

ANNOTATED BIBLIOGRAPHY

SCIENTIFIC RESEARCH ON MAHARISHI'S TRANSCENDENTAL MEDITATION AND TM-SIDHI PROGRAM VOLUMES 1-6

The following pages contain a complete reference list and summarize the findings of the first 503 scientific research papers on Maharishi's Transcendental Meditation and TM-Sidhi program contained in Volumes 1, 2, 3, 4, 5 and 6 of *Scientific Research on Maharishi's Transcendental Meditation and TM-Sidhi Program: Collected Papers*. The numbers before the references refer to the designated numbers of the papers as they are reprinted in the Collected Papers.

Whenever a paper has previously been published in a professional journal or other publication, the reference to that publication is given. In all other cases, details of the institutes or universities at which the research was conducted and conferences at which the results were presented are given.

VOLUME 1

ORME-JOHNSON, D. W., and FARROW, J. T., eds. 1977. *Scientific research on the Transcendental Meditation program: Collected papers, vol. 1*. Rheinweiler, W. Germany: MERU Press.

PART I: PHYSIOLOGY

The Studies in the First Two Sections Document Changes during the Practice of the Transcendental Meditation Technique Unless Otherwise Stated.

A: Metabolic Changes

1. WALLACE, R. K. Physiological effects of Transcendental Meditation. *Science* 167: 1751–1754, 1970.
Indications of Deep Rest along with Wakeful, Ordered State of Brain Functioning: Decreased Metabolic Rate (Decreased Oxygen Consumption and Unchanged Respiratory Quotient); Decreased Minute Ventilation; Decreased Heart Rate; Increased Basal Skin Resistance; Increased Regularity and Intensity of EEG Alpha Activity.

2. WALLACE, R. K. The physiological effects of Transcendental Meditation: A proposed fourth major state of consciousness. Doctoral thesis, Department of Physiology, School of Medicine, University of California at Los Angeles, Los Angeles, California, U.S.A., 1970.
Indications of Deep Rest along with Wakeful, Ordered State of Brain Functioning: Decreased Metabolic Rate (Decreased Oxygen Consumption and Decreased Carbon Dioxide Elimination); Normal Arterial Oxygen and Carbon Dioxide Partial Pressures; Decreased Respiration Rate; Decreased Heart Rate; Increased Basal Skin Resistance; Increased Regularity and Intensity of EEG Alpha Activity in Frontal and Central Regions. Reduction in Biochemical Index of Stress: Decreased Arterial Lactate Levels. Self-Reported Improvements in Physical and Mental Health, and Resistance to Disease.
3. WALLACE, R. K., et al. A wakeful hypometabolic physiologic state. *American Journal of Physiology* 221: 795–799, 1971.
Indications of Deep Rest along with Wakeful, Ordered State of Brain Functioning: Decreased Metabolic Rate (Decreased Oxygen Consumption and Decreased Carbon Dioxide Elimination); Normal Arterial Oxygen and Carbon Dioxide Partial Pressures; Decreased Respiration Rate; Decreased Minute Ventilation; Decreased Heart Rate; Increased Basal Skin Resistance; Increased Regularity and Intensity of EEG Alpha Activity in Frontal and Central Regions; Episodes of Rhythmical EEG Theta Activity in Frontal Region. Reduction in Biochemical Index of Stress: Decreased Arterial Lactate Levels.
4. WALLACE, R. K., et al. The physiology of meditation. *Scientific American* 226: 84–90, 1972.
Indications of Deep Rest along with Wakeful, Ordered State of Brain Functioning: Decreased Metabolic Rate (Decreased Oxygen Consumption and Decreased Carbon Dioxide Elimination); Normal Arterial Oxygen and Carbon Dioxide Partial Pressures; Decreased Respiration Rate; Decreased Minute Ventilation; Decreased Heart Rate; Increased Skin Resistance; Increased Regularity and Intensity of EEG Alpha Activity in Frontal and Central Regions. Reduction in Biochemical Index of Stress: Decreased Arterial Lactate Levels.
5. ALLISON, J. Respiratory changes during Transcendental Meditation. *Lancet* (7651): 833, 1970.
Indication of Deep Rest: Decreased Respiration Rate.
6. COREY, P. W. Airway conductance and oxygen consumption changes associated with practice of the Transcendental Meditation technique. University of Colorado Medical Center, Denver, Colorado, U.S.A., 1973.
Increased Ease of Breathing: Increased Airway Conductance. Indications of Deep Rest: Decreased Metabolic Rate (Decreased Oxygen Consumption and Decreased Carbon Dioxide Elimination); Decreased Heart Rate. Maintenance of a Relaxed Style of Physiological Functioning Outside of Meditation: Lower Basal Metabolic Rate After Meditation.

7. FARROW, J. T. Physiological changes associated with transcendental consciousness, the state of least excitation of consciousness. Psychophysiology Laboratory, Centre for the Study of Higher States of Consciousness, Maharishi European Research University, Switzerland, 1975.
Experience of Transcendental Consciousness Associated with: High EEG Coherence in the Theta, Alpha, and Beta Bands; Episodes of Spontaneous Breath Suspension (Not Followed by Hyperventilation); Marked Reductions in Respiration Rate, Minute Ventilation, Metabolic Rate (Oxygen Consumption and Carbon Dioxide Elimination), and Heart Rate; Increased Basal Skin Resistance; Cessation of Spontaneous Skin Resistance Response.
8. HEBERT, J. R. Periodic suspension of respiration during the Transcendental Meditation technique. Psychophysiology Laboratory, Centre for the Study of Higher States of Consciousness, Maharishi European Research University, Switzerland, 1976.
Maximum State of Deep Rest: Episodes of Spontaneous Breath Suspension (Not Followed by Hyperventilation).
9. DHANARAJ, V. H., and SINGH, M. Reduction in metabolic rate during the practice of the Transcendental Meditation technique. Doctoral thesis of first author (summary), Department of Physical Education, University of Alberta, Edmonton, Alberta, Canada. Paper presented at the first Canadian Congress for Multidisciplinary Study of Sport and Physical Activity, Quebec, Canada, October 1973.
Indications of Deep Rest: Decreased Metabolic Rate (Decreased Oxygen Consumption and Unchanged Respiratory Quotient); Decreased Tidal Volume; Decreased Respiration Rate.
10. BAKKER, R. Decreased respiratory rate during the Transcendental Meditation technique: A replication. Department of Biology, California State College at Sonoma, Sonoma, California, U.S.A., 1974.
Indication of Deep Rest: Decreased Respiration Rate.
11. LEVANDER, V. L., et al. Increased forearm blood flow during a wakeful hypometabolic state. *Federation Proceedings* 31: 405 (Abstract), 1972.
Small Increase in Forearm Blood Flow.
12. JEVNING, R.; WILSON, A.; VANDERLAAN, E.; and LEVINE, S. Plasma prolactin and cortisol during Transcendental Meditation. Findings previously published in *The Endocrine Society Program 57th Annual Meeting*, New York City, 18–20 June 1975, p. 257 (Abstract).
Reduction in Biochemical Index of Stress: Decreased Plasma Cortisol Levels. Small Increase in Plasma Prolactin Immediately following Transcendental Meditation.
13. JEVNING, R.; WILSON, A. F.; and SMITH, W. R. Plasma amino acids during the Transcendental Meditation technique: Comparison to sleep. Findings previously

published in *Sleep research*, vol. 4, ed. M. H. Chase, W. C. Stern, and P. L. Walter, pp. 79–80 (Abstract). Los Angeles: Brain Information Service, Brain Research Institute, University of California at Los Angeles, Los Angeles, California, U.S.A., 1975.

Increased Plasma Phenylalanine Levels.

B: Electrophysiological and Electroencephalographic Changes

14. BANQUET, J. P. EEG and meditation. *Electroencephalography and Clinical Neurophysiology* 33: 454 (Abstract), 1972.
EEG Indications of Restful Alertness: Coexistence of Theta and Delta with Alpha and Beta EEG Activity. Increased Orderliness and Integration of Brain Functioning: Hypersynchrony and Rhythmicity; Synchronization of Anterior and Posterior Channels; Periods of Uniformity of Frequency and Amplitude from All Leads.
15. BANQUET, J. P. Spectral analysis of the EEG in meditation. *Electroencephalography and Clinical Neurophysiology* 35: 143–151, 1973.
Increased Orderliness and Integration of Brain Functioning: High Amplitude EEG Alpha Activity Extending to Anterior Channels; Bursts of High Amplitude Theta Activity in All Channels; Rhythmic High Amplitude Beta Activity in All Channels; Synchronization of Anterior and Posterior Channels.
Electromyographic Evidence of Deep Muscular Relaxation.
16. WESTCOTT, M. Hemispheric symmetry of the EEG during the Transcendental Meditation technique. Department of Psychology, University of Durham, Durham, England, 1973.
Increased Orderliness and Integration of Brain Functioning: High Levels of Interhemispheric EEG Alpha Correlation; Greater Power Balance between Right and Left Hemispheres.
17. BANQUET, J. P., and SAILHAN, M. EEG analysis of spontaneous and induced states of consciousness. *Revue d'électroencéphalographie et de neurophysiologie clinique* 4: 445–453, 1974.
EEG Indications of Restful Alertness: Less Activation (Decreased Proportion of Beta to Alpha); Greater Wakefulness (Increased Proportion of Alpha to Delta).
Increased Orderliness and Integration of Brain Functioning: Greater Interhemispheric and Intrahemispheric EEG Synchrony.
18. KRAS, D. J. The Transcendental Meditation technique and EEG alpha activity. Department of Psychology, Stirling University, Stirling, Scotland, 1974.
EEG Indications of Restful Alertness: Increased Alpha Activity in All Areas of the Brain. Maintenance of a More Relaxed Style of Physiological Functioning Outside of Meditation: Persistence of Greater Alpha Activity following Meditation.
19. BANQUET, J. P., and SAILHAN, M. Quantified EEG spectral analysis of sleep and

Transcendental Meditation. Stanley Cobb Laboratories for Psychiatric Research, Massachusetts General Hospital and Harvard Medical School, Boston, Massachusetts, U.S.A., and Institut La Rochefoucauld, Paris, France. Paper presented at the Second European Congress on Sleep Research, Rome, Italy, 10 April 1974.

