues (Marsden et al., 2000) suggest that 'vertical' coherence could provide the temporal framework for guiding motor output. While 'vertical' coherence was not measured in this study, one could speculate that the 'horizontal' coherent EEG activity observed between frontal cortices in the Cont-TE subjects may be part of a 'vertically' coherent circuit between cortex, basal ganglia, thalamus, and muscles controlling response preparation in these subjects. This 'vertical' coherence circuit may have contributed to the observed inverse pattern in CNV in these subjects. Multiple cortical and subcortical areas implicated in CNV generation support this speculation, including: bilateral frontal, motor cortex, superior-parietal, anterior cingulate gyrus, and basal ganglia (Gomes, et al., 2001; Rektor, 2000).

4.4. Implication of the lack of observed Transcendental Meditation 'practice effects'

The lack of Transcendental Meditation 'practice effects' in EEG patterns may be an important datum to help guide future research. This finding suggests that Transcendental Meditation practice can be mastered in a relatively short period of time, and that the effects of Transcendental Meditation practice over time may be more evident in behavior outside of meditation. Early efficacy of practice combined with progressive changes in brain dynamics in waking behavior may constitute a fundamental set of criteria for comparing Transcendental Meditation practice with other types of meditation practice.

4.5. Design considerations

The group differences are empirically strong, but we cannot conclude what caused those group differences. Since a cross-sectional design was used, we do not know the pre-Transcendental Meditation EEG patterns of subjects in the Occas-TE and Cont-TE groups. The published

immediate effects of Transcendental Meditation practice on CNV amplitude and EEG coherence suggest that the group differences reported here may have resulted from Transcendental Meditation practice. Paty and colleagues (Paty et al., 1978) reported that CNV amplitude in simple tasks increased immediately following Transcendental Meditation practice compared with CNV before the Transcendental Meditation session. They suggested that Transcendental Meditation practice might make available different levels of attention, leading to higher CNV amplitude after Transcendental Meditation practice (p. 164). In addition, EEG coherence during eyes-open rest is reported to be higher in matched subjects with 8 years' Transcendental Meditation practice compared with those with 4 months' Transcendental Meditation practice (Travis, 1991). These documented immediate and short-term effects of transcending on brain dynamics may stabilize over time leading to the long-term effects observed in the Cont-TE subjects. Ongoing longitudinal research is testing this hypothesis.

4.6. Comparison with earlier CNV data

These present findings are similar to the findings from our earlier investigation of non-Transcendental Meditation, short-term and long-term Transcendental Meditation subjects (Travis et al., 2000). The previous study reported significantly higher simple CNV amplitude at frontal and central midline sites with greatest differences at CZ; the current study found significant group differences in simple CNV amplitude at two frontal sites (FZ, F4), and at C3—roughly over the motor cortex governing right-hand finger movement. In both studies, inner experiences were associated with changes in cortical preparatory response at frontal and central sites.

One surprising difference between the two studies is that the CNV amplitudes reported in the previous work were consistently higher. This could be due to (1) the age of subjects (around 20 years in the previous study compared with 40 years in the current study); (2) the addition of choice trials and choice divided-attention trials in the current study (leading to greater total testing time, greater challenge and possibly greater fatigue); and (3) possible experimenter effects. For instance, if the experimenter more strongly emphasized eye-movement control in the current study, then subjects may have focused on inhibiting blinks.

This might have reduced a 'unified attentional set' to S2 leading to lower CNV amplitudes (Tecce and Cattanaach, 1993). Future research will look at these different issues.

4.7. Application of an integration scale

The Integration Scale, which was constructed from the current data, could be used to measure the interdependence of integrative experiences, brain executive functioning and sense of self in various subject populations. Through the language of brain functioning, this brain-based scale could provide the opportunity to conduct comparative research of various cognitive techniques, including relaxation techniques and other traditional meditation practices. It also could be used to probe the contribution of integrative experiences to success in business, arts, and sciences. Furthermore, scores on this Scale appear to represent the transformation in brain functioning corresponding to the integration of the transcendent with waking and sleeping. This integrated state is distinct from waking, sleeping or dreaming, and is traditionally termed 'enlightenment' (Maharishi Mahesh Yogi, 1967; Shear, 1999). It is possible that this brain-based Integration Scale may help elucidate the development and characteristics of the state of enlightenment, augmenting current phenomenological and psychological investigations (Gallagher and Shear, 1999; Shear and Jevning, 1999). This line of research could dramatically impact our understanding of the possible range of human development.

5. Conclusion

In summary, these data suggest that distinct patterns of EEG coherence, EEG amplitude, and late CNV amplitude are associated with the progressive integration of the transcendent with waking and sleeping states. These results indicate the efficacy of objective measures for characterizing the growth of subjective experiences. The brain-based Integration Scale, resulting from this research, is a preliminary scale. It accounted for 55% of the variance in group membership. Researchers are invited to participate in confirming, refining, and extending this scale. We anticipate this research strategy will further the exploration of the possible range of human experience and associated brain-state dynamics.

References

- Alexander, G.E., DeLong, M.R., Strick, P.L., 1986. Parallel organization of functionally segregated circuits linking basal ganglia and cortex. *Annual Review of Neuroscience* 9, 335–381.
- Badawi, K., Wallace, R.K., Orme-Johnson, D., Rouzere, A.M., 1984. Electrophysiologic characteristics of respiratory suspension periods occurring during the practice of the transcendental meditation program. *Psychosomatic Medicine* 46 (3), 267–276.
- Banquet, J.P., 1973. Spectral analysis of the EEG in meditation. *Electroencephalography and Clinical Neurophysiology* 35 (2), 143–151.
- Banquet, J.P., Sailhan, M., 1974. Quantified EEG spectral analysis of sleep and Transcendental Meditation. *Electroencephalography and Clinical Neurophysiology* 42, 445–453.
- Baruss, E., Moore, R.J., 1992. Measurement of beliefs about consciousness and reality. *Psychology Reports* 71, 59–64.
- Basar-Eroglu, C., Struber, D., Schurmann, M., Stadler, M., Basar, E., 1996. Gamma-band responses in the brain: a short review of psychophysiological correlates and functional significance. *International Journal of Psychophysiology* 24, 101–112.
- Ben Shalom, D., 2000. Developmental depersonalization: the prefrontal cortex and self-functions in autism. *Consciousness and Cognition* 9, 457–460.
- Bernes, G.S., Sejnowski, T.J., 1996. How the basal ganglia makes decisions. In: Demasio, A.R. (Ed.), *Neurobiology of Decision-Making*. Springer, Berlin, pp. 101–113.
- Bertrand, O., Tallon-Baudry, C., 2000. Oscillatory gamma activity in humans: a possible role for object representation. *International Journal of Psychophysiology* 38, 211–223.
- Brunia, C.H., 1988. Movement and stimulus preceding negativity. *Biological Psychology* 26 (1–3), 165–178.
- Brunia, C.H., Damen, E.J., 1988. Distribution of slow brain potentials related to motor preparation and stimulus anticipation in a time estimation task. *Electroencephalography and Clinical Neurophysiology* 69 (3), 234–243.
- Brunia, C.H., van Boxtel, G.J., 2001. Wait and see. *International Journal of Psychophysiology* 43 (1), 59–75.

- Bush, G., Luu, P., Posner, M.I., 2000. Cognitive and emotional influence in anterior cingulate cortex. *Trends in Cognition Science* 4, 215–222.
- Carter, C.S., Botvinivk, M.M., Cohen, J.D., 1999. The contribution of the anterior cingulate cortex to executive processes in cognition. *Review of Neuroscience* 10 (1), 49–57.
- Davidson, R.J., Jackson, D.C., Kalin, N.H., 2000. Emotion, plasticity, context, and regulation: perspectives from affective neuroscience. *Psychological Bulletin* 126 (6), 890–909.
- 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, 3–4.
- Donaldson, D.I., Rugg, M.D., 1998. Recognition memory for new associations: electrophysiological evidence for the role of recollection. *Neuropsychologia* 36 (5), 377–395.
- Elbert, T., Rockstroh, B., 1987. Threshold regulation—a key to the understanding of the combined dynamics of EEG and event-related potentials. *Journal of Psychophysiology* 4, 317–333.
- Farrow, J.T., Hebert, J.R., 1982. Breath suspension during the transcendental meditation technique. *Psychosomatic Medicine* 44 (2), 133–153.
- Florian, G., Andrew, C., Pfurtscheller, G., 1998. Do changes in coherence always reflect changes in functional coupling. *Electroencephalography and Clinical Neurophysiology* 106 (1), 87–91.
- Fuster, J.M., 1993. Frontal lobes. *Current Opinion in Neurobiology* 3 (2), 160–165.
- Fuster, J.M., 1999. Cognitive Functions of the Frontal Lobes, In: B.L. Miller, and J.L. Cummings, (Eds.) *The Human Frontal Lobes, Functions and Disorders*, Guilford Press, New York. pp. 187–195.
- Gaillard, A.W.K., 1986. The CNV as an index of response preparation. In: R. Zappoli & R. Denoth. (Eds.), *Cerebral Psychophysiology: Studies in Event-Related Potentials*, vol. EEG supplement 38. Elsevier, Amsterdam, pp. 196–206.
- Gallagher, S., Shear, J. (Eds.), *Models of the Self*. Imprint Academic, Thorverton, England, 1999.
- Gevins, A.S., Bessler, S.L., Morgan, N.H., Cutillo, B.A., White, R.M., Greer, D.S., Illes, J., 1989. Event-related covariances dur-

- ing a bimanual visuomotor task. I. methods and analysis of stimulus- and response-locked data. *Electroencephalography and Clinical Neurophysiology* 74, 58–75.
- Godefroy, O., Rousseaux, M., 1996. Binary choice in patients with prefrontal or posterior-brain damage. A relative judgement theory analysis. *Neuropsychologia* 34 (10), 1029–1038.
- Gomes, C.M., Delinte, A., Vaquero, E., Cardoso, M.J., Vazquez, M., Crommelinck, M., Roucoux, A., 2001. Current source density analysis of CNV during temporal gap paradigm. *Brain Topography* 13, 49–59.
- Gratton, G., Coles, M.G.H., Donchin, M., 1983. A new method for off-line removal of ocular artifacts. *Electroencephalography and Clinical Neurophysiology* 55, 468–484.
- Hair, J.F., Anderson, R.E., Tatham, R.L., Black, W.C., 1992. *Multivariate Data Analysis*. Macmillan Publishing Co, New York.
- Hartwell, J., 1995. *EEG SYS User's Guide*. Friends Medical Science Research Center, Inc, Baltimore, MD.
- Hood, R.W., 1975. The construction and preliminary validation of a measure of reported mystical experience. *Journal of Scientific Study of Religion* 14, 29–41.
- James, W., 1961. *Varieties of Religious Experiences*. Collier Books, New York.
- Kayama, K., Hirasawa, H., Okubo, Y., Karasawa, A., 1997. Quantitative EEG correlates of normal aging in the elderly. *Clinical Electroencephalography* 28, 160–165.
- Keenan, J.P., Wheeler, M.A., Gallup, G.G., Jr, Pascual-Leone, A., 2000. Self-recognition and the right prefrontal cortex. *Trends in Cognition Science* 4 (9), 338–344.
- Kok, A., 1997. Event-related potential (ERP) reflections of mental resources: a review and synthesis. *Biological Psychology* 45, 19–56.
- Lehmann, D., Faber, P.L., Achermann, P., Jeanmonod, D., Gianotti, L.R., Pizzagalli, D., 2001. Brain sources of EEG gamma frequency during volitionally meditation-induced, altered states of consciousness, and experience of the self. *Psychiatry Research* 108 (2), 111–121.
- Leuchter, A.F., Cook, I.A., Uijtdeharge, S.H., Dunkin, J., Lufkin, R.B., Anderson-Hanley, C., Abrams, M., Rosenberg-Thompson,

- S., O'Hara, R., Simon, S.L., Osato, S., Babaie, A., 1997. Brain structure and function and the outcomes of treatment for depression. *Journal in Clinical Psychiatry* 58 (Suppl.16), 22–31.
- Llinas, R.R., Pare, D., 1991. Commentary of dreaming and wakefulness. *Neuroscience* 44, 521–538.
- Llinas, R., Ribary, U., 2001. Consciousness and the brain: the thalamocortical dialogue in health and disease. In: Marijuan, P.C. (Ed.), *Cajal and Consciousness: Scientific Approaches to Consciousness on the Centennial of Ramon Y Cajal's Textura*. New York Academy of Sciences, New York, NY, pp. 166–175.
- Maharishi Mahesh Yogi. 1963. *Science of Being and Art of Living*. Penguin Books, New York.
- Maharishi Mahesh Yogi. 1967. *Bhagavad Gita: A New Translation and Commentary, Chapters 1–6*. MIU Press, Fairfield, IA.
- Marsden, J.F., Werhahn, K.J., 2000. Organization of cortical activities related to movement in humans. *Journal of Neuroscience* 20 (6), 2307–2314.
- Marsden, J.F., Ashby, P., Limousin-Dowsey, P., Rothwell, J.C., Brown, P., 2000. Coherence between cerebellar thalamus, cortex, and muscle in man. *Brain* 123, 1459–1470.
- Maslow, A., 1972. *The Farthest Reaches of Human Nature*. Penguin, New York.
- Mason, L.I., Alexander, C.N., Travis, F.T., Marsh, G., Orme-Johnson, D.W., Gackenbach, J., Mason, D.C., Rainforth, M., Walton, K.G., 1997. Electrophysiological correlates of higher states of consciousness during sleep in long-term practitioners of the transcendental meditation program. *Sleep* 20 (2), 102–110.
- Miller, G.A., Gratton, G., Yee, C.M., 1988. Generalized implementation of an eye movement correction procedure. *Psychophysiology* 25, 241–243.
- Mocks, J., Gasser, T., 1984. How to select epochs of the EEG at rest for quantitative analysis. *Electroencephalography and Clinical Neurophysiology* 58, 89–92.
- Newberg, A., Alavi, A., Baime, M., Pourdehnad, M., Santanna, J., d'Aquili, E., 2001. The measurement of regional cerebral blood flow during the complex cognitive task of meditation: a preliminary SPECT study. *Psychiatry Research* 106 (2), 113–122.

- Nuñez, P., 1981. *Electric Fields of The Brain*. Oxford University Press, New York.
- Paty, J., Brenot, P., Tignol, J., Bourgeois, M., 1978. Activités évoquées cérébrales (variation contingente négative et potentiels évoqués) et états de conscience modifiés (relaxation sophronique, méditation transcendantale). *Annales Medico-Psychologiques* 136 (1), 143–168.
- Persinger, M.A., 1984. Striking EEG profiles from single episodes of glossolalia and transcendental meditation. *Perception and Motor Skills* 58 (1), 127–133.
- Persinger, M.A., 1993. Transcendental Meditation and general meditation are associated with enhanced complex partial epileptic-like signs: evidence for ‘cognitive’ kindling. *Perception and Motor Skills* 76 (1), 80–82.
- Petsche, M., Kaplan, S., von Stein, A., Filz, O., 1997. The possible meaning of the upper and lower alpha frequency ranges for cognitive and creative tasks. *International Journal of Psychophysiology* 26, 77–97.
- Pfurtscheller, G., Andrew, C., 1999. Event-related changes of band power and coherence: methodology and interpretation. *Journal of Clinical Neurophysiology* 16 (6), 512–519 (Official Publication of the American Electroencephalographic Society).
- Pfurtscheller, G., Stancák, A., Jr, Neuper, C., 1996. Event-related synchronization (ERS) in the alpha band—an electrophysiological correlate of cortical idling: a review. *International Journal of Psychophysiology* 24 (1–2), 39–46 (Official Journal of The International Organization for Psychophysiology).
- Picton, T.W., Bentin, S., Berg, P., Donchin, E., Hillyard, R., Johnson, J.R., Miller, G.A., Ritter, W., Ruchkin, D.S., Rugg, M.D., Taylor, M.J., 2000. Guidelines for using human event-related potentials to study cognition: recording in standards and publication criteria. *Psychophysiology* 37, 127–152.
- Picton, T.W., Hillyard, S.A., 1972. Cephalic skin potentials in EEG. *Electroencephalography and Clinical Neurophysiology* 33, 419–424.
- Rektor, I., 2000. Parallel Information processing in motor systems: intercerebral recordings of readiness potential and CNV in human subjects. *Neural Plasticity* 7, 65–72.

- Ruchkin, D.S., Sutton, S., Mahaffey, D., Glaser, J., 1986. Terminal CNV in the absence of motor response. *Electroencephalography and Clinical Neurophysiology* 63 (5), 445–463.
- Shear, J., 1999. Experiential clarification of the problem of self. In: Gallagher, S., Shear, J. (Eds.), *Models of the Self*. Imprint Academic, Thorverton, England, pp. 407–420.
- Shear, J., Jevning, R., 1999. Pure consciousness: scientific exploration of meditation techniques. *Journal of Consciousness Studies* 6 (2–3), 189–209.
- Shearer, A., Russell, P., 1978. *The Upanishads*. Harper and Row, New York.
- Stern, R.M., Ray, W.J., Davis, C.M., (1976). *Psychophysiological Recording*. Oxford Press, New York.
- Tecce, J.J., 1972. Contingent negative variation (CNV) and psychological processes in man. *Psychological Bulletin* 77 (2), 73–108.
- Tecce, J.J., Cattanach, L., 1993. Contingent negative variation (CNV). In: Neidermeyer, E., da Silva, L. (Eds.), *Electroencephalography: Basic Principles, Clinical Applications, and Related Fields*. Williams and Wilkins, Baltimore, pp. 887–910.
- Thatcher, R.W., Krause, P.J., Hrybyk, M., 1986. Cortico-cortical associations and EEG coherence: a 2-compartmental model. *Electroencephalography and Clinical Neurophysiology* 64 (2), 123–143.
- Travis, F.T., 1991. Eyes open and Transcendental Meditation EEG patterns after one and after 8 years of Transcendental Meditation practice. *Psychophysiology* 28 (3a), S58.
- Travis, F., 2001. Autonomic and EEG patterns distinguish transcending from other experiences during transcendental meditation practice. *International Journal of Psychophysiology* 42 (1), 1–9 (Official Journal of the International Organization of Psychophysiology).
- Travis, F., Wallace, R.K., 1997. Autonomic patterns during respiratory suspensions: possible markers of transcendental consciousness. *Psychophysiology* 34 (1), 39–46.
- Travis, F., Wallace, R.K., 1999. Autonomic and EEG patterns during eyes-closed rest and Transcendental Meditation practice: the basis for a neural model of Transcendental Meditation practice. *Consciousness and Cognition* 8 (3), 302–318.

- Travis, F., Pearson, C., 2000. Pure consciousness: distinct phenomenological and physiological correlates of 'consciousness itself.' *The International Journal of Neuroscience* 100, 1-4.
- Travis, F., Tecce, J.J., Guttman, J., 2000. Cortical plasticity, contingent negative variation, and transcendent experiences during practice of the transcendental meditation technique. *Biological Psychology* 55 (1), 41-55.
- Travis, F.T., Olson, T.M., Mason, L., in press. Psychophysiological Correlates of Higher States of Consciousness: Tutorial and Review. *Modern Science and Vedic Science*, in press.
- van Boxtel, G.J., Brunia, C.H., 1994. Motor and non-motor components of the contingent negative variation. *International Journal of Psychophysiology* 17 (3), 269-279.
- Varela, F., Lachaux, J.-P., Rodriguez, E., Martinerie, J., 2001. The brainweb: phase synchronization and large-scale integration. *Neuroscience* 2, 220-230.
- Vogeley, K., Kurthen, M., Falkai, P., Maier, W., 1999. Essential functions of the human self model are implemented in the prefrontal cortex. *Consciousness and Cognition* 8, 343-363.
- Wada, Y., Nanbu, Y., Kikuchi, M., Koshino, Y., Hashimoto, T., Yamaguchi, N., 1998. Abnormal functional connectivity in Alzheimer's disease; Intrahemispheric EEG coherence during rest and photic stimulation. *European Archives of Psychiatry and Clinical Neuroscience* 248, 203-208.
- Wallace, R.K., 1970. Physiological effects of transcendental meditation. *Science* 167 (926), 1751-1754.
- Walsh, R., 1982. The original goals of meditation. *The American Journal of Psychiatry* 139 (11), 1525-1526.
- Walter, W.G., Cooper, R., Aldridge, V.J., McCallum, W.C., Winter, A.L., 1964. Contingent negative variation. An electric sign of sensorimotor association and expectancy in the human brain. *Nature* 203, 380-384.