EEG Indications of Inner Wakefulness during Sleep.

20. LEVINE, P. H.; HEBERT, J. R.; HAYNES, C. T.; and STROBEL, U. EEG coherence during the Transcendental Meditation technique. Psychophysiology Laboratory, Centre for the Study of Higher States of Consciousness, Maharishi European Research University, Switzerland, 1976.
Increased Orderliness and Integration of Brain Functioning: Increased EEG Coherence Especially in Alpha and Theta Bands.
21. HAYNES, C. T.; HEBERT, J. R.; REBER, W.; and ORME-JOHNSON, D. W. The psychophysiology of advanced participants in the Transcendental Meditation program: Correlations of EEG coherence, creativity, H-reflex recovery, and experience of transcendental consciousness. Psychophysiology Laboratory, Centre for the Study of Higher States of Consciousness, Maharishi European Research University, Switzerland, 1976.
Correlations between High EEG Coherence, High Levels of Creativity, Enhanced Neurological Efficiency (Faster H-Reflex Recovery), and Clarity of Experiences of Transcendental Consciousness.
22. JANBY, J. Immediate effects of the Transcendental Meditation technique: Increased skin resistance during first meditation after instruction. Institute of Psychology, University of Aarhus, Aarhus, Denmark, 1973.
Indication of Deep Relaxation: Marked Increase in Basal Skin Resistance.
23. LAURIE, G. An investigation into the changes in skin resistance during the Transcendental Meditation technique. Department of Psychology, Portsmouth Polytechnic, Portsmouth, Hampshire, England, 1973.
Indication of Deep Relaxation: Marked Increase in Basal Skin Resistance.
24. WEST, M. A. Changes in skin resistance in subjects resting, reading, listening to music, or practicing the Transcendental Meditation technique. University College of Swansea, University of Wales, Swansea, Wales, 1973.
Indication of Deep Relaxation: Marked Increase in Basal Skin Resistance.

C: Physiological Efficiency and Stability

25. ORME-JOHNSON, D. W. Autonomic stability and Transcendental Meditation. *Psychosomatic Medicine* 35: 341–349, 1973.
Improved Resistance to Stress and Greater Autonomic Stability: Faster Habituation of Skin Resistance Response to Stressful Stimuli; Fewer Multiple Responses; Fewer Spontaneous Skin Resistance Responses.

26. WILCOX, G. G. Autonomic functioning in subjects practicing the Transcendental Meditation technique. School of Applied Psychology, University of New South Wales, Sydney, New South Wales, Australia, 1973.
Improved Resistance to Stress and Greater Autonomic Stability: Faster Habituation of Skin Resistance Response to Stressful Stimuli; Fewer Spontaneous Skin Resistance Responses.
27. BERKER, E. Stability of skin resistance responses one week after instruction in the Transcendental Meditation technique. Department of Biology, Rollins College, Winter Park, Florida, U.S.A., 1974.
Improved Resistance to Stress and Greater Autonomic Stability: Faster Habituation of Skin Resistance Response to Stressful Stimuli; Fewer Spontaneous Skin Resistance Responses.
28. SMITH, T. R. The Transcendental Meditation technique and skin resistance response to loud tones. Department of Psychology, Eastern Michigan University, Ypsilanti, Michigan, U.S.A., 1974.
Improved Resistance to Stress and Greater Autonomic Stability: Faster Habituation of Skin Resistance Response to Stressful Stimuli.
29. WILLIAMS, P., and WEST, M. EEG responses to photic stimulation in persons experienced at meditation. *Electroencephalography and Clinical Neurophysiology* 39: 519–522, 1975.
EEG Indications of Greater Alertness (in Response to Photic Stimulation).
30. ROUTT, T. J. Low normal heart and respiration rates in individuals practicing the Transcendental Meditation technique. Department of Psychology, Huxley College of Environmental Studies, Western Washington State College, Bellingham, Washington, U.S.A., 1973.
Increased Basal Skin Resistance during Transcendental Meditation.
Maintenance of a Relaxed Style of Physiological Functioning outside the Practice of Transcendental Meditation: Lower Heart Rate; Lower Respiration Rate.
31. MCDONAGH, J. M., and EGENES, T. The Transcendental Meditation technique and temperature homeostasis. Department of Psychology, St. Mary's College, Notre Dame, Indiana, U.S.A., 1973.
Enhanced Temperature Homeostasis: Faster Recovery of Normal Skin Temperature following Exertion.

D: Health

32. WALLACE, R. K., et al. Decreased blood pressure in hypertensive subjects who practiced meditation. Supplement 11 to *Circulation* 45 and 46: 516 (Abstract), 1972.
Improvements in Hypertensive Subjects: Decreased Blood Pressure.

33. BLACKWELL, B.; HANENSON, I. B.; BLOOMFIELD, S. S.; MAGENHEIM, H. G.; NIDICH, S. I.; and GARTSIDE, P. Effects of Transcendental Meditation on blood pressure: A controlled pilot experiment. *Psychosomatic Medicine* 37(1): 86 (Abstract), 1976.
Improvements in Hypertensive Subjects: Decreased Blood Pressure; Decreased Anxiety.
34. SIMON, D. B.; OPARIL, S.; and KIMBALL, C. P. The Transcendental Meditation program and essential hypertension. Hypertension Clinic and Department of Psychiatry, Pritzker School of Medicine, University of Chicago, Chicago, Illinois, U.S.A., 1974.
Improvements in Hypertensive Subjects: Decreased Blood Pressure.
Improvements in Patients with Angina Pectoris: Improved Exercise Tolerance; Increased Maximum Workload; Delayed Appearance of Electrocardiographic Abnormalities during Exercise (Delayed Onset of ST Segment Depression); Decreased Double Product; Clinical Observations of Decreased Anxiety; Decreased Need for Tranquillizers and Anti-Anginal Drugs; Improved Sleeping Patterns; Improved Personal Relationships.
35. ZAMARRA, J.W. ; BESSEGHINI, I.: and WITTENBERG, S. The effects of the Transcendental Meditation program on the exercise performance of patients with angina pectoris. Department of Medicine, State University of New York at Buffalo, New York, U.S.A., and Buffalo Veterans Administration Hospital, Buffalo, New York, U.S.A., 1975.
Improvements in Patients with Angina Pectoris; Improved Exercise Tolerance; Increased Maximum Workload; Delayed Appearance of Electrocardiographic Abnormalities during Exercise (Delayed Onset of ST Segment Depression); Decreased Double Product; Clinical Observations of Decreased Anxiety; Decreased Need for Tranquillizers and Anti-Anginal Drugs; Improved Sleeping Patterns; Improved Personal Relationships.
36. HONSBERGER, R. W., and WILSON, A. F. The effect of Transcendental Meditation upon bronchial asthma. *Clinical Research* 21: 278 (Abstract), 1973.
Improvements in Patients with Bronchial Asthma: Decreased Severity of Symptoms Reported by Patients and Physicians; Reduced Airway Resistance.
37. HONSBERGER, R. W., and WILSON, A. F. Transcendental Meditation in treating asthma. *Respiratory Therapy: The Journal of Inhalation Technology* 3: 79–80, 1973.
Improvements in Patients with Bronchial Asthma: Decreased Severity of Symptoms; Reduced Airway Resistance.
38. WILSON, A. F.; HONSBERGER, R. W.; CHIU, J. T.; and NOVEY, H. S. Transcendental Meditation and asthma. *Respiration* 32: 74–80, 1975.
Improvements in Patients with Bronchial Asthma: Decreased Severity of Symptoms Reported by Patients and Physicians; Reduced Airway Resistance.

39. KLEMONS, I. M. Changes in inflammation in persons practicing the Transcendental Meditation technique. Department of Health Education, Pennsylvania State University, University Park, Pennsylvania, U.S.A., 1972.
Improved Periodontal Health: Decreased Gingival Inflammation.
40. MISKIMAN, D. E. The effect of the Transcendental Meditation program on compensatory paradoxical sleep. Graduate Department of Psychology, University of Alberta, Edmonton, Alberta, Canada, 1972.
Faster Recovery from Sleep Deprivation.
41. MISKIMAN, D. E. The treatment of insomnia by the Transcendental Meditation program. Graduate Department of Psychology, University of Alberta, Edmonton, Alberta, Canada, 1972.
Relief from Insomnia: Decreased Time Taken to Fall Asleep.
42. MISKIMAN, D. E. Long-term effects of the Transcendental Meditation program in the treatment of insomnia. Graduate Department of Psychology, University of Alberta, Edmonton, Alberta, Canada, 1975.
Relief from Insomnia: Decreased Time Taken to Fall Asleep (Benefits Sustained over Time).
43. MCINTYRE, M. E.; SILVERMAN, F. H.; and TROTTER, W. D. Transcendental Meditation and stuttering: A preliminary report. *Perceptual and Motor Skills* 39: 294 (Abstract), 1974.
Decreased Stuttering.
44. WELDON, J. T., and ARON, A. The Transcendental Meditation program and normalization of weight. Department of Psychology, Maharishi International University, Fairfield, Iowa, U.S.A., 1974.
Normalization of Weight.

E. Motor and Perceptual Ability, and Athletic Performance

45. SHAW, R., and KOLB, D. Reaction time following the Transcendental Meditation technique. Graduate Department of Psychology, University of Texas at Austin, Austin, Texas, U.S.A., 1971.
Improved Mind-Body Co-ordination: Faster Reactions.
46. APPELLE, S., and OSWALD, L. E. Simple reaction time as a function of alertness and prior mental activity. *Perceptual and Motor Skills* 38: 1263–1268, 1974.
Improved Mind-Body Co-ordination: Faster Reactions.
47. ORME-JOHNSON, D. W.; KOLB, D.; and HEBERT, J. R. An experimental analysis of the effects of the Transcendental Meditation technique on reaction time. International Center for Scientific Research, Maharishi International University, Fairfield, Iowa, U.S.A., 1973.
Improved Mind-Body Co-ordination: Faster Reactions.

48. BLASDELL, K. S. The effects of the Transcendental Meditation technique upon a complex perceptual-motor task. Department of Kinesiology, University of California at Los Angeles, Los Angeles, California, U.S.A., 1971.
Improved Mind-Body Co-ordination: Superior Perceptual-Motor Performance.
49. RIMOL, A. G. P. The Transcendental Meditation technique and its effects on sensory-motor performance. Department of Psychology, Princeton University, Princeton, New Jersey, U.S.A., 1974.
Improved Mind-Body Co-ordination: Short- and Long-Term Improvements in Complex Sensory-Motor Performance.
50. PIROT, M. The effects of the Transcendental Meditation technique upon auditory discrimination. Department of Psychology, University of Victoria, Victoria, British Columbia, Canada, 1973.
Increased Perceptual Acuity: Improved Auditory Temporal Discrimination.
51. PELLETIER, K. R. Influence of Transcendental Meditation upon autokinetic perception. *Perceptual and Motor Skills* 39: 1031–1034, 1974.
Increased Field Independence (Growth of a Stable Internal Frame of Reference, Increased Perceptual Acuity).
52. PELLETIER, K. R. The effects of the Transcendental Meditation program on perceptual style: Increased field independence. Langley Porter Neuropsychiatric Institute, University of California School of Medicine, San Francisco, California, U.S.A. Paper presented at the meeting of the Western Psychological Association, San Francisco, California, 25–28 April 1974.
Increased Field Independence (Growth of a Stable Internal Frame of Reference, Increased Perceptual Acuity).
53. REDDY, M. K.; BAI, A. J. L.; and RAO, V. R. The effects of the Transcendental Meditation program on athletic performance. A.P. Sports Council, Lal Bahadar Stadium, and Nilouffer Hospital Hyderabad, Andhra Pradesh, India, 1974.
Benefits for Athletes: Improved Physiological Functioning—Improved Cardiovascular Efficiency; Improved Respiratory Efficiency (Increased Vital Capacity); Reduction of Blood Pressure to More Ideal Levels; Increased Hemoglobin Concentration. Improved Athletic Performance and Neuromuscular Integration—Increased Running Speed; Improved Standing Broad Jump; Improved Agility; Faster Reactions and Improved Co-ordination. Increased Intelligence.

PART II: PSYCHOLOGY

A: Intelligence, Learning, and Academic Performance

54. TJOA, A. Some evidence that the Transcendental Meditation program increases

- intelligence and reduces neuroticism as measured by psychological tests. G.I.T.P., Amsterdam, the Netherlands, 1972.
Benefits for High School Students: Decreased Neuroticism; Greater Intelligence Growth Rate: Increased Fluid Intelligence.
55. TJOA, A. Increased intelligence and reduced neuroticism through the Transcendental Meditation program. Findings previously published as “Meditation, neuroticism and intelligence: A follow-up” in *Gedrag: Tijdschrift voor Psychologie (Behavior: Journal of Psychology)* 3: 167–182, 1975.
Increased Fluid Intelligence; Decreased Neuroticism; Decreased Somatic Neurotic Instability.
 56. ABRAMS, A. I. Paired-associate learning and recall: A pilot study of the Transcendental Meditation program. Graduate Department of Education, University of California at Berkeley, Berkeley, California, U.S.A., 1972.
Benefits for University Students: Quicker Acquisition of Information (Better Learning Ability); Superior Recall.
 57. MISKIMAN, D. E. Performance on a learning task by subjects who practice the Transcendental Meditation technique. Graduate Department of Psychology, University of Alberta, Edmonton, Alberta, Canada, 1972.
Benefits for University Students: Superior Learning Ability.
 58. MISKIMAN, D. E. The effect of the Transcendental Meditation program on the organization of thinking and recall (secondary organization). Graduate Department of Psychology, University of Alberta, Edmonton, Alberta, Canada, 1973.
Benefits for University Students: Improved Spontaneous Organization of Memory; Improved Stabilization of Organized Memory; Improved Problem-Solving Ability.
 59. COLLIER, R. W. The effect of the Transcendental Meditation program upon university academic attainment. Department of English as a Second Language, College of Arts and Sciences, University of Hawaii, Honolulu, Hawaii, U.S.A., 1973.
Benefits for University Students: Improved Academic Performance.
 60. HEATON, D. P., and ORME-JOHNSON, D. W. The Transcendental Meditation program and academic achievement. International Center for Scientific Research, Maharishi International University, Fairfield, Iowa, U.S.A., 1974.
Benefits for University Students: Improved Academic Performance.
 61. CORY, R., and HUFNAGEL, P. The effect of the Science of Creative Intelligence course on high school students: A preliminary report. American Foundation for the Science of Creative Intelligence, Hartford, Connecticut, U.S.A., 1974.
Benefits for High School Students: Improved Academic Performance; Reduced State and Trait Anxiety.

62. SHECTER, H. The Transcendental Meditation program in the classroom: A psychological evaluation. Doctoral thesis (summary), Graduate Department of Psychology, York University, North York, Ontario, Canada, *Dissertation Abstracts International* 38 (07) (1977): 3372B.
Benefits for High School Students: Improved Intellectual Performance (Increased Problem Solving Ability); Increased Creativity; Increased Energy Level; Increased Innovation, Autonomy, and Independence; Increased Self-Esteem; Increased Tolerance; Increased Ability to Deal with Abstract and Complex Situations; Decreased Anxiety.
63. MACCALLUM, M. J. The Transcendental Meditation program and creativity. Graduate Department of Psychology, California State University at Long Beach, Long Beach, California, U.S.A., 1974.
Greater Creativity: Greater Fluency, Flexibility, and Originality of Creative Thought.

B: Development of Personality

64. SEEMAN, W.; NIDICH, S.; and BANTA, T. Influence of Transcendental Meditation on a measure of self-actualization. *Journal of Counseling Psychology* 19: 184–187, 1972.
Increased Self-Actualization: Increased Inner-Directedness (Independence, Self-Supportiveness)¹; Increased Spontaneity; Enhanced Self-Regard.
65. FEHR, T.; NERSTHEIMER, U.; and TORBER, S. Study of personality changes resulting from the Transcendental Meditation program: Freiburger Personality Inventory. Department of Social Affairs, MIU/Forschungsring Schopferische Intelligenz, Dormagen, W. Germany, 1972.
Less Nervousness (Less Psychosomatic Disturbance); Less Aggressiveness (Greater Self-Control, Greater Emotional Maturity); Less Depression (Greater Contentment, Greater Self-Confidence); Less Irritability (Greater Calm in Frustrating Situations, Greater Tolerance); Greater Sociability (Greater Friendliness, Greater Liveliness); Greater Placidity (Greater Self-Assuredness, More Good Humor, Less Tendency to Procrastinate); Less Tendency to Dominate (Greater Respectfulness); Less Inhibition (Greater Naturalness, Greater Spontaneity, Greater Self-Sufficiency); Less Neuroticism (Greater Emotional Stability, Less Tension); Greater Self-Reliance (Greater Effectiveness, More Balanced Mood, Greater Vigor).
66. STEK, R. J., and BASS, B. A. Personal adjustment and perceived locus of control among students interested in meditation. *Psychological Reports* 32: 1019–1022,

¹The terms in parentheses are taken from the manual of the psychological test employed in order to clarify the characteristics measured by the test.

1973.

Interest in Learning Transcendental Meditation Found to Be Uncorrelated with Personality Factors.

67. BERG, W. P. VAN DEN, and MULDER, B. Psychological research on the effects of the Transcendental Meditation technique on a number of personality variables. Findings previously published in *Gedrag: Tijdschrift voor Psychologie (Behavior: Journal of Psychology)* 4: 206 – 218, 1976 . See also DIJK, H. VAN, and BERG, W. P. VAN DEN. Begripsvaliditeit van de NPV-Zelfwaarde-Ringschaal. *Heymans Bulletins*, Psychologische Instituten R.U., Groningen, the Netherlands, NR: HB-74–147 Ex.
Less Neuroticism; Greater Self-Esteem; Better Self-Image; Greater Ego Strength; Greater Trust; Greater Satisfaction; Greater Self-Actualization; Less Sensitivity to Criticism; Less Depression; Decreased Sense of Physical Inadequacy.
68. NIDICH, S.; SEEMAN, W.; and SEIBERT, M. Influence of the Transcendental Meditation program on state anxiety. Department of Psychology, University of Cincinnati, Cincinnati, Ohio, U.S.A., 1973.
Decreased Anxiety.
69. HJELLE, L. A. Transcendental Meditation and psychological health. *Perceptual and Motor Skills* 39: 623–628, 1974.
Increased Self-Actualization: Increases in— Time Competence (Ability to Live More Fully in the Present, Ability to Connect Past and Present Meaningfully); Inner-Directedness (Independence, Self-Supportiveness); Self-Actualizing Value (Holding of Values of Self-Actualizing People); Feeling Reactivity (Sensitivity to One's Own Needs and Feelings); Spontaneity; Self-Regard; Capacity for Intimate Contact (Capacity for Warm Interpersonal Relationships). Greater Inner Locus of Control; Less Anxiety.
70. NIDICH, S.; SEEMAN, W.; and DRESKIN, T. Influence of Transcendental Meditation on Self-Actualization: A replication. *Journal of Counseling Psychology* 20: 565–566, 1973.
Increased Self-Actualization: Increases in— Time Competence (Ability to Live More Fully in the Present, Ability to Connect Past, Present, and Future Meaningfully); Inner-Directedness (Independence, Self-Supportiveness); Self-Actualizing Value (Holding of Values of Self-Actualizing People); Feeling Reactivity (Sensitivity to One's Own Needs and Feelings); Spontaneity; Self-Acceptance; Capacity for Intimate Contact (Capacity for Warm Interpersonal Relationships).
71. PENNER, W. J.; ZINGLE, H. W.; DYCK, R.; and TRUCH, S. Does an in-depth Transcendental Meditation course effect change in the personalities of the participants? *Western Psychologist* 4: 104–111, 1974.
Greater Interest in Academic Activities; Greater Intellectual Orientation; Greater Aestheticism; Greater Respect for Traditional Religious Values; Greater

Adaptability of Mental Orientation; Greater Autonomy; Greater Social Extraversion; Less Impulsiveness; Greater Personal Integration (Decreased Social Alienation and Emotional Disturbance); Lower Anxiety Level; Greater Altruism.