This article “Patterns of EEG Coherence, Power, and Contingent Negative Variation Characterize the Integration of Transcendental and Waking States,” by F. Travis et al., here revised/updated, reprinted with permission, was originally published in *Biological Psychology* 61 (2002) 293-319 © 2002 Elsevier Science B.V. All rights reserved.

Acknowledgements

I thank Ken Walton, Jeremy Fields, and the reviewers for their input on earlier versions of this manuscript.

**Psychological and Physiological Characteristics
of a Proposed Object-Referral/Self-Referral
Continuum of Self-Awareness**

■

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ABSTRACT

This research extends and confirms recent brainwave findings that distinguished an individual's sense-of-self along an Object-referral/Self-referral Continuum of self-awareness. Subjects were interviewed and were given tests measuring inner/outer orientation, moral reasoning, anxiety, and personality. Scores on the psychological tests were factor analyzed. The first unrotated PCA component of the test scores yielded a "Consciousness Factor," analogous to the intelligence "g" factor, which accounted for over half of the variance among groups. Analysis of unstructured interviews of these subjects revealed fundamentally different descriptions of self-awareness. Individuals who described themselves in terms of concrete cognitive and behavioral processes (predominantly Object-referral mode) exhibited lower Consciousness Factor scores, lower frontal EEG coherence, lower alpha and higher gamma power during tasks, and less efficient cortical preparatory responses (contingent negative variation). In contrast, individuals who described themselves in terms of an abstract, independent sense-of-self underlying thought, feeling and action (predominantly Self-referral mode) exhibited higher Consciousness Factor scores, higher frontal coherence, higher alpha and lower gamma power during tasks, and more efficient cortical responses. These data suggest that definable states of brain activity and subjective experiences exist, in addition to waking, sleeping and dreaming, that may be operationally defined by psychological and physiological measures along a continuum of Object-referral/Self-referral Continuum of self-awareness.

1. Introduction

Consciousness research employs a variety of techniques and approaches to explore the nature of human experience. Neural imaging techniques, including EEG, MEG, PET, and fMRI, have been used to characterize different mental processes and internal states including attention (Posner, Petersen, Fox, & Raichle, 1988; Posner & Raichle, 1998), word generation (Petersen, Fox, Posner, Mintun, & Raichle, 1988; Snyder, Abdullaev, Posner, & Raichle, 1995), emotional states (Davidson, 2002; Davidson, Pizzagalli, Nitschke, & Putnam, 2002; Gur et al., 2002), and moral reasoning (Chayer & Freedman, 2001; Moll et al., 2002; Moll, Eslinger, & Oliveira-Souza, 2001). Patterns of brain functioning have also provided insight into the development of psychological processes. For instance, Piagetian cogni-

tive stages in children are correlated with a sequence of bursts in brain volume (Epstein, 1974; Epstein, 1980; Thatcher, 1992) and increased density in frontal, hippocampal, cerebellum and basal ganglia cortices (Herschkowitz, Kagan, & Zilles, 1997).

Patterns of brain functioning have even helped delineate different descriptions of self-awareness, such as: *ownership* (in respect to perceptions and judgments), *agency* (in respect to actions and thoughts), *cognitive unity* (in respect to beliefs and attitudes) and *reflective self-awareness* (awareness of one's physical characteristics, behavior, personality, emotional states, or imagery) (Marshall & Fink, 2001; Vogeley, Kurthen, Falkai, & Maier, 1999). Different levels of reflective self-awareness have been associated with activation across predominately midline frontal-parietal structures. For instance, stories containing either 1st or 3rd person pronouns were found to activate the precuneus in a PET study (Ruby & Decety, 2001), and anterior cingulate in a fMRI study (Vogeley et al., 2001). The level of abstractness/concreteness of 1st person reflection (personality traits versus physical traits) activated precuneus and angular gyrus, respectively (Kjaer et al., 2001). 'Perspectivity' bodily processes contributing to one's point of view, is also reported to activate medial parietal cortices including the precuneus and angular gyrus (Taylor, 2001). Action planning also activates these structures (Ruby, Sirigu, & Decety, 2002). Other studies have reported medial frontal activation during self-referential judgments of pictures (Gusnard, Akbudak, Shulman, & Raichle, 2001) and in self-referential judgments of trait adjectives (Kelley, Macrae, Wyland, Caglar, & Inati, 2002). A meta-analysis of fMRI and PET studies also reported elevated medial parietal and prefrontal activation during "baseline" resting conditions, including simple visual fixation or eyes-closed rest, compared to active task conditions (Raichle et al., 2001). The striking similarity between neural networks associated with states of reflective self-awareness and resting baseline suggests that there are distinct brain states associated with more outward, object and task-oriented modes of processing versus more inward, self-oriented modes of processing.

This distinction between external versus internal modes of awareness is a predominant theme in cognitive development. At each stage of development, a more stable and unified internal frame of reference or

dominant focus of awareness is established, providing an increasingly comprehensive context within which information of external objects and events is processed and given meaning (Alexander et al., 1990; Kegan, 1983; Wilber, 2000).

The progressive primacy of more inner abstract levels of self-awareness with development has been characterized by Alexander et al. (1990) and Kegan (1983) as a process of “de-embedding” from a more expressed level to a more abstract level of self-awareness. [See Alexander et al., (1990) for a detailed discussion of this process.] For instance, Piaget’s stages of cognitive development can be understood as the progressive de-embedding of an individual’s sense-of-self from sensory, motor, and cognitive processes (Alexander et al., 1990). Thus, one could have a *behavioral-centered* self in which the person identifies with sensory-motor behavior: “I like to forge my own way”; or “I like to go out and experiment with new ideas.” As one de-embeds from behavior, one could have a more *cognitive-centered* self in which the person identifies with mental objects and ongoing mentation: “I’m open to new experiences.” In turn, one could become more *affect-centered*, in which one identifies more with feelings and interrelations with others and the environment: “I care deeply for other people”; or “I’m happy, caring, helpful. I like to help other people.” This progressive de-embedding of self-awareness from mental contents and processes is a natural process that is shaped by ongoing experience (Alexander et al., 1990; Travis, Tecce, & Durchholz, 2001).

This developmental process of de-embedding raises a question: Can one’s experience of sense-of-self be de-embedded from *all* mental processing? If so, then awareness would experience awareness, without the usual mental content and processing associated with daily experience.

The prevailing Western view is that an individual cannot be aware without being aware of something (James, 1962). In contrast, the subjective traditions of the East—the Vedic tradition of India (Maharishi, 1969), and the Buddhist traditions of China (Chung-Yuan, 1969) and Japan (Reps, 1955)—include formalized meditation techniques predicted to lead to the direct experience of a foundational state of self-awareness devoid of mental content. For instance, the Maitri Upanishad (Maitri Upanishad 6:19, in Upanishads, 1953) states:

When a wise man has withdrawn his mind from all things without, and when his spirit of life has peacefully left inner sensations, let him rest in peace, free from the movements of will and desire . . . Let the spirit of life surrender itself into what is called *turya*, the fourth condition of consciousness. For it has been said: There is something beyond our mind which abides in silence within our mind. It is the supreme mystery beyond thought. Let one's mind . . . rest upon that and not rest on anything else.

Over the past 40 years, a growing body of research suggests a putative fourth state of consciousness, distinct from waking, dreaming, and sleeping, that can be systematically experienced and documented with Western scientific experimentation. Physiological patterns distinguish individuals who report a state of awareness, during Transcendental Meditation practice, where the self is only aware of itself, devoid of all thoughts, feelings and perceptions (Badawi, Wallace, Orme-Johnson, & Rouzere, 1984; Farrow & Hebert, 1982; Travis & Wallace, 1997). This state, has been called "pure, self-referral consciousness" (Maharishi, 1969) to distinguish it from "object-referral consciousness" in which we experience self-awareness along with inner thoughts and feelings and/or outer objects. First-person reports of pure, self-referral consciousness define a state of awareness in which self-awareness is intact, yet there is no 'sense' of time, space, or one's body (Travis & Pearson, 2000).

Repeated experience of the fourth state of pure, self-referral consciousness alternated with customary waking activity gives rise to a new integrated brain state in which pure, self-referral consciousness or awareness coexists across the 24 hours of waking, dreaming and sleeping consciousness (Maharishi, 1969). In this new integrated state, pure self-referral consciousness is experienced as a foundational state that gives rise to ongoing experience during waking, sleeping and dreaming (Maharishi, 1969). It is analogous to the vastness of the ocean not being lost with each rising wave of daily life.

In the past decade, research has investigated individuals reporting this experience of the integration of pure, self-referral consciousness with sleeping and waking. Mason et al. (1997) reported that 11 individuals reporting this integrated experience exhibited similar levels of delta activity during slow wave sleep compared to 11 non-meditating

controls, but elevated levels of theta and alpha EEG (Mason et al., 1997). It is noteworthy that the coexistence of the EEG patterns of deep sleep (delta) and meditation (theta and alpha) was associated with the subjective experience of coexistence of deep sleep along with the continued inner awareness. In a second study, EEG and ERP patterns during eyes-open computer tasks also distinguished individuals who report this integrated state (Travis, Tecce, Arenander, & Wallace, 2002). The EEG and ERP patterns distinguishing these subjects are summarized in detail below because these same subjects participated in the research reported in this paper. An understanding of their brain-wave patterns may facilitate the interpretation of the 1st and 3rd person data reported in this paper.