72. DAVIES, J. The Transcendental Meditation program and progressive relaxation: Comparative effects on trait anxiety and self-actualization. Department of Psychology, University of New England at Armidale, Armidale, New South Wales, Australia, 1974.
Increased Self-Actualization: Increased Inner-Directedness/Time Competence. Increased Feeling Reactivity (Increased Sensitivity to One's Own Needs and Feelings). Reduced Trait Anxiety.
73. SCHILLING, P. B. The effect of the regular practice of the Transcendental Meditation technique on behavior and personality. Department of Clinical Psychology, Eastern Kentucky University, Richmond, Kentucky, U.S.A., 1974.
Decreased Aggression (Increases in: Tactfulness, Calmness, Easygoingness, Forgiveness, and Consideration; Decreases in: Argumentativeness, Irritability, and Threatening Behavior); Improved Leadership Ability; Growth of a More Brave, Adventurous, Action-Oriented Nature; Increased Affiliation (Increases in: Enjoyment of Friends, Maintenance of Associations with Others, Warmth, Neighborliness, and Co-operativeness); Increased Nurturance (Increases in: Need to Give Sympathy and Assistance to Others, Protectiveness, and Consideration for Others); Decreased Use of Drugs; Decreased Use of Alcohol.
74. SHAPIRO, J. The relationship of the Transcendental Meditation program to self-actualization and negative personality characteristics. Doctoral thesis (summary), Department of Psychology, University of Southern California, Los Angeles, California, U.S.A., 1974.
Increased Self-Actualization; Decreased Depression; Decreased Neuroticism; Decreased Aggression; Decreased Anxiety.
75. STERN, M. The effects of the Transcendental Meditation program on trait anxiety. Department of Education, Xavier University, Cincinnati, Ohio, U.S.A., 1974.
Decreased General Anxiety.
76. ORME-JOHNSON, D. W., and DUCK, B. Psychological testing of MIU students: First report. Department of Psychology, Maharishi European Research University, Switzerland, and International Center for Scientific Research, Maharishi International University, Fairfield, Iowa, U.S.A., 1974.
Greater Self-Actualization in Students at Maharishi International University than in Other College Students: Greater—Time Competence (Ability to Live More Fully in the Present, Ability to Connect Past and Present Meaningfully); Inner-Directedness (Independence, Self-Supportiveness); Self-Actualizing Value (Holding of Values of Self-Actualizing People); Spontaneity; Self-Regard; Nature of Man, Constructive (Ability to See Man as Essentially Good); Synergy (Ability to See Opposites of Life as Meaningfully Related); Capacity

for Intimate Contact (Capacity for Warm Interpersonal Relationships).

77. FEHR, T. A longitudinal study of the effect of the Transcendental Meditation program on changes in personality. Department of Social Affairs, MIU/Forschungsring Schöpische Intelligenz, Dormagen, W. Germany, 1974. Decreased Nervousness (Decreased Psychosomatic Disturbance); Decreased Aggressiveness (Increased Self-Control, Increased Emotional Maturity); Decreased Depression (Increased Contentment, Increased Self-Confidence); Decreased Irritability (Increased Calm in Frustrating Situations, Increased Tolerance); Increased Sociability (Increased Friendliness, Increased Liveliness); Increased Placidity (Increased Self-Assuredness, Increased Good Humor, Decreased Tendency to Procrastinate); Decreased Tendency to Dominate (Increased Flexibility, Respectfulness, and Tolerance); Decreased Inhibition (Increases in: Naturalness, Spontaneity, Self-Sufficiency); Increased Extraversion (Increased Capacity for Warm Interpersonal Relationships); Decreased Neuroticism (Increased Emotional Stability, Decreased Tension); Increased Self-Reliance (Increased Effectiveness, More Balanced Mood, Increased Vigor).
78. FERGUSON, P. C., and GOWAN, J. C. Psychological findings on Transcendental Meditation. Also published as “TM—some preliminary psychological findings” in *Journal of Humanistic Psychology* 16(3): 51–60, 1976. Increased Self-Actualization; Decreased Anxiety; Decreased Depression; Decreased Neuroticism.

PART III: SOCIOLOGY

A: Rehabilitation

79. WINQUIST, W. T. The Transcendental Meditation program and drug abuse: A retrospective study. Department of Sociology, University of California at Los Angeles, Los Angeles, California, U.S.A., 1969. Decreased Drug Abuse.
80. WALLACE, R. K., et al. Decreased drug abuse with Transcendental Meditation: A study of 1,862 subjects. In *Drug Abuse: Proceedings of the International Conference*, ed. Chris J. D. Zarafonitis, pp. 369–376. Philadelphia: Lea and Febiger, 1972. Decreased Drug Abuse; Decreased Use of Alcohol; Decreased Use of Cigarettes; Decreased Drug Selling; Increased Tendency to Discourage the Use of Drugs by Others.
81. BRAUTIGAM, E. Effects of the Transcendental Meditation program on drug abusers: A prospective study. Department of Psychology, University of Lund, Lund, Sweden, 1972. Increased Psychological Stability; Increased Adjustment (Increased Self-

Acceptance, Satisfaction, and Ability to Handle One's Situation); Decreased Anxiety; Decreased Tension; Decreased Psycho-Motor Retardation; Decreased Drug Abuse.

82. SHAFII, M.; LAVELY, R. A.; and JAFFE, R. D. Meditation and marijuana. *American Journal of Psychiatry* 131: 60–63, 1974.
Decreased Drug Abuse.
83. SHAFII, M.; LAVELY, R. A.; and JAFFE, R. Meditation and the prevention of alcohol abuse. *American Journal of Psychiatry* 132: 942–945, 1975.
Decreased Use of Alcohol.
84. LAZAR, Z.; FARWELL, L.; and FARROW, J. T. The effects of the Transcendental Meditation program on anxiety, drug abuse, cigarette smoking, and alcohol consumption. Graduate School of Education, Boston University, Boston, Massachusetts, U.S.A.; Department of Social Relations, Harvard University, Cambridge, Massachusetts, U.S.A.; and Graduate Department of Biochemistry, Brandeis University, Waltham, Massachusetts, U.S.A., 1972.
Decreased Anxiety; Decreased Use of Cigarettes; Decreased Use of Alcohol; Decreased Drug Abuse.
85. KATZ, D. Decreased drug use and prevention of drug use through the Transcendental Meditation program. International Center for Scientific Research, Maharishi International University, Fairfield, Iowa, U.S.A., 1974.
Decreased Use of Alcohol; Decreased Drug Abuse.
86. SCHENKLUHN, H., and GEISLER, M. A longitudinal study of the influence of the Transcendental Meditation program on drug abuse. Drug Rehabilitation Center of Arbeiterwohlfahrt Kreisverband, Mülheim/Ruhr, W. Germany, 1974.
Decreased Drug Abuse.
87. ORME-JOHNSON, D.; KIEHLBAUCH, J.; MOORE, R.; and BRISTOL, J. Personality and autonomic changes in prisoners practicing the Transcendental Meditation technique. University of Texas at El Paso, El Paso, Texas, U.S.A., 1971.
Rehabilitation of Prisoners: Increased Physiological Stability and Psychological Adaptability—Fewer Spontaneous Skin Resistance Responses; Decreased Obsessive-Compulsive Behavior (Increased Behavioral Flexibility); Decreased Social Introversion (Increased Social Ease and Outgoingness).
88. CUNNINGHAM, M., and KOCH, W. The Transcendental Meditation program and rehabilitation: A pilot project at the Federal Correctional Institution at Lompoc, California. International Meditation Society, Los Angeles, California, U.S.A., 1973.
Rehabilitation of Prisoners: Decreased Anxiety; Other Improvements in Mental Health.
89. BALLOU, D. The Transcendental Meditation program at Stillwater Prison. Graduate

Department of Social Anthropology, University of Kansas, Lawrence, Kansas, U.S.A., 1973.

Rehabilitation of Prisoners: Decreased Anxiety; Decreased Prison Disciplinary Rule Infractions; Fewer Parole Violations; Increased Participation in Recreational and Educational Activities; Decreased Drug Abuse.

90. CHILDS, J. P. The use of the Transcendental Meditation program as a therapy with juvenile offenders. Doctoral dissertation (abbr.), Department of Educational Psychology and Guidance, University of Tennessee, Knoxville, Tennessee, U.S.A., 1973. *Dissertation Abstracts International* 34/08-A, 1973, Order Number AAD74-03806.
Rehabilitation of Juvenile Offenders: Decreased Anxiety; Positive Change as Reported by Both Subjects and Parents; Decreased Drug Abuse; Decreased Court Problems; Increased Happiness; Improved Interpersonal Relationships; Increased Self-Actualization; Enhanced Self-Regard.
91. NIDICH, S. I. A study of the relationship of the Transcendental Meditation program to Kohlberg's stages of moral reasoning. Doctoral thesis (abbr.), Department of Learning and Development, College of Education, University of Cincinnati, Cincinnati, Ohio, U.S.A., 1975. *Dissertation Abstracts International* 36: 4361a-4362a, 1975.
Greater Moral Maturity.
92. ROSS, J. The effects of the Transcendental Meditation program on anxiety, neuroticism, and psychoticism. Master's thesis, Graduate Department of Psychology, University of Edinburgh, Edinburgh, Scotland, 1972.
Decreased Anxiety; Decreased Neuroticism; Decreased Psychoticism.
93. ORME-JOHNSON, D. W.; ARTHUR, G. K.; FRANKLIN, L.; and O'CONNELL, J. The Transcendental Meditation technique and drug abuse counselors. Department of Research and Evaluation, Drug and Alcohol Abuse Control and Prevention Program, Fort Bliss, Texas, U.S.A., 1972.
Improvements in Mental Health: Decreased Anxiety; Decreased Hypochondria; Decreased Internal Conflicts and Confusion; Increased Clarity of Mind, Relaxation, Energy Level, and Sensitivity to Others.
94. DICK, L. D., and RAGLAND, R. E. A study of the Transcendental Meditation program in the service of counseling. Departments of Psychology and Education, University of Oklahoma, Norman, Oklahoma, U.S.A., 1973.
Increased Self-Actualization: Increased Time Competence (Ability to Live More Fully in the Present, Ability to Connect Past, Present, and Future Meaningfully); Increased Inner-Directedness (Independence, Self-Supportiveness); Increased Existentiality (Flexibility in Application of Self-Actualizing Values); Enhanced Self-Regard; Increased Self-Acceptance.
95. BLOOMFIELD, H. H. Some observations on the uses of the Transcendental Meditation program in psychiatry. Institute of Psychophysiological Medicine, San

Diego, California, U.S.A., 1975.