1.1. Brainwave patterns discriminating subjects who report the integration of pure, self-referral consciousness with waking and sleeping states

EEG and ERP patterns were compared across three groups of individuals distinguished by their self-reported experience of the integration of pure self-referral awareness with waking and sleeping. These three groups also differed on scores of two tests of transcendental experiences—Hood's M-Scale (Hood & Ralph, 1975) and Baruss's test of Material/Transcendental Worldview (Baruss & Moore, 1992), and in years practice of Transcendental Meditation: a Non-Transcendental Meditation group, a Short-term group (7.2 years Transcendental Meditation practice), and a Long-term group (24.3 years Transcendental Meditation practice). EEG patterns were recorded during two contingent negative variation (CNV) tasks in these three groups. Both tasks contained a pair of stimuli 1.5 secs apart. CNV is the rise in the EEG baseline between the two stimuli (Walter, Cooper, Aldridge, McCallum, & Winter, 1964). CNV amplitude 200 ms before the expected stimulus, called the late CNV, reflects proactive preparatory processes, including mobilization of motor (Brunia, 1993; van Boxtel & Brunia, 1994), perceptual, cognitive, and attention resources (Tecce & Cattanach, 1993).

The first task was a simple CNV task—asterisk/ tone/ button-press to stop the tone. The second task was a choice CNV task—two numbers were sequentially presented, 1.5 secs apart. Subjects responded with a left/right button press to indicate which number was larger. Three

brainwave measures calculated during the choice CNV trials distinguished individuals who reported the integration of pure self-referral awareness with waking and sleeping. These measures were: (1) higher broadband frontal EEG coherence, (2) higher alpha and lower gamma power, and (3) a better match of the timing and magnitude of CNV with task demands.

1.1.1 Broadband (8–45 Hz) frontal coherence tasks

Broadband frontal task EEG coherence was highest in the Long-term group (Travis et al., 2002). The Non-Transcendental Meditation group had lowest task coherence, and the Short-Term group exhibited intermediate values of coherence. The frontal cortices, which are reciprocally connected with nearly all other cortical, subcortical, and brainstem structures (Fuster, 1993), are important circuits for emotion regulation (Davidson, 2002), moral reasoning (Moll et al., 2002; Moll et al., 2001), decision making and planning (Fuster, 1993, 2000), and self-concept (Ben Shalom, 2000; Vogeley et al., 1999). Broadband coherence, in contrast to narrow band coherence such as theta or alpha, may reflect large-scale cortical integration thought necessary for the unity of subjective experience (Varela, Lachaux, Rodriguez, & Martinerie, 2001). Broadband frontal coherence observed in subjects reporting this integrated state may characterize the large-scale neural integration necessary to support the coexistence of pure, self-referral consciousness with waking and sleeping experience.

1.1.2. Increased alpha and decreased gamma power

The pattern of peak power estimates during tasks also discriminated these subjects (Travis et al., 2002). Alpha (8–10 Hz) EEG can be associated with long-range, top-down processes, while gamma (25–55 Hz) EEG is associated with local, bottom-up, sensory processing (von Stein & Sarnthein, 2000). During tasks, the Long-term group had higher alpha power and lower gamma power than the other two groups. This high alpha/gamma ratio in Long-term Transcendental Meditation subjects suggests that they may process information differently: Inner self-awareness may play a greater role in cognitive processing.

1.1.3. *Different CNV patterns*

The CNV patterns in the three groups support the proposition that the Long-term subjects processed tasks differently. CNV in the Long-term group better suited the task demands.

In the Long-term group, late CNV was higher during simple trials, when subjects knew the correct response before the second stimulus. In the simple trials, it would be appropriate to initiate preparatory responses before the second stimulus. In contrast, the Long-term group's CNV was lower during choice trials, when they had not yet seen the second number and so did not have enough information to decide whether a left or right response would be appropriate. The reverse pattern was observed in the Non-Transcendental Meditation group. In the choice trials, the Non-Transcendental Meditation subjects activated brain response processes before they had sufficient information to determine the correct response, i.e., before they saw the second number.

Frontal and central cortical areas participate in generating the CNV waveform (Tecce & Cattanach, 1993). Appropriate timing of CNV activation suggests more appropriate timing of frontal executive processes in the Long-term Transcendental Meditation subjects. This CNV finding complements the finding of higher levels of frontal EEG coherence during tasks in these subjects. Thus, frontal areas, whose functioning is critical for generating levels of self-awareness (Hobson & Pace-Schott, 2002; Vogeley et al., 1999) appear to function differently in these three groups. As a consequence, one might expect significant differences in the inner experience of sense-of-self in the Long-term Transcendental Meditation subjects.

1.2. *Purpose of the current study*

The current study extends these earlier brainwave findings by exploring the details of the inner subjective experience of these subjects through two approaches—an unstructured interview and a battery of standard psychological tests. The 1st person phenomenological reports and psychological tests used in this research explore possible dimensions of inner experience to complement the previously reported brain measures. Taken together, the qualitative and quantitative measures are used to delineate an *Object referral/Self-referral Continuum* of self-awareness that links ordinary descriptions of identity in which the outer, objective

worldview predominates in one's sense-of-self, with so-called experience of higher states of consciousness, in which pure, self-referral consciousness is the predominant aspect of experience (Alexander et al., 1990).

2. Experiment 1: Exploring inner experience through unstructured interviews

This experiment explores 1st person, phenomenological reports of self-awareness as revealed in unstructured interviews and analyzed using Atlas-ti content analysis software. We hypothesize that the analysis will yield dimensions of experience that distinguish the three groups.

2.1. Method

2.1.1. Subjects

The 51 subjects in this research comprised three groups based on degree of self-reported experiences of pure, self-referral consciousness during activity. The *Non-Transcendental Meditation* group ($N = 17$, age = 39.7 ± 11.5 years) did not practice a meditation technique and rarely if ever reported the experience of pure self-referral consciousness. The *Short-Term Transcendental Meditation* group ($N = 17$; age = 42.5 ± 11.5 years) had practiced the Transcendental Meditation technique for about eight years (7.8 ± 3.0 years), and reported pure self-referral consciousness experiences during Transcendental Meditation but only occasionally during daily life. The *Long-term Transcendental Meditation* group ($N = 17$; age = 46.5 ± 7.0 years) had practiced Transcendental Meditation for about 25 years (24.5 ± 1.2 years) and reported the continuous experience of pure self-referral consciousness throughout daily life. (The age differences between groups were not statistically significant, $F(2; 48) = 1.90$, $p = .160$.) Each group comprised eight females, and nine males.

The subjects were part of the larger Fairfield, Iowa, community. Subjects in the two Transcendental Meditation groups responded to signs on campus inviting people to participate in a study on the benefits of Transcendental Meditation practice. Individuals in the Non-Transcendental Meditation group comprised students at Maharishi University of Management who intended, but had not yet learned Transcendental Meditation. All subjects were right-handed by self report. Table 1 rep-

resents these subjects’ demographics.¹ As seen in this table, subjects in each group spanned levels of education (high school to graduate training) and vocation. The “Professionals” category included architects, engineers, lawyers, researchers, computer professionals, pharmacists, and university administrators and faculty. These were combined into the “Professionals” category to simplify this table.

Table 1. Education levels and vocation of the subjects		
Group	Education	Vocation
Non-TM	2 High school	2 Artisans
	9 Some College	2 Military
	6 Graduate/Professional	4 Business and management
		7 Professionals
Short-Term TM		2 Students
	9 Some College	7 Business and management
	8 Graduate/Professional	9 Professionals
		1 Student
Long-Term TM	4 Some College	2 Artisans
	13 Graduate/Professional	4 Business and management
		11 Professionals

Subjects were in good health with no history of serious accidents, hospitalization, or psychiatric diseases that would affect their EEG. They were free of prescription or non-prescription drugs. Informed consent was obtained before the testing, and the University Institutional Review Board approved the experimental protocol.

¹ Data are reported as mean ± SD.

We used individuals who practiced the Transcendental Meditation technique for three reasons. First, the Transcendental Meditation technique explicitly leads to self-awareness de-embedded from perception, thoughts and feelings, through an effortless process called transcending, which culminates in the experience of pure, self-referral consciousness—awareness without mental content, referred to as pure, self-referral consciousness (Maharishi, 1969). In contrast, many other meditations have different goals and involve more object-referral, mind/body techniques, without reports of pure, self-referral consciousness. For instance, Qigong involves moving “Qi” to different parts of the body by attending to an area of the physiology while controlling inhalation and exhalation (Lim, Boone, Flarity, & Thompson, 1993); Vipassana meditation involves attention on the breath during eyes-closed meditation, and on the dispassionate, non-manipulative observation of ongoing perceptual, bodily and/or mental states during eyes-open tasks (Buchheld, Grossman, & Walach, 2001); and Yoga Nidra meditation involves visualization of various mental and bodily states (Lazar et al., 2000; Lou et al., 1999). Second, Transcendental Meditation subjects in the community around the University report the experience of the integration of pure consciousness with waking, dreaming and sleeping, providing adequate number of subjects for this study. Third, using subjects practicing the same meditation technique provides a relatively homogenous ‘meditating’ population along with a common vocabulary to describe experiences. Although Transcendental Meditation subjects were used in this study, the research paradigm can be used to explore meditation and spiritual experiences across meditation and religious traditions.

2.1.2. Procedure

Following EEG recording during computer tasks, reported in Travis et al., (2002), subjects were asked three questions in a tape-recorded unstructured interview. (1) “Please describe experiences during the CNV tasks.” (2) “Please describe experiences during sleep.” And (3) “Please describe yourself.” Questions were always in this order. The first two questions allowed the interviewer to gain rapport with the subjects. The third question was used for this analysis. During the interview, the interviewer asked the person to explain any comment

that did not seem obvious. For instance, when one person said: "I think I'm not as happy as I used to be," the interviewer asked: "You used to be . . . does that mean two years ago or 10 years ago?" Or the interviewer asked: "You talk about connectedness; could you expand on that concept?" The interview ended when the person had no further comments to make. These taped interviews were transcribed for later analysis.