Case Histories Illustrating Benefits in the Treatment of Psychiatric Patients with a Variety of Disorders, Including Anxiety Neurosis, Obsessive-Compulsive Neurosis, Depression, Drug and Alcohol Abuse, Psychosomatic Disorders, and Chronic Insomnia.

B: Productivity and Quality of Life

96. FREW, D. R. Transcendental Meditation and productivity. *Academy of Management Journal* 17: 362–368, 1974.

Increased Productivity; Improved Work Performance; Increased Work Satisfaction; Improved Relations with Co-Workers; Improved Relations with Supervisors; Decreased Turnover Propensity; Decreased Self-Report Climb Orientation/Increased Climb Orientation as Reported by Co-Workers and Supervisors.

97. FRIEND, K. E. Effects of the Transcendental Meditation program on work attitudes and behavior. Graduate School of Business, University of Chicago, Chicago, Illinois, U.S.A., 1975.

Improved Work Performance; Increased Work Satisfaction; Improved Relations with Co-Workers; Improved Relations with Supervisors.

98. BORLAND, C., and LANDRITH III, G. Improved quality of city life through the Transcendental Meditation program: Decreased crime rate. Department of Educational Psychology, Maharishi European Research University, Switzerland, and Department of Psychology, Maharishi International University, Fairfield, Iowa, U.S.A., 1976.

Improved Quality of City Life: Decreased Crime Rate (U.S.A., 1973).

PART IV: THEORETICAL PAPERS

99. DOMASH, L. H. The Transcendental Meditation technique and quantum physics: Is pure consciousness a macroscopic quantum state in the brain? Department of Physics, Maharishi European Research University, Switzerland, 1975.

The Transcendental Meditation Technique and Quantum Physics.

100. ORME-JOHNSON, D. The dawn of the Age of Enlightenment: Experimental evidence that the Transcendental Meditation technique produces a fourth and fifth state of consciousness in the individual and a profound influence of orderliness in society. Department of Psychology, Maharishi European Research University, Switzerland, 1976.

The Dawn of the Age of Enlightenment: Experimental Evidence for Growth of Higher States of Consciousness and a Profound Influence of Orderliness in Society.

101. WALLACE, R. K. Neurophysiology of enlightenment. Paper presented at the 26th International Congress of Physiological Sciences, New Delhi, India, October

1974. Livingston Manor, New York: MIU Press, 1974.
Neurophysiology of Enlightenment.

PART V: THE TM-SIDHI PROGRAM²

102. ORME-JOHNSON, D. W.; CLEMENTS, G.; HAYNES, C. T.; and BADAWI, K. Higher states of consciousness: EEG coherence, creativity, and experiences of the sidhis. Centre for the Study of Higher States of Consciousness, Maharishi European Research University, Switzerland, 1977.
Global EEG Coherence during Experience of the TM-Sidhis; Correlations between High EEG Coherence, Higher States of Consciousness, Experience of the TM-Sidhis, and Creativity.
103. ORME-JOHNSON, D. W., and GRANIERI, B. The effects of the Age of Enlightenment Governor Training Courses on field independence, creativity, intelligence, and behavioral flexibility. Centre for the Study of Higher States of Consciousness, Maharishi European Research University, Switzerland, 1977.
Increased Field Independence (Growth of a More Stable Internal Frame of Reference, Increased Perceptual Acuity); Increased Creativity—Increased Figural Fluency and Originality; Increased Intelligence; Increased Behavioral Flexibility Increased Psychomotor Speed and Motor-Cognitive Flexibility (Findings Indicate a Reversal of the Aging Process).
104. CLEMENTS, G., and MILSTEIN, S. L. Auditory thresholds in advanced participants in the Transcendental Meditation program. Department of Experimental Psychology, Maharishi European Research University, Switzerland, and Institut National de la Recherche Scientifique, Centre de Recherche en Sciences de la Santé, Université du Québec, Montreal-Gamelin, Québec, Canada, 1977.
Greatly Improved Auditory Thresholds.

VOLUME 2

CHALMERS, R. A.; CLEMENTS, G.; SCHENKLUHN, H.; and WEINLESS, M., eds. 1989. *Scientific research on Maharishi's Transcendental Meditation and TM-Sidhi program: Collected papers, vol. 2*. Vlodrop, the Netherlands: MVU Press.

PART I: PHYSIOLOGY

The Studies in the First Two Sections Document Changes during the Practice of the Transcendental Meditation Technique Unless Otherwise Stated.

A: Metabolic, Biochemical, and Cardiovascular Changes

²In Volumes 2, 3, and 4, studies on the TM-Sidhi program appear according to their results under the appropriate headings of Parts I, II, and III of each volume.

105. JEVNING, R.; SMITH, R.; WILSON A. F.; and MORTON, M. E. Alterations in blood flow during Transcendental Meditation. *Psychophysiology* 13: 168 (SPR Abstract # 20), 1976.
Changes in Regional Blood Flow Indicative of Increased Blood Flow to the Brain.
106. JEVNING, R.; WILSON, A. F.; SMITH, W. R.; and MORTON, M. Redistribution of blood flow in Transcendental Meditation. Department of Medicine, University of California at Irvine, Orange, California, U.S.A. Paper presented at the American Psychological Society, San Francisco, California, U.S.A., October 1975.
Changes in Regional Blood Flow Indicative of Increased Blood Flow to the Brain.
107. MCCUAIG, L. W. Salivary electrolytes, protein, and pH during Transcendental Meditation. *Experientia* 30(9): 988–989, 1974.
Increased Concentration of Salivary Electrolytes and Protein.
108. STEHLE, R. Ventilation, heart rate, and respiratory partial pressures of athletes practicing the Transcendental Meditation technique. Diplomarbeit (abbr.), Deutsche Sporthochschule Köln, Cologne, W. Germany, 1975.
Indications of Deep Rest in Athletes: Decreased Metabolic Rate (Decreased Oxygen Consumption and Decreased Carbon Dioxide Elimination); Decreased Respiration Rate; Decreased Heart Rate; Decreased Minute Ventilation.
109. BEVAN, A. J. W.; YOUNG, P. M.; WELLBY, M. L.; NENADOVIC, P.; and DICKINS, J. A. Endocrine changes in relaxation procedures. *Proceedings of the Endocrine Society of Australia* 19: 59 (Abstract), 1976.
Reduction in Biochemical Index of Stress: Decreased Plasma Cortisol Levels. Biochemical Indication of Reduced Stress during Activity: Decreased Urinary Free Cortisol Levels.
110. BUJATTI, M., and RIEDERER, P. Serotonin, noradrenaline, dopamine metabolites in Transcendental Meditation technique. *Journal of Neural Transmission* 39: 257–267, 1976.
Changes in Neurotransmitter Balance: Increased Levels of Serotonin Metabolite (Increased 5-HIAA Levels); Decreased Levels of Adrenaline and Noradrenaline Metabolite (Decreased VMA Levels) and Higher Levels of 5-HIAA outside the Practice of Transcendental Meditation.
111. JEVNING, R., and WILSON, A. F. Acute decline in adrenocortical activity during Transcendental Meditation. Department of Medicine, University of California at Irvine, Orange, California, U.S.A., 1977.
Reduction in Biochemical Index of Stress: Decreased Plasma Cortisol Levels.
112. JEVNING, R., and WILSON, A. F. Altered red cell metabolism in TM. *Psychophysiology* 14: 94 (Abstract), 1977.

Fundamental Change in Cellular Metabolism: Reduced Glucose Metabolism in Red Blood Cells.

113. JEVNING, R.; PIRKLE, H. C.; and WILSON, A. F. Behavioral alteration of plasma phenylalanine concentration. *Physiology & Behavior* 19: 611–614, 1977.
Increased Plasma Phenylalanine Levels.

B: Electrophysiological and Electroencephalographic Changes

114. KOBAL, G.; WANDHÖFER, R. A.; and PLATTIG, K.-H. EEG power spectra and auditory evoked potentials in Transcendental Meditation (TM). *Pflügers Archiv*, Supplement 359: 191, R 96, 1975.
Improved Efficiency of Information Transfer in the Brain: Shorter Latencies of Auditory Evoked Potentials (Both during and outside the Practice of Transcendental Meditation). Increased EEG Alpha Power.
115. KRAHNE, W., and TANELI, B. EEG and Transcendental Meditation. *Pflügers Archiv*, Supplement 359: 190, R 95, 1975.
EEG Indications of Increased Orderliness of Brain Functioning: High Amplitude Alpha and Theta Activity in All Cortical Regions.
116. WANDHÖFER, A.; KOBAL, G.; and PLATTIG, K.-H. Shortening of latencies of human auditory evoked brain potentials during the Transcendental Meditation technique. *Zeitschrift für Elektroenzephalographie und Elektromyographie EEG-EMG* 7: 99–103, 1976. (Transl.)
Improved Efficiency of Information Transfer in the Brain: Shorter Latencies of Auditory Evoked Potentials (Both during and outside the Practice of Transcendental Meditation).
117. DASH, P., and ALEXANDER, C. N. Electrophysiological characteristics during the Transcendental Meditation program and napping: A pilot study. Divisions of Natural and Social Sciences, University of California at Santa Cruz, Santa Cruz, California, U.S.A., 1976.
EEG Differentiation between Transcendental Meditation and Napping.
118. BANQUET, J. P.; HAYNES, C.; HEBERT, R.; and REBER, B. Analysis of sleep in altered states of consciousness by classical EEG and coherence spectra. *Electroencephalography and Clinical Neurophysiology* 43(4): 503, E 203 (Abstract), 1977.
EEG Indications of Lessened Sleep Requirement.
119. BANQUET, J. P.; HAYNES, C.; HEBERT, R.; and REBER, B. Sleep and dream in altered states of consciousness. LENA, La Salpêtrière, Paris, France, and EEG Laboratory, Maharishi European Research University, Seelisberg, Switzerland, 1976.
EEG Indications of Lessened Sleep Requirement.

120. BENNETT, J. E., and TRINDER, J. Hemispheric laterality and cognitive style associated with Transcendental Meditation. *Psychophysiology* 14: 293–296, 1977.
Greater Adaptability of Brain Functioning outside the Practice of Transcendental Meditation: Greater Lateral EEG Asymmetry during Right and Left Hemisphere Tasks.
121. HEBERT, R., and LEHMANN, D. Theta bursts: An EEG pattern in normal subjects practising the Transcendental Meditation technique. *Electroencephalography and Clinical Neurophysiology* 42: 397–405, 1977.
EEG Indications of Increased Inner Satisfaction: Synchronous Theta Bursts.

C: Physiological Efficiency and Stability

122. SULTAN, S. E. A study of the ability of individuals trained in Transcendental Meditation to achieve and maintain levels of physiological relaxation. Master's thesis (abbr.), School of Human Behavior, United States International University, San Diego, California, U.S.A., 1975.
Electromyographic Evidence of Deep Muscular Relaxation; Greater Ability to Maintain Relaxation during Activity.
123. DANIELS, D. Comparison of the Transcendental Meditation technique to various relaxation procedures. Department of Psychology, Washington Singer Laboratories, University of Exeter, Exeter, Devon, England, 1976.
Improved Resistance to Stress: Greater Autonomic Stability—Greater Stability of Skin Resistance in Response to Stressful Stimuli. Improved Auditory Discrimination and Greater Ability to Process Information at Speed (Superior Dichotic Listening).

D: Health

124. LOVELL-SMITH, H. D.; DICKIE, A.; and ROBINSON, J. Blood pressure and plasma cholesterol levels before and after learning Transcendental Meditation. University of Otago Medical School, Dunedin, New Zealand, 1975.
Reduction of Blood Pressure to More Ideal Levels in Both Hypertensive and Normotensive Subjects.
125. DONER, D. W. JR. The Transcendental Meditation technique—a "self-care" program for the dialysis/transplant patient. Findings previously published in *Journal of the American Association of Nephrology Nurses and Technicians* 3(3): 119–125, 1976.
Improved Mental and Physical Health in Patients on a Kidney Transplant/Dialysis Program: Decreased Blood Pressure; Decreased Anxiety; Increased Independence; Enhanced Self-Image; Improved Sense of Well-Being.
126. FUSON, J. W. The effect of the Transcendental Meditation program on sleeping and dreaming patterns. Unpublished doctoral dissertation (abbr.), Yale Medical School, New Haven, Connecticut, U.S.A., 1976.

Improvements in Sleeping and Dreaming Patterns: Improved Quality of Sleep; Decreased Time to Fall Asleep; More Rested on Awakening; Decreased Awakenings per Night; Decreased Time to Awaken Fully; Decreased Drowsiness; Decreased Lethargy; Decreased Daytime Napping; Decreased Number of Dreams Remembered; Decrease in Complexity of Dreams; Decrease in Unpleasant Emotional Content of Dreams; Decrease in Recurring Dreams; Decreased Need for Sleep Medications. Decreased Use of Alcohol. Improved Reported State of Mental Health. Reduced Need for Medical Attention.

127. SUURKÜLA, J. The Transcendental Meditation technique and the prevention of psychiatric illness. Vasa Hospital University of Gothenburg, Gothenburg, Sweden, 1977.

Epidemiological Evidence for Prevention of Psychiatric Illness.

E: Motor and Perceptual Ability, and Athletic Performance

128. GRAHAM, J. The effects of Transcendental Meditation on auditory thresholds. Department of Experimental Psychology, University of Sussex, Brighton, Sussex, England, 1971.

Increased Perceptual Acuity: Improved Auditory Frequency and Amplitude Discrimination.

129. HARDESTY, M. J. The effect of Transcendental Meditation on reaction time. Western Kentucky University, Bowling Green, Kentucky, U.S.A., 1972.

Improved Mind-Body Co-ordination: Faster Reactions (Simple and Choice Visual Reaction Time).

130. REDDY, M. K. The role of the Transcendental Meditation program in the promotion of athletic excellence: Long- and short-term effects and their relation to activation theory. Master's thesis, Centre for the Study of Higher States of Consciousness, Maharishi European Research University, Switzerland, 1976.

Benefits for Athletes: A Unique State of Deep Rest during Transcendental Meditation—Decreased Metabolic Rate (Decreased Oxygen Consumption); Increased Basal Skin Resistance; Fewer Spontaneous Skin Resistance Responses. Improved Physiological Functioning outside the Practice of Transcendental Meditation—Improved Cardiovascular Efficiency; Improved Respiratory Efficiency (Increased Vital Capacity). Improved Athletic Performance and Neuromuscular Integration—Improved Running Speed; Improved Standing Broad Jump; Improved Agility; Faster Reactions.

131. MARTINETTI, R. F. Influence of Transcendental Meditation on perceptual illusion: A pilot study. *Perceptual and Motor Skills* 43: 822, 1976.

Improved Perceptual Ability: Lower Incidence of Perceptual Illusions.

PART II: PSYCHOLOGY

A: Intelligence, Learning, and Academic Performance

132. NATARAJ, P., and RADHAMANI, M. G. The Transcendental Meditation program and its effects on psychological functions in secondary school students of a rural Indian high school. Department of Psychology, Maharani's College, Mysore, India. Research presented at the International Conference on 'Veda and Science', Bangalore, Karnataka, India, 25–30 June 1975.
Benefits for High School Students: Improved Concentration; Improved Reading Comprehension; Improved Memory.
133. OVERBECK, K.-D., and TÖNNIES, S. E. Einige Effekte der Transzendentalen Meditation bei lernbehinderten Sonderschülern. Diplomarbeit of first author (abbr.), Psychologisches Institut III, University of Hamburg, Hamburg, W. Germany, 1975.
Benefits for School Children with Learning Problems: Decreased Anxiety; Decreased Examination Anxiety; Decreased School Dislike.
134. SCHER, D. The effects of Transcendental Meditation on free recall. Master's thesis (abbr.), State University College, New Paltz, New York, U.S.A., 1975.
Improved Memory and Organization of Memory—Effect More Pronounced in Long-Term Meditators.
135. HARRISON, S. D.; PAGANO, R.; and WARKENBURG, S. Meditation and right hemispheric functioning—spatial localization. In *Proceedings of the Biofeedback Research Society, Seventh Annual Meeting*, Colorado Springs, Colorado, U.S.A., 27 February-2 March 1976, p. 33 (Abstract).
More Efficient Functioning of the Right Cerebral Hemisphere: Better Spatial Localization.
136. BERRETTINI, R. B. The effects of the Transcendental Meditation program on short-term recall performance. Master's thesis (abbr.), Department of Education, Wilkes College, Wilkes-Barre, Pennsylvania, U.S.A., 1976.
Benefits for College Students: Improved Short-Term Memory, Ability to Focus Attention, and Spontaneous Organization of Memory.
137. HARDING, S. D. The Transcendental Meditation program in British secondary schools. Department of Experimental Psychology, University of Sussex, Brighton, Sussex, England, 1976.
Decreased Neuroticism in Secondary School Students.
138. BROWN, M. Higher education for higher consciousness: A study of students at Maharishi International University. Doctoral dissertation (abbr.), University of California at Berkeley, Berkeley, California, U.S.A., *Dissertation Abstracts International* 38, 649A–650A, 1976.
Benefits for Students Resulting from Maharishi's Integrated System of Education at Maharishi International University: Greater Interest in Academic Activities; Greater Commitment to Higher Education; Greater Intellectual and Scientific Orientation; Greater Aesthetic Orientation; Greater Respect for

Traditional Religious Values; Greater Optimism about the Future of Society; Greater Altruism (Greater Commitment to Helping Others and Improving Society); Greater Sense of Social Responsibility; Greater Tolerance of Authority; Greater Trust; Greater Sociability; Greater Psychological Stability; Greater Commitment to Personal Growth; Less Anxiety; Less Impulsiveness.

139. JACKSON, Y. Learning disorders and the Transcendental Meditation program: Retrospects and prospects. A preliminary study with economically deprived adolescents. Doctoral thesis (abbr.), University of Massachusetts, Amherst, Massachusetts, U.S.A., 1977. *Dissertation Abstracts International* 38 (6): 3351A, 1977.
Increased Self-Actualization in Economically Deprived Adolescents with Learning Problems: Increased Inner-Directedness (Independence, Self-Supportiveness)³; Increased Self-Regard. Decreased Dropout Rate from School.
140. PAGANO, R. R., and FRUMKIN, L. R. The effect of Transcendental Meditation on right hemispheric functioning. *Biofeedback and Self-Regulation* 2(4): 407–415, 1977.
Superior Synthetic and Holistic Thinking; Enhanced Tonal Memory.

B: Development of Personality

141. CURTIN, T. G. The relationship between Transcendental Meditation and adaptive regression. Doctoral thesis (abbr.), School of Education, Boston University, Boston, Massachusetts, U.S.A., 1973.
Improved Mental Health: Increased Capacity for 'Adaptive Regression' (Conscious Experience of the Inner Self and Ability to Bring the Inner Self to Healthy Expression).
142. BOESE, E., and BERGER, K. Psychological effects of Transcendental Meditation. Department of Behavioral Science, Milton S. Hershey Medical Center, Pennsylvania State University, Hershey, Pennsylvania, U.S.A., 1971.
Decreased Number of Situations in Life Felt to Be a Problem; Decreased Number of Serious Problems Experienced; Decreased Hostility; Enhanced Self-Concept.
143. HAHN, H. R., and WHALEN, T. E. The effects of the Transcendental Meditation program on levels of hostility, anxiety, and depression. Master's thesis (abbr.), Department of Educational Psychology, California State University at Hayward, Hayward, California, U.S.A., 1974.
Decreased Hostility; Decreased Anxiety; Decreased Depression.

³The terms in brackets are taken from the manual of the psychological test employed in order to clarify the characteristics measured by the text.