2.1.3. *Data analysis*

2.1.3.1. *Content analysis of interviews*

The audiotaped interviews were transcribed, and were content analyzed using Atlas-ti software (Scientific Solution Development, 2002). Atlas-ti is an interactive software program. A section of transcribed text is opened in an Atlas-ti window. The experimenter reads the text and manually highlights phrases or sentences that contain a single idea. For instance, "I believe anything is possible." With a mouse click, the highlighted section is added to Atlas-ti's lists of "quotations" for that group. After going through the entire text, the experimenter begins with the first quotation and generates a single word or phrase that encapsulates the unit of meaning in that quotation.

In Atlas-ti these are called "codes." The codes are connected to the quotations in Atlas-ti so that double-clicking any code brings up all quotations connected with it. These codes were not generated beforehand, but were generated from the data itself. This "grounded theory" approach (Sommer, 1991) was used to discover dimensions of the experience of the integration of pure consciousness with waking, sleeping and dreaming. Next the experimenter structured codes into hierarchical networks within subjects to create a picture of their inner world of meaning. For instance, in the *Non-Transcendental Meditation* group the networks centered on the descriptions (codes) of the self as a: (1) belief system, (2) cognitive style, (3) feelings, and (4) social roles. These networks were then assigned a supercode. In the example of the *Non-Transcendental Meditation* group, the supercode was: "Self is identified with thoughts, feelings and actions."

Table 2. Means and SD of average number of words, quotations, total codes and the supercode for each group from the content analysis				
Group	Average word count	Average quotations	Total codes	Supercodes
Non - TM	554 ± 459	905 ± 5.0	57	Self is <i>identified</i> with thoughts, feelings, and actions.
Short-Term	850 ± 760	9.3 ± 3.2	56	Self is the <i>director</i> of thoughts, feelings, and actions.
Long-Term	1156 ± 1180	10.1 ± 6.2	59	Self is <i>underlying and independent of</i> thoughts, feelings, and actions.

2.2. Results

The responses to the question, "Describe yourself," were analyzed and are reported. Table 2 presents a summary of the content analysis. This table reports average total words in each interview, average number of quotations selected from each interview, total codes for each group and the resulting supercode. Total codes are reported because the same code often summarized quotations from different subjects in each group.

The interviews varied in number of words. However, this difference was not statistically significant [$F(2, 48) = 2.07, p = .108$] due to high variability within groups. The average number of quotations and total codes were very similar between groups.

The supercodes for the three groups are presented in Table 3, along with sample quotations. This gives the reader a sense of the responses of subjects in each group that generated the final supercodes.

The supercodes derived from the Atlas-ti content analysis delineated three quite different descriptions of self-awareness in healthy adults. As seen in Table 3, the Non-Transcendental Meditation group, who rarely, if ever, reported the experience of pure, self-referral consciousness, described themselves predominantly in terms of their thoughts and feelings and behavior: *"I guess I'm open to new experiences..."* or *"I tend to appreciate those things that are different..."* or *"I kind of like to forge my own way."* This group described their sense of self as predominantly identified with their thoughts, feelings, and actions.

Individuals in the Short-term group, with infrequent experiences of pure, self-referral consciousness during daily life, described themselves predominantly as that which directed thoughts, feelings, and actions. While their sense-of-self was less object-referral, it was still in terms of active processing. *"I'm my awareness. My ability to perceive and be aware,"* or *"I'm my own capabilities; my ability to learn."*

Individuals in the Long-term group, who reported the continuous experience of pure, self-referral consciousness coexisting with waking and sleeping activity, described themselves as underlying and independent of thoughts, feelings and actions. This group recognized space-time boundaries. For instance, *"And in certain contexts that has some value, like when I tell my wife, I'm going to bed now."* However, they predominantly described themselves as existing outside of space-time causation—*"my self is immeasurably vast. . . on a physical level"; "all-pervading"; "beyond speech";* or *"My self doesn't stop where I stop."*

Table 3. Results of content analysis: Supercodes and sample responses from the three groups	
Group and supercode	Sample responses/quotations
<i>Non-TM group</i> : Self is identified with thoughts, feelings, and actions	<p>N1: I guess I'm open to new experiences, and I tend to appreciate those things that are different.</p> <p>N2: I kind of like to forge my own way.</p> <p>N3: I am open to change and new ideas . . . I'm an adventuress. I like to go out . . . and experiment with new ideas.</p> <p>N4: I tend to appreciate those things that are different, even in my style of dress. I like something usually because it's odd or strange or something that other people absolutely wouldn't wear.</p> <p>N5: I'm happy, caring, helpful, I like people who like to help other people; I hate seeing anyone in trouble.</p> <p>S1: I'm my own awareness. My ability to perceive and be aware. I'm my own potential, my own power.</p> <p>S2: I'm my own capabilities, my ability to learn; my ability to do things . . . in it's essential nature—my ability to act.</p> <p>S3: There are many different levels to who I am. I'm a sister, a daughter, a friend, an athlete, a nature lover, a seeker of the truth. I'm a very spiritual person. I believe that I can do and accomplish anything that I set my mind to.</p> <p>S4: I am a little bit more silent, more reserved, and thoughtful than most, with a deep desire to just succeed in all activities and at the same time to develop spiritually very quickly.</p> <p>S5: Who I am is who I am inside. How I think. What I believe. How I feel. How I react.</p>
<i>Short-Term group</i> : Self is the director of thoughts, feelings, and actions.	

<i>Long-Term group:</i> Self is independent of and underlying thoughts, feelings, and actions.	<i>L1:</i> We ordinarily think my self as this age; this color of hair; these hobbies . . . my experience is that my Self is a lot larger than that. It's immeasurably vast . . . on a physical level. It is not just restricted to this physical environment.
	<i>L2:</i> It's the "I am-ness." It's my Being. There's just a channel underneath that's just underlying everything. It's my essence there and it just doesn't stop where I stop . . . by "I." I mean this 5 ft. 2 person that moves around here and there.
	<i>L3:</i> I look out and see this beautiful divine Intelligence . . . you could say in the sky, in the tree, but really being expressed through these things . . . and these are my Self.
	<i>L4:</i> I experience myself as being without edges or content . . . beyond the universe . . . all-pervading, and being absolutely thrilled absolutely delighted with every motion that my body makes. With everything that my eyes see, my ears hear, my nose smells. There's a delight in the sense that I am able to penetrate that. My consciousness, my intelligence pervades everything I see, feel, and think.
	<i>L5:</i> When I say "I" that's the Self. There's a quality that is so pervasive about the Self that I'm quite sure that the "I" is the same "I" as everyone else's "I." Not in terms of what follows right after. I am tall. I am short, I am fat, I am this, I am that. But the "I" part. The "I am" part is the same "I am" for you and me.

Table 4. Table of number of subjects in each group in each of the three supercode categories that emerged from the content analysis			
Sense-of-self	Non-TM Group	Short-Term Group	Long-Term Group
... <i>Identified</i> with Thoughts, Feelings, and Actions	17	3	0
... <i>Director</i> of Thoughts, Feelings, and Actions	0	14	0
... <i>Independent and Underlying</i> Thoughts, Feelings, and Actions	0	0	17

Table 4 presents the number of subjects in each group (columns) who fell in the three supercode categories (rows). As seen in this figure, all subjects in the first group (Non-Transcendental Meditation group) described themselves in terms of feelings, thoughts and actions. Subjects in the second group (Short-Term group) described themselves in terms of the first two categories. Subjects in the last group (Long-term group) described themselves in terms of an independent, underlying reality.

2.3. Discussion

Qualitative research is valuable for: (1) elucidating the inner world of meaning for subject groups, and (2) generating hypothesis rather than testing hypothesis (Shadich, Cook, & Campbell, 2002). The interview of these subjects revealed fundamentally different descriptions of self-awareness. Subjects in the Non-Transcendental Meditation group described themselves predominantly in terms of how they interacted with the world. That is, the self was “embedded” in or identified with the processes by which they experienced the world. This could be characterized as an *object-referral* style. One *is* what one *does*. Subjects in the Short-Term group described themselves as *directing* thinking and behavior—the first stages of the self “de-embedding” or separating from the processes of thinking and behavior. “*I’m my own capabilities; my ability to learn.*” And another: “*I am my ability to perceive and be aware.*” Yet, these subjects still described themselves primarily in terms of what they did. In contrast, subjects in the Long-Term group described themselves as separate from what they were thinking or doing—their identities, their selves were completely “de-embedded” from the processes of thinking and behavior.

“*My self is immeasurably vast . . . on a physical level. Not just restricted to this physical environment.*” And another: “*It’s my Being. There’s just a channel underneath that’s just underlying everything. It’s my essence there and it just doesn’t stop where I stop.*” This sense of expanded self-awareness is sometimes written with a capital “S”—“Self”—to differentiate it from the objective-referral experience of being identified with mental or perceptual objects. This style of functioning could thus be termed *Self-referral*. In this state, the Self has its own status. It is defined in terms of its own structure, independent of objects and processes of knowing.

2.3.1. Limitations of Interview data

There are admittedly many threats to internal validity in an open-ended interview design. Foremost, the findings from the interviews could reflect, in part, experimenter bias. The Long-Term subjects’ descriptions of self-awareness were so different from the other two groups, it was not possible for the interviewer to remain blind to group membership during the interview. However, the interviewer did not use probe questions that could have been selectively used to lead the subject to bring

out a specific point. Rather, the interview unfolded as a conversation, with the interviewer only asking for clarification of any statements. In addition, the distinction between groups from the content analysis is supported by significant group differences in blind scored standardized psychological tests—results in the next experiment. Also, these groups were distinguished by EEG patterns during tasks as presented in our previous work (Travis et al., 2002). Therefore, experimenter bias did not appear to greatly influence results.

Another possible confound is subject reactivity. Did the content analysis simply reveal “well-learned convictions” in these subjects? Again, a close inspection of the data suggests that there was minimal effect of subject reactivity. Both Transcendental Meditation groups had been meditating for some time. The so-called Short-Term group in this study had been meditating for an average of 7 years. That is time enough to learn all the “right” answers. However, not having the experience of the integration of pure consciousness with waking and sleeping, the Short-Term subjects were not able to actually describe that integrated experience. They were not able to discuss fine details of the integration of pure consciousness with waking. Rather, subjects simply expressed what predominated in their daily experience. This conclusion is supported by the lack of significant group differences between the lengths of the interviews, and the number of quotations and codes resulting from the content analysis. This suggests that individuals in each group described their experience to similar degrees. What differed was the actual nature of their personal experience.

2.4. Conclusion to Experiment 1

One strength of qualitative interview data is the ability to generate hypotheses. The content analysis of these interview data revealed a continuum of self-awareness that ranged from *Object-referral* awareness (being embedded in or identified with feelings, thinking and action) to *Self-referral* awareness (a greatly expanded sense-of-self de-embedded from or independent of all thinking, feeling and action). A proposed Object-referral/Self-referral Continuum of self-awareness is presented in the Section 4, which summarizes the qualitative findings from this experiment, the results from the psychological tests in the next experiment, and the brainwave findings from our previous work, which were

summarized in the introduction. In addition, the statements from this content analysis could be used to create a pencil-and-paper Likert Scale that may assess inner experiences along the proposed Object-referral/Self-referral Continuum.

3. Experiment 2: Exploring inner experience through psychological tests

This second experiment used standardized tests of psychological health to further investigate the nature of self-awareness in these subjects.

3.1. Method

3.1.1. Subjects and procedure

The 51 subjects in the original study were re-contacted. EEG recordings and interview data were already collected on these subjects as part of the earlier study. Subjects were mailed four pencil-and-paper instruments measuring personality, inner/outer orientation, moral reasoning, and anxiety, as described below. The mailing was followed up by phone calls to confirm receipt and participation. Individuals returned their tests by mail in an enclosed self-addressed stamped envelope.

Twenty-nine subjects in the original sample were successfully re-contacted and returned forms. There were 15 males and 14 females in this sample, with a mean age of 38.5 years, ranging from 17 to 58 years of age. This sample included 9 from the Non-Transcendental Meditation group, 9 from the Short-Term group, and 11 from the Long-Term group. This subset of the original population should provide sufficient range and variability in subjective experience and in brain-patterns to yield reliable correlation coefficients (Hair, Anderson, Tatham, & Black, 1992).

3.1.2. Test Instruments

3.1.2.1. Inner/outer orientation

Baruss developed this scale to quantify a subject's worldview along an outer/inner, material/transcendental dimension (Baruss & Moore, 1992). Subjects are given 38 statements like: "My spiritual beliefs

determine my approach to life.” Subjects respond on a 7-point Likert Scale. This instrument has high item-total correlations ($r = .56 - .62$) and high Cronbach α coefficients ($r = .82 - .95$) (Baruss & Moore, 1992). Scores on this scale correlate highly with positive inner growth and meaningfulness of life (Baruss & Moore, 1992). This scale yields a single number, which ranges from -114 (materialistic: “conceptualizing consciousness in terms of information processing”) to +114 (transcendental: “emphasize subjective features of consciousness and declare its ontological primacy”).

3.1.2.2. *Moral reasoning*

Gibbs’s Socio-Moral Reflection Measure-Short Form (SMR-SF) presents moral statements and asks subjects to describe *why* a moral act may be important to them. For instance: “Keeping promises is important because. . .”; or “Helping one’s friend is important because. . .” Gibbs has written an extensive reference manual to aid in categorizing responses into moral maturity levels (Gibbs, Basinger, & Fuller, 1992).

The SMR-SF can be group administered as a pencil-and-paper test, takes 15–20 mins to complete, and can be scored in 25 mins. In addition, a scorer can gain competency in 25–30 h of self-study. Gibbs’s SMR-SF has high test-retest reliability ($r = .88$), and high Cronbach α coefficients ($r = .92$). Scores on the SMR-SF are highly correlated with scores on Kohlberg’s Moral Judgment Interview ($r = .70$) (Gibbs et al., 1992), which is much more intensive to administer and to score.

Levels of moral reasoning range from surface considerations to an inner autonomous basis for decision-making. More abstract levels of moral reasoning emerge developmentally and parallel growth in cognitive development, and in ego development (Gibbs et al., 1992).

3.1.2.3. *Anxiety levels*

Spielberger’s State/Trait Anxiety Inventory (STAI) assesses both transitory feelings of anxiety (state anxiety) and chronic feelings of anxiety (trait anxiety). High trait anxiety levels are considered a general risk for psychological and physiological disease, perhaps due to the impact of distress on immune response (Friedman & Booth-Kewley, 1987; Watson & Clark, 1984) and brain function (Graef, 2003).

3.1.2.4. *Personality*

The International Personality Item Pool (IPIP) was used to measure personality. The IPIP is the result of an international effort to develop and continually refine a set of personality inventories, whose items are in the public domain, and whose scales can be used for both scientific and commercial purposes. The IPIP items are freely available on the Internet (<http://ipip.ori.org/ipip/>). This website also provides sub-scales and their correlations with proprietary instruments such as the Minnesota Multiphasic Personality Inventory or the California Personality Inventory.

We used 100 items in the IPIP that index the five personality constructs in the “Big Five” model of personality: extraversion, agreeableness, conscientiousness, emotional stability, and openness to experience (Goldberg, 1992). *Extraversion* represents the tendency to be social, assertive and active, including the two dimensions of dominance and sociability; *Agreeableness* is the tendency to be trusting, caring and gentle; *Conscientiousness* includes achievement and dependability; *Emotional Stability* includes good emotional adjustment, high self-esteem, low anxiety, and high security and easiness with others; and *Openness to experience* is the disposition to be imaginative, nonconforming and unconventional (Judge, Bono, Ilies, & Gerhardt, 2002; Judge & Ilies, 2002). Consensus is emerging that this five-factor model of personality may describe the most salient aspects of personality (Goldberg, 1990).

3.1.3. *Data analysis: scoring of psychological tests*

The tests of inner/outer orientation, state/trait anxiety, and personality were scored using standard templates. Gibbs’s moral reasoning protocols were sent to trained scorers. The scorers met the requirements for reliability in scoring, set forth in Appendices B and C in Gibbs’s manual, (Gibbs et al., 1992).

3.2. *Results*

Following the recommendations in *Psychophysiology* (Jennings, Cohen, Ruchkin, & Fridlund, 1987; Keselman, 1998), a between MANOVA was used to test for group differences. In this analysis, group was the between factor and scores on the psychological tests were the variates. For this analysis, anxiety was reversed scored so that a high value was associated with lower anxiety levels. In this MANOVA, significant

omnibus group differences were found [Wilk's Lambda $F(18, 36) = 36.0, p = .044$]. Based on the significant F-test, individual ANOVAs were calculated to test for significant group differences on each test. Table 5 presents the means (SD) for the psychological tests for the three groups as well as the F and p values from the ANOVAs. Highly significant p -values are in bold. As seen in this table, the most significant group differences were seen in inner orientation, moral reasoning, state and trait anxiety, and one component of the IPIP, emotional stability.

A Pearson Correlation analysis showed that the psychological measures were highly intercorrelated (all $r > .5$). To model the variance in the test scores, a principle component analysis (PCA) was conducted. Conscientiousness was not entered in this analysis because there were no significant group differences on this variable, and so this variable may not be sensitive to differences in inner experiences. The first unrotated component of the PCA has a long tradition in intelligence research as a measure of general intelligence or "g"—a construct theorized to underlie performance across a range of reasoning and problem solving tests (Jensen, 1980; Spearman, 1904). In the current study, the first principal component of the unrotated PCA of psychological tests may represent a general measure of sense-of-self, a basic quality of self-consciousness or life-orientation. Table 6 contains the factor loadings for the first and second unrotated components, which accounted for 69% of the variance in test scores. The other components had eigen values less than 1.

All variables from the psychological tests were converted to z-scores, weighted by their factor loadings on the 1st unrotated component, and summed. This sum was called a *Consciousness Factor*, because it was theorized to reflect a basic quality of consciousness or life-orientation common to measures of psychological health and personality. An ANOVA was used to test for main effects for group on the Consciousness Factor scores. This analysis yielded significant main effects for group, $F(2, 26) = 13.2, p < .0001$: *Non-Transcendental Meditation*: 4.78 ± 1.2 ; *Short-Term*: 0.40 ± 1.2 ; *Long-Term*: 3.59 ± 1.1 . Individual comparisons revealed that Consciousness Factor scores for the Short-Term subjects were significantly higher (two-tailed) than those of the *Non-Transcendental Meditation* subjects [$t(28) = 3.03, p = .006$], and there was a trend for Long-Term subjects to be higher than those for the Short-Term Subjects [$t(28) = 1.96, p = .062$].

Table 5. Means (SD), F statistics, and p-values for the psychological tests					
Test	Non-TM	Short-Term	Long-Term	F stat (2.26)	p value
Inner/outer orientation	60.2(23.8)	70.0(12.4)	84.4(3.9)	9.03	.001
Moral reasoning	3.1(0.4)	3.4(0.4)	3.7(0.2)	5.69	.009
State anxiety	35.9(15.2)	27.1(9.1)	22.3(2.4)	7.66	.002
Trait anxiety	40.2(15.5)	30.6(7.6)	24.6(4.0)	7.90	.002
IPIP: Extraversion	3.1(0.6)	3.4(0.5)	4.1(0.8)	4.48	.021
IPIP: Agreeableness	4.0(0.5)	4.2(0.4)	4.6(0.4)	3.98	.031
IPIP: Conscientiousness	3.6(0.7)	3.9(0.8)	4.2(0.4)	2.28	ns
IPIP: Emotional stability	3.3(1.0)	3.8(0.8)	4.4(0.4)	10.64	.0004
IPIP: Openness to experience	4.0(0.4)	4.5(0.4)	4.7(0.4)	3.64	.040

Table 6. Variable loadings of the 1st and 2nd unrotated components of the PCA		
Variable	1st Unrotated component	2nd Unrotated component
Inner/outer orientation	.71	-.48
Moral reasoning	.64	-.30
State anxiety	-.86	.19
Trait anxiety	-.87	.12
Extraversion	.77	.50
Agreeableness	.77	.46
Emotional stability	.88	-.11
Openness to experience	.77	.34
Variance accounted for	58%	12%

3.3. Discussion

The Consciousness Factor, which represents a common dimension across several tests of psychological health and personality, accounted for over half the variance among groups. As “*g*” represents a common dimension among all intelligence tests (Spearman, 1904), so the Consciousness Factor may represent a common dimension among measures of psychological health and personality. This infers that one’s sense-of-self, as operationalized as scores on the Consciousness Factor, may be an important determinant of health as well as personal identity. In light of the phenomenological data in Experiment 1, higher scores on the Consciousness Factor may represent increasing ‘de-embedding’ of sense-of-self from mental processes and behavior.