144. ROSENTHAL, J. M. The effect of the Transcendental Meditation program on self-actualization, self-concept, and hypnotic susceptibility. Master's thesis (abstract), Department of Psychology, University of Hawaii, Honolulu, Hawaii, U.S.A., 1974.
Benefits for University Students: Increased Self-Actualization; Enhanced Self-Concept.
145. FLOYD III, W. T., and HAYNES, J. The influence of Transcendental Meditation on anxiety. Master's thesis of first author (abbr.), Department of Psychology, North Texas State University, Denton, Texas, U.S.A., 1974.
Decreased Anxiety.
146. WILLIS, C. Transcendental Meditation and its influence on the self-concept. Texas A&M University, College Station, Texas, U.S.A., 1974.
Better Self-Concept and Degree of Adjustment; Improved Psychological Health.
147. WEISS, C. The immediate effect of the Transcendental Meditation technique and theoretical reflections upon the psychology and physiology of subjective well-being. Diplomarbeit (abbr.), Institute of Psychology, University of the Saarland, Saarbrücken, W. Germany, 1975.
Increased Elevated Mood; Increased Mental Clarity and Wakefulness; Increased Readiness for Activity; Decreased Vulnerability; Decreased Nervousness; Decreased Fatigue; Decreased Drowsiness; Decreased Lethargy; Decreased Depressed Mood; Decreased Introversiveness; Decreased Aggressive Irritation.
148. GUPTA, N. C. Effects of Transcendental Meditation on anxiety and self-concept. Department of Educational Psychology, Ball State University, Muncie, Indiana, U.S.A., 1974.
Enhanced Self-Concept; Decreased Anxiety.
149. GRIGGS, S. T. A preliminary study into the effect of Transcendental Meditation on empathy. Master's thesis (abbr.), School of Human Behavior, United States International University, San Diego, California, U.S.A., 1976.
Greater Empathy.
150. THROLL, D. A., and THROLL, L. A. The effect of a three-month residence course upon the personalities of experienced meditators. Victoria University, Wellington, New Zealand, 1977.
Increased Ego Strength, Emotional Stability and Maturity, and Decreased Overreactionary Behavior; Increased Emotional Harmony and Absence of Regressive Behavior; Increased Emotional Strength and Lessening of Unwelcome Thoughts or Compulsive Habits; Decreased Depression, Showing a Calmer, More Confident Attitude. Increases in—Intelligence; Self-Sufficiency and Resourcefulness; Contentment; Enthusiasm for Work; Trust; Tolerant and Participating Attitude; Creativity. Decreases in—Anxiety and Tension; Use of Alcohol; Use of Cigarettes; Need for Tranquillizers and Other Prescribed Drugs.

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Increased Self-Actualization: Increases in—Time Competence (Ability to Live More Fully in the Present, Ability to Connect Past, Present, and Future Meaningfully); Inner-Directedness (Independence, Self-Supportiveness); Self-Actualizing Value (Holding of Values of Self-Actualizing People); Feeling Reactivity (Sensitivity to One's Own Needs and Feelings); Spontaneity; Self-Regard; Self-Acceptance; Capacity for Intimate Contact (Capacity for Warm Interpersonal Relationships).
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Biochemical Indications of Reduced Stress: Decreased Serum Growth Hormone Levels; Decreased Serum Cortisol Levels; Decreased Serum Triiodothyronine Levels.

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D: Health

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Benefits in General Medical Practice: Improvements in General Health and in a Wide Variety of Physical and Mental Disorders Including Hypertension; Angina Pectoris; Bronchial Asthma; Chronic Bronchitis; Diabetes Mellitus; Menorrhagia; Periodontal Inflammation; Recurrent Upper Respiratory Infections; Allergic Rhinitis; Chronic Back Pain; Rheumatoid Arthritis; Dyspepsia; Chronic Colitis; Insomnia; Chronic Headaches; Anxiety; Depression; Fatigue; Obesity. Decreased Need for Tranquillizers, Sleep Medications, Anti-Asthmatics, Anti-Hypertensives, and Drugs for Hypertension, Asthma, and Heart Disease. Increased Co-operation with Medical Advice. Recovery from Major Illness, Chronic Musculo-Skeletal Complaints.
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E: Motor and Perceptual Ability

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Experience of Higher States of Consciousness Positively Correlated with Superior Performance on Tests Measuring Perceptual Speed, Flexibility, Creativity, Intelligence, Field Independence, and Psycho-Motor Speed.
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PART II: PSYCHOLOGY

A: Intelligence, Learning, and Academic Performance

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Improved Echolalic Behavior in Autistic Student.
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Improved Speech, Social Behavior, Intelligence, and Physiological Functioning in a Mentally Retarded Subject

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B: Development of Personality

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Less Anxiety; Less Depression; More Affectionate: More Tolerant; Less Tendency to Dominate; Less Interested in Superficial Social Contacts; More Selective in Personal Relationships; Less Need for Acceptance; More Inner-Directed.
269. SANDAHL, F. P. The effect of the practice of TM on the degree of neuroticism as measured by the defense mechanism test. National Defense Research Institute, Karlstad, Sweden, 1978.
Decreased Hidden Mental Turbulence: Decreased Neuroticism.
270. NIDICH, S. I., and NIDICH, R. The Transcendental Meditation and TM-Sidhi program and moral development. Department of Education, Maharishi International University, Fairfield, Iowa, U.S.A., 1983.
Enhanced Cognitive-Moral Development; Benefits of Transcendental Meditation Further Enhanced by the TM-Sidhi Program.

271. HOLEMAN, R., and SEILER, G. Effects of sensitivity training and Transcendental Meditation on perception of others. *Perceptual and Motor Skills* 49: 270, 1979.
Improved Perception of Others.
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Greater Beneficial Effect from Transcendental Meditation Than from Other Meditation and Relaxation Procedures as Indicated by Meta-Analysis.
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Cumulative Benefits for Psychological Health: Decreased Nervousness; Decreased Depression; Decreased Emotional Instability; Decreased Manifest Anxiety.
274. TURNBULL, M. J., and NORRIS, H. Effects of Transcendental Meditation on self-identity indices and personality. *British Journal of Psychology* 73: 57–68, 1982.
Stronger Self-Identity.
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Decreased State and Trait Anxiety.

PART III: SOCIOLOGY

A: Rehabilitation

276. SHAFII, M.; LAVELY, R.; and JAFFE, R. Decrease in cigarette smoking following Transcendental Meditation. University of Michigan Medical School, Ann Arbor, Michigan, U.S.A. Findings previously published in *MERU Journal* 24: 29 (Abstract), 1976.
Decreased or Discontinued Use of Cigarettes.
277. GEISLER, M. Therapeutische Wirkungen der Transzendentalen Meditation auf Drogenkonsumenten. *Zeitschrift für klinische Psychologie* 7(4): 235–255, 1978.
Decreased Drug Abuse; Decreased Nervousness (Decreased Psychosomatic Disturbance)⁴; Decreased Depression (Increased Contentment, Increased Self-Confidence); Increased Sociability (Increased Friendliness, Increased

⁴ The terms in brackets are taken from the manual of the psychological test employed in order to clarify the characteristics measured by the test.

Liveliness); Increased Placidity (Increased Self-Assuredness, Increased Good Humor, Decreased Tendency to Procrastinate); Decreased Inhibition (Increases in: Naturalness, Spontaneity, Self-Sufficiency); Increased Extraversion (Increased Capacity for Warm Interpersonal Relationships); Decreased Neuroticism (Increased Emotional Stability, Decreased Tension); Increased Self-Reliance (Increased Effectiveness, More Balanced Mood, Increased Vigor).

278. ABRAMS, A. I., and SIEGEL, L. M. The Transcendental Meditation program and rehabilitation at Folsom State Prison: A cross-validation study. *Criminal Justice and Behavior* 5 (1): 3–20, 1978.
Rehabilitation of Prisoners: Decreased Anxiety; Decreased Neuroticism, Decreased Resentment; Decreased Negativism Decreased Irritability; Decreased Hostility; Decreased Prison Disciplinary Rule Infractions; Improved Sleep Patterns (Decreased Time to Fall Asleep, Decreased Awakenings per Night, Improved Quality of Sleep).
279. ABRAMS, A. I., and SIEGEL, L. M. Transcendental Meditation and rehabilitation at Folsom Prison: Response to a critique. *Criminal Justice and Behavior* 6(1): 13–21, 1979.
Verification of Results of Paper 278.
280. ABRAMS, A. I. A follow-up study of the effects of the Transcendental Meditation program on inmates at Folsom Prison. Maharishi International University, Fairfield, Iowa, U.S.A., 1982.
Rehabilitation of Prisoners: Sustained Reductions in Neuroticism, Anxiety, Hostility, and Use of Cigarettes; Improved Sleep Patterns (Decreased Time to Fall Asleep, Decreased Awakenings per Night).
281. CARTER, R., and MEYER, J. E. The use of the Transcendental Meditation (TM) technique with severely disturbed psychiatric inpatients. Institute for Social Rehabilitation, Pacific Palisades, Los Angeles, California, U.S.A., 1979.
Benefits for Psychiatric In-Patients: Marked Improvements in Schizophrenia, Manic-Depressive Psychosis, and Severe Personality Disorders; Decreased Anxiety and Tension.
282. NIDICH, S. I. The Science of Creative Intelligence and the Transcendental Meditation program: Reduction of drug and alcohol consumption. Department of Education, Maharishi International University, Fairfield, Iowa, U.S.A. Paper presented at the New England Educational Research Organization Conference, Lenox, Massachusetts, U.S.A., May 1980.
Decreased Use of Alcohol; Decreased Drug Abuse.
283. BIELEFELD, M. Transcendental Meditation: A stress reducing self-help support system. In *Vocational rehabilitation: Do Psychologists really belong?* Cleveland V.A. Medical Center, Cleveland, Ohio, U.S.A. Paper presented at the Annual Convention of the American Psychological Association, Los Angeles, California, U.S.A., 24 August 1981.

Benefits for Patients with Psychiatric and Addictive Disorders in a Vocational Rehabilitation Unit: Greater Ability to Maintain Employment on Discharge; More Frequently Maintained on Out-Patient Care Alone.