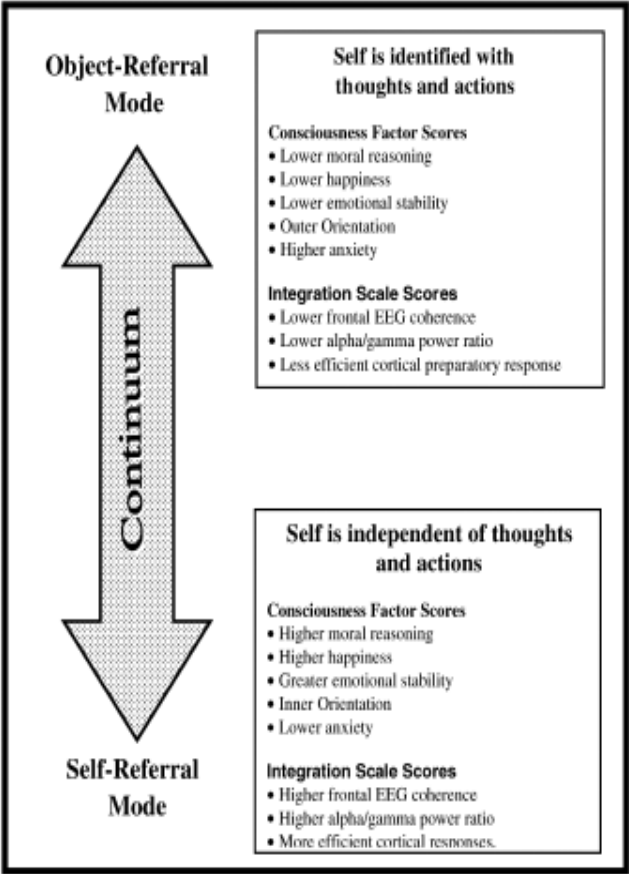


Fig. 1. Schematic representation of sense-of-self along an object referral/self-referral continuum. The range of descriptions of sense-of-self extended from *Object-referral to Self-referral* predominant modes. The two boxes on the right present the supercode from the phenomenological first person reports, and the psychological (Consciousness Factor scores) and physiological (brain-based Integration Scale scores) correlates of the ends of the proposed continuum.

4. General discussion

These three groups of subjects showed significant differences on: first person descriptions of self-awareness, Consciousness-Factor scores, and brainwave patterns during tasks (from our previous work). These three measures may define a range of sense-of-self along an Object-referral/

Self-referral Continuum (see Fig. 1). The two boxes on the right of Fig. 1 present the supercode from the phenomenological first-person reports, and the psychological (Consciousness Factor) and physiological (brain-based Integration Scale) correlates of the ends of the proposed continuum.

In general, the development of self-awareness can be understood along this continuum as the progressive de-embedding of the knower or Self from the objects and processes of knowing—thoughts, feelings, and actions. As one de-embeds from cognitive and behavioral process or moves toward the Self-referral end of this continuum an integrated set of mind/body measures appear: scores on the Consciousness Factor increased, as reported in this study, frontal EEG 6–40 Hz coherence increased during tasks, alpha power increased and gamma power decreased during tasks, and there was a better match between task demands and brain preparatory responses as measured by contingent negative variation (CNV), as reported in previous work (Travis et al., 2002).

These subjective and objective findings may characterize the process of self “de-embedding” from thinking, feeling and behavior. We suggest these expressions of brain and sense-of-self represent a normal extension of human development.

This extension of human development can be understood in terms of a movie-metaphor. Watching a movie, most individuals are “lost” in the movie. The movie is real. Emotions and thoughts are dictated by the ever-changing sequence of the film. This is a predominantly object-referral state. The meditative experience of transcending—the repeated experience of pure, self-referral consciousness—alters this common movie-going experience. Subjectively, the individual begins to “wake up” to his/her own inner status. Although continuing to enjoy the movie, he/she gradually becomes aware that they exist independent from the movie. They experience a value of “witnessing” the activity around them. To these individuals, the ever-changing movie frames are a secondary part of experience because these frames are always changing. The most salient part of their every experience is pure, self-awareness. What is ‘real’ shifts with time from the movie to self-awareness, from the thoughts, feelings and actions to the Self, from object-referral to self-referral awareness.

The reported experience of stable states of self-awareness de-embedded from, but coexisting with, the processes of waking, sleeping or dreaming is traditionally termed “Cosmic Consciousness” or “enlightenment” (Maharishi, 1969; Shear & Jevning, 1999). This state has been described in many traditions (Bucke, 1991). Though many scientifically minded people may consider enlightenment either imaginary, impractical, or simply outside the boundaries of scientific investigation, the implication of these data is that enlightenment may be operationalized. Laboratory experimentation can help us make progress in this arena as seen by responses during unstructured interviews, supported by factor analysis of scores on psychological tests and brainwave patterns during tasks.

In conclusion, these qualitative data along with previously reported brainwave patterns suggest a range of fundamentally different values of one’s identity or sense-of-self. Meditative traditions predict the possibility of experiencing various ends of an object-referral/self-referral continuum of self-awareness. Modern neuroscience research, especially increasingly more sophisticated whole brain scanning techniques, are now beginning to map out the brain states associated with unique states of self-awareness, both in meditation and in activity (Newberg & Iversen, 2003). Future longitudinal research can investigate the outcomes of different meditation and spiritual traditions using these and other qualitative and quantitative mind/body measures. This line of research could dramatically impact our understanding of the possible range of human development, and could help promote a more unified understanding of diverse spiritual traditions as different roads to the same goal—a more extensive development of human brain integration and unfoldment of our full human potential.

References

- Alexander, C., Davies, J., Dixon, C. A., Dillbeck, M., Druker, S., Oetzel, R. M., Muehlman, J. M., & Orme-Johnson, D. (1990). Growth of higher stages of consciousness: Maharishi vedic psychology of human development. In C. Alexander & E. Langer (Eds.), *Higher stages of human development* (pp. 259–341). New York: Oxford University Press.
- Badawi, K., Wallace, R. K., Orme-Johnson, D., & Rouzere, A. M. (1984). Electrophysiologic characteristics of respiratory suspension periods occurring during the practice of the Transcendental Meditation Program. *Psychosomatic Medicine*, 46(3), 267–276.
- Baruss, I., & Moore, R. J. (1992). Measurement of beliefs about consciousness and reality. *Psychology Reports*, 71, 59–64.
- Ben Shalom, D. (2000). Developmental depersonalization: The prefrontal cortex and self-functions in autism. *Consciousness and Cognition*, 9, 457–460.
- Brunia, C. H. M. (1993). Waiting in readiness: Gating in attention and motor preparation. *Psychophysiology*, 30, 327–339.
- Buchheld, N., Grossman, P., & Walach, H. (2001). Measuring mindfulness in insight meditation (Vipassana) and meditation-based psychotherapy. *Journal for Meditation and Meditation Research*, 1(1), 10–33.
- Bucke, R. M. (1991). *Cosmic consciousness*. New York: E.P. Dutton.
- Chayer, C., & Freedman, M. (2001). *Frontal lobe functions*, 1(6), 547–552.
- Davidson, R. J. (2002). Anxiety and affective style: Role of prefrontal cortex and amygdala. *Biological Psychiatry*, 51(1), 68–80.
- Davidson, R. J., Pizzagalli, D., Nitschke, J. B., & Putnam, K. (2002). Depression: Perspectives from affective neuroscience. *Annual Review of Psychology*, 53.
- Epstein, H. T. (1974). Phrenoblysis; special brain and mind growth periods. *Developmental Psychobiology*, 7, 217–288.
- Epstein, H. T. (1980). EEG developmental stages. *Developmental Psychobiology*, 13, 629–631.
- Farrow, J. T., & Hebert, J. R. (1982). Breath suspension during the transcendental meditation technique. *Psychosomatic Medicine*, 44(2), 133–153.

- Friedman, H. S., & Booth-Kewley, S. (1987). The disease-prone personality: A meta-analytic view of the construct. *American Psychologist*, 42, 539–555.
- Fuster, J. M. (1993). Frontal lobes. *Current Opinion in Neurobiology*, 3(2), 160–165.
- Fuster, J. M. (2000). Executive frontal functions. *Experimental Brain Research. Experimentelle Hirnforschung. Experimentation cerebrale*, 133(1), 66–70.
- Gibbs, J. C., Basinger, K. S., & Fuller, D. (1992). *Moral maturity*. Hillsdale, NJ: Erlbaum.
- Goldberg, L. R. (1990). An alternative “Description of personality”: The Big-Five factor structure. *Journal of Personality and Social Psychology*, 59, 1216–1229.
- Goldberg, L. R. (1992). The development of markers for the Big-Five factor structure. *Psychological Assessment*, 4, 26–42.
- Graef, F. G. (2003). Biological basis of posttraumatic stress disorder. *Revista Brasileira de Psiquiatria*, 25, 21–24.
- Gur, R. C., Schroeder, L., Turner, T., McGrath, C., Chan, R. M., Turetsky, B. I., Alsop, D., Maldjian, J., & Gur, R. E. (2002). Brain activation during facial emotion processing. *NeuroImage*, 16(3, Pt. 1), 651–662.
- Gusnard, D. A., Akbudak, E., Shulman, G. L., & Raichle, M. E. (2001). Medial prefrontal cortex and self-referential mental activity: Relation to a default mode of brain function. *Proceedings of the National Academy of Sciences of the United States of America*, 98(7), 4259–4264.
- Hair, J. F., Anderson, R. E., Tatham, R. L., & Black, W. C. (1992). *Multivariate data analysis*. New York: Macmillan Publishing Co.
- Herschkowitz, N., Kagan, J., & Zilles, K. (1997). Neurobiological bases of behavioral development in the first year. *Neuropediatrics*, 28(6), 296–306.
- Hobson, J. A., & Pace-Schott, E. F. (2002). The cognitive neuroscience of sleep: Neuronal systems, consciousness and learning. *Nature Review of Neuroscience*, 3, 679–693.
- Hood, J., & Ralph, W. (1975). The construction and preliminary validation of a measure of reported mystical experience. *Journal for the Scientific Study of Religion*, 14, 29–41.