284. ALEXANDER, C. N., and MARKS, E. J. Ego development, personality and behavioral change in inmates practicing the Transcendental Meditation technique or participating in other programs: A summary of cross-sectional and longitudinal results. Doctoral thesis of first author (summary), Department of Psychology and Social Relations, Harvard University, Cambridge, Massachusetts, U.S.A., 1982. Rehabilitation of Prisoners: Greater Self-Development, Capacity for Warm Interpersonal Relationships, and Engagement in Private, Avocational Businesses; Lower Pathological Symptoms—Lower Psychopathic Deviation, Anxiety, Aggression, Tension, and Introversion; Growth toward Higher States of Consciousness; Longitudinal Increases in Self-Development and Decreases in Aggression, Anxiety, and Schizophrenic Symptoms.
285. ALEXANDER, C. N.; GRANT, J.; and STADTE, C. VON. The effects of the Transcendental Meditation technique on recidivism: A retrospective archival analysis. Doctoral thesis of first author (summary), Department of Psychology and Social Relations, Harvard University, Cambridge, Massachusetts, U.S.A., 1982. *Dissertation Abstracts International* 43 (1982): 539B. Rehabilitation of Prisoners: Lower Recidivism Rate; Fewer New Convictions.
286. BLEICK, C. R. Influence of the Transcendental Meditation program on criminal recidivism. Institute for Social Rehabilitation, Berkeley, California, U.S.A., 1982. Rehabilitation of Prisoners: Lower Recidivism Rate; Higher Incidence of Clean Records; Fewer New Convictions.
287. ARON, E. N., and ARON, A. The patterns of reduction of drug and alcohol use among Transcendental Meditation participants. *Bulletin of the Society of Psychologists in Addictive Behaviors* 2(1): 28–33, 1983. Decreased Use of Tobacco; Decreased Use of Alcohol; Decreased Use of Marijuana.
288. ARON, A., and ARON, E. N. Rehabilitation of juvenile offenders through the Transcendental Meditation program: A controlled study. *Journal of Crime and Justice*, in press. Rehabilitation of Juvenile Offenders: Decreased Anxiety.

PART IV: REVIEW PAPERS

A: Health

289. CLEMENTS, G., and CLEMENTS, D. M. The Transcendental Meditation and TM-Sidhi program and the reversal of ageing. Maharishi European Research University, Seelisberg, Switzerland. Rheinweiler, W. Germany: MERU Press, 1980.

Reversal of Aging.

290. BAUHOFER, U. Das Programm der Transzendentalen Meditation in der Behandlung von Adipositas. Maharishi European Research University, Seelisberg, Switzerland, 1983.

⁵Treatment of Obesity: More Successful Weight Reduction; Improved Psychological Health in Obese Subjects—Decreased Anxiety; Decreased Nervousness (Decreased Psychosomatic Disturbance); Decreased Aggressiveness (Increased Self-Control, Increased Emotional Maturity); Decreased Depression (Increased Contentment, Increased Self-Confidence); Increased Sociability (Increased Friendliness, Increased Liveliness); Increased Placidity (Increased Self-Assuredness, Increased Good Humor); Decreased Tendency to Dominate (Increased Respectfulness); Decreased Inhibition (Increases in Naturalness, Spontaneity, Self-Sufficiency); Increased Extraversion (Increased Capacity for Warm Interpersonal Relationships); Decreased Neuroticism (Increased Emotional Stability).

VOLUME 4

CHALMERS, R. A.; CLEMENTS, G.; SCHENKLUHN, H.; and WEINLESS, M., eds. 1989. *Scientific research on Maharishi's Transcendental Meditation and TM-Sidhi program: Collected papers, vol. 4*. Vlodrop, the Netherlands: MVU Press.

PART I: PHYSIOLOGY

The Studies in the First Two Sections Document Changes during the Practice of the Transcendental Meditation Technique Unless Otherwise Stated.

A: Metabolic, Biochemical, and Cardiovascular Changes

291. JEVNING, R.; WILSON, A. F.; O'HALLORAN, J. P.; and WALSH, R. N. Forearm blood flow and metabolism during stylized and unstylized states of decreased activation. *American Journal of Physiology* 245 (Regulatory, Integrative, and Comparative Physiology 14): R110–R116. 1983.
Indication of Deep Rest: Decreased Oxygen Consumption in Muscle Tissue.
Reduction in Biochemical Index of Stress: Decreased Arterial Lactate Levels.
292. JEVNING, R.; WILSON, A. F.; PIRKLE, H.; O'HALLORAN, J. P.; and WALSH, R. N. Metabolic control in a state of decreased activation: modulation of red cell metabolism. *American Journal of Physiology* 245 (Cell Physiol. 14): C457–C461, 1983.
Fundamental Change in Cellular Metabolism: Reduced Glucose Metabolism in

⁵Included in the research reviewed in this paper are findings which are not presented elsewhere in the Collected Papers, Volumes 1–4, and are therefore listed here.

Red Blood Cells. Normal Arterial Oxygen and Carbon Dioxide Partial Pressures. Reduction in Biochemical Index of Stress: Reduced Spontaneous Skin Resistance Responses.

293. WOLKOVE, N.; KREISMAN, H.; DARRAGH, D.; COHEN, C.; and FRANK, H. Effect of Transcendental Meditation on breathing and respiratory control. *Journal of Applied Physiology: Respiratory, Environmental and Exercise Physiology* 56(3): 607–612, 1984.

Decreased Minute Ventilation (Decreased Tidal Volume); Increased Basal Skin Resistance; Periodic Breath Suspension; Changes in Chemical and Neural Control of Breathing.

B: Electroencephalographic Changes

294. ORME-JOHNSON, D. W.; WALLACE, R. K.; DILLBECK, M. C.; ALEXANDER, C. N.; and BALL, O. E. Improved functional organization of the brain through the Maharishi Technology of the Unified Field as indicated by changes in EEG coherence and its cognitive correlates: A proposed model of higher states of consciousness. Departments of Psychology and Biology, Maharishi International University, Fairfield, Iowa, U.S.A.; Department of Psychology and Social Relations, Harvard University, Cambridge, Massachusetts, U.S.A.; and Department of Education, University of Georgia, Athens, Georgia, U.S.A. Paper presented at the American Psychological Society Annual Convention, Los Angeles, California, U.S.A., September 1981.

Increased Orderliness and Integration of Brain Functioning: Increased EEG Coherence. Correlations between Increased Frontal EEG Coherence and Increased Creativity; Correlations between Changes in EEG Coherence and Increased Grade Point Average, Increased Verbal Intelligence, Decreased Neuroticism, and Enhanced Principled Moral Reasoning.

295. MISZCZAK, J., and ACHIMOWICZ, J. Hybrid analysis of spontaneous brain activity in different states of conscious experience. Military Institute of Aviation Medicine, Warsaw, Poland. Results presented at the 5th Annual Meeting on EEG and Clinical Neurophysiology, Esztergom, Hungary, 1–9 October 1982.

Increased Orderliness and Integration of Brain Functioning: Synchronized High Amplitude Frontal EEG Theta Activity.

296. NIDICH, R.; NIDICH, S. I.; ORME-JOHNSON, D. W.; and WALLACE, R. K. EEG coherence and the length of practice of the Transcendental Meditation program. Departments of Education, Psychology, and Biology, Maharishi International University, Fairfield, Iowa, U.S.A., 1983.

Correlation between Length of Time Practising Transcendental Meditation and EEG Alpha Coherence.

297. NIDICH, S. I.; NIDICH, R., ABRAMS, A.; ORME-JOHNSON, D.; and WALLACE, R. K. Frontal lobe functioning: EEG coherence as a predictor of highly pro-social behavior in subjects practicing the Transcendental Meditation and TM-Sidhi

program. Departments of Education, Psychology, and Biology, Maharishi International University, Fairfield, Iowa, U.S.A., 1982.

Correlations between High Frontal EEG Coherence and Highly Pro-Social Behavior.

C: Health

298. ALLEN, C. P. Effects of Transcendental Meditation, electromyographic (EMG) biofeedback relaxation, and conventional relaxation on vasoconstriction, muscle tension, and stuttering: A quantitative comparison. Doctoral dissertation (abstract), University of Michigan, Ann Arbor, Michigan, U.S.A., 1979. *Dissertation International Abstracts*, 40: 689B.
Decreased Stuttering.
299. TABOGI, S. Effetti indotti dal programma di Meditazione Trascendentale sulla tolleranza glicidica. Unpublished doctoral dissertation (abbr.), Faculty of Medicine and Surgery, University of Trieste, Trieste, Italy, 1983.
Improved Blood Sugar Homeostasis as Measured by Oral Glucose Tolerance Test.
300. ALEXANDER, C. N.; DAVIES, J. L.; NEWMAN, R. I.; and CHANDLER, H. M. The effects of Transcendental Meditation on cognitive and behavioral flexibility, health, and longevity in the elderly: An experimental comparison of the Transcendental Meditation program, mindfulness training, and relaxation. Department of Psychology and Social Relations and Graduate School of Education, Harvard University, Cambridge, Massachusetts, U.S.A., and Macquarie University, North Ryde, New South Wales, Australia, 1983.
Benefits for the Elderly: Increased Longevity; Increased Cognitive and Perceptual Flexibility; Increased Behavioral Flexibility; Increased Learning Ability; Improved Mental Health and Sense of Well-Being; More Ideal Levels of Blood Pressure.

D: Motor and Perceptual Ability

301. SCHWARTZ, E. The effects of the Transcendental Meditation program on strength of the nervous system, perceptual reactance, reaction time, and auditory threshold. Master's thesis (abbr.), Department of Exercise Science, University of Massachusetts, Amherst, Massachusetts, U.S.A., 1979.
Increased Sensitivity, Strength, and Flexibility of the Nervous System; Improved Auditory Thresholds; Faster Reactions at High and Low Levels of Stimulation; Decreased Perceptual Reactance.
302. FRANCE, R. An investigation into the effects of Transcendental Meditation upon hearing threshold. North Staffordshire Polytechnic, Stoke on Trent, Staffordshire, England, 1983.
Improved Auditory Thresholds; Decreased Heart Rate.

PART II: PSYCHOLOGY

A: Intelligence, Learning, and Academic Performance

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Enrichment of Creativity and Appreciation in Artists.
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Maharishi International University: Increased Intelligence; Increased Field Independence.

B: Development of Personality

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Less Nervousness (Less Psychosomatic Disturbance)⁶; Less Aggressiveness (Greater Self-Control, Greater Emotional Maturity); Less Depression (Greater Contentment, Greater Self-Confidence