- James, W. (1962). *Psychology: Briefer course*. New York: Collier Books.
- Jennings, J. R., Cohen, M. J., Ruchkin, D. S., & Fridlund, A. J. (1987). Editorial policy on analyses of variance with repeated measures. *Psychophysiology*, 24, 474–478.
- Jensen, A. R. (1980). *Bias in mental testing*. New York: The Free Press.
- Judge, T. A., Bono, J. E., Ilies, R., & Gerhardt, M. W. (2002). Personality and leadership: A qualitative and quantitative review. *Journal of Applied Psychology*, 87(4), 765–780.
- Judge, T. A., & Ilies, R. (2002). Relationship of personality to performance motivation: A meta-analytic review. *Journal of Applied Psychology*, 4, 797–807.
- Kegan, R. (1983). *The evolving self*. Harvard: Harvard University Press.
- Kelley, W. M., Macrae, C. N., Wyland, C. L., Caglar, S., & Inati, S. (2002). Finding the self? An event-related fMRI study. *Journal of Cognitive Neuroscience*, 14(5), 785–794.
- Keselman, H. J. (1998). Testing treatment effects in repeated measures designs: An update for psychophysiological researchers. *Psychophysiology*, 35, 470–478.
- Kjaer, T. W., Nowak, M., Kjaer, K. W., Lou, A. R., Lou, H. C., & Kennedy Institute, D. K. G. D. John F. (2001). Precuneus-pre-frontal activity during awareness of visual verbal stimuli. *Consciousness and Cognition*, 10(3), 356–365.
- Lazar, S. W., Bush, G., Gollub, R. L., Fricchione, G. L., Khalsa, G., & Benson, H. (2000). Functional brain mapping of the relaxation response and meditation. *Neuroreport*, 11(7), 1581–1585.
- Lim, Y. A., Boone, T., Flarity, J., & Thompson, W. (1993). Effects of Qigong on cardiorespiratory changes. *The American Journal of Chinese Medicine*, 21, 1–6.
- Lou, H. C., Kjaer, T. W., Friberg, L., Wildschiodtz, G., Holm, S., & Nowak, M. (1999). A 15O-H₂O PET study of meditation and the resting state of normal consciousness. *Human Brain Mapping*, 7(2).
- Maharishi Mahesh Yogi. (1969). *Maharishi Mahesh Yogi on the Bhagavad Gita*. New York: Penguin.
- Marshall, J. C., & Fink, G. R. (2001). Spatial cognition: Where we were and where we are. *NeuroImage*, 14(1, Pt. 2), S2–S7.

- Mason, L. I., Alexander, C. N., Travis, F. T., Marsh, G., Orme-Johnson, D. W., Gackenbach, J., Mason, D. C., Rainforth, M., & Walton, K.G. (1997) Electrophysiological correlates of higher states of consciousness during sleep in long-term practitioners of the Transcendental Meditation program. *Sleep*, 20 (2), 102–110.
- Moll, J., de Oliveira-Souza, R., Eslinger, P. J., Bramati, I. E., Mourão-Miranda, J., Andreiuolo, P. A., & Pessoa, L. (2002). The neural correlates of moral sensitivity: A functional magnetic resonance imaging investigation of basic and moral emotions. *The Journal of Neuroscience: The Official Journal of the Society for Neuroscience* 22(7), 2730–2736.
- Moll, J., Eslinger, P. J., & Oliveira-Souza, R. (2001). Frontopolar and anterior temporal cortex activation in a moral judgment task: Preliminary functional MRI results in normal subjects. *Arquivos de neuro-psiquiatria*, 59(3-B), 657–664.
- Newberg, A., & Iversen, J. (2003). The neural basis of the complex mental task of meditation: Neurotransmitter and neurochemical considerations. *Medical Hypotheses*, 61, 282–291.
- Petersen, S. E., Fox, P. T., Posner, M. I., Mintun, M., & Raichle, M. E. (1988). Positron emission tomographic studies of the cortical anatomy of single-word processing. *Nature*, 331(6157), 585–589.
- Posner, M. I., Petersen, S. E., Fox, P. T., & Raichle, M. E. (1988). Localization of cognitive operations in the human brain. *Science*, 240(4859), 1627–1631.
- Posner, M. I., & Raichle, M. E. (1998). The neuroimaging of human brain function. *Proceedings of the National Academy of Sciences of the United States of America*, 95(3), 763–764.
- Raichle, M. E., MacLeod, A. M., Snyder, A. Z., Powers, W. J., Gusnard, D. A., & Shulman, G. L. (2001). A default mode of brain function. *Proceedings of the National Academy of Sciences of the United States of America*, 98(2), 676–682.
- Ruby, P., & Decety, J. (2001). Effect of subjective perspective taking during simulation of action: A PET investigation of agency. *Nature Neuroscience*, 4(5), 546–550.
- Ruby, P., Sirigu, A., & Decety, J. (2002). Distinct areas in parietal cortex involved in long-term and short-term action planning: A PET

- investigation. *Cortex; A Journal Devoted to the Study of the Nervous System and Behavior*, 38(3), 321–339.
- Shadich, W. R., Cook, T. D., & Campbell, D. T. (2002). *Experimental and quasi-experimental designs*. New York: Houghton Mifflin Co.
- Shear, J., & Jevning, R. (1999). Pure consciousness: Scientific exploration of meditation techniques. *Journal of Consciousness Studies*, 6(2–3), 189–209.
- Snyder, A. Z., Abdullaev, Y. G., Posner, M. I., & Raichle, M. E. (1995). Scalp electrical potentials reflect regional cerebral blood flow responses during processing of written words. *Proceedings of the National Academy of Sciences of the United States of America*, 92(5), 1689–1693.
- Sommer, B. (1991). *A practical guide to behavioral research*. New York: Oxford University Press.
- Spearman, C. (1904). General intelligence: Objectively determined and measured. *American Journal of Psychology*, 15, 201–292.
- Taylor, J. G. (2001). The central role of the parietal lobes in consciousness. *Consciousness and Cognition*, 10(3), 379–417.
- Tecce, J. J., & Cattanach, L. (1993). Contingent negative variation (CNV). In E. Niedermeyer & R. Lopes da Silva (Eds.), *Electroencephalography: Basic principles, clinical applications, and related fields* (pp. 887–910). Baltimore: Williams & Wilkins.
- Thatcher, R. W. (1992). Cyclic cortical reorganization during early childhood. *Brain and cognition*, 20(1), 24–50.
- Travis, F., & Pearson, C. (2000). Pure consciousness: Distinct phenomenological and physiological correlates of “consciousness itself.” *The International Journal of Neuroscience*, 100(1–4).
- Travis, F., Tecce, J. J., & Durchholz, C. (2001). Cortical plasticity, CNV, and transcendent experiences: Replication with subjects reporting permanent transcendental experiences. *Psychophysiology*, 38, S95.
- Travis, F., & Wallace, R. K. (1997). Autonomic patterns during respiratory suspensions: Possible markers of transcendental consciousness. *Psychophysiology*, 34(1), 39–46.
- Travis, F. T., Tecce, J., Arenander, A., & Wallace, R. K. (2002). Patterns of EEG coherence, power, and contingent negative varia-

- tion characterize the integration of transcendental and waking states. *Biological Psychology*, 61, 293–319.
- van Boxtel, G. J., & Brunia, C. H. (1994). Motor and non-motor aspects of slow brain potentials. *Biological Psychology*, 38(1), 37–51.
- Varela, F., Lachaux, J.-P., Rodriguez, E., & Martinerie, J. (2001). The Brainweb: Phase synchronization and large-scale integration. *Neuroscience*, 2, 220–230.
- Vogeley, K., Bussfeld, P., Newen, A., Herrmann, S., Happae, F., Falkai, P., Maier, W., Shah, N. J., Fink, G. R., & Zilles, K. (2001). Mind reading: Neural mechanisms of theory of mind and self-perspective. *NeuroImage*, 14(1, Pt 1), 170–181.
- Vogeley, K., Kurthen, M., Falkai, P., & Maier, W. (1999). Essential functions of the human self model are implemented in the prefrontal cortex. *Consciousness and Cognition*, 8(3), 343–363.
- von Stein, A., & Sarnthein, J. (2000). Different frequencies for different scales of cortical integration: From local gamma to long range alpha/theta synchronization. *International Journal of Psychophysiology*, 38, 301–313.
- Walter, W. G., Cooper, R., Aldridge, V. J., McCallum, W. C., & Winter, A. L. (1964). Contingent negative variation. An electric sign of sensorimotor association and expectancy in the human brain. *Nature*, 203, 380–384.
- Watson, D., & Clark, L. A. (1984). Negative affectivity: The disposition to experience aversive emotional states. *Psychology Bulletin*, 96, 465–490.
- Wilber, K. (2000). *Integral psychology*. Boston: Shambhala Publications.

This article, “Psychological and Physiological Characteristics of a Proposed Object-Referral/Self-Referral Continuum of Self-Awareness,” by Frederick Travis, Ph.D. et al., here revised/updated, and reprinted with permission, was originally published in *Consciousness and Cognition* 13 (2004) 401–420.

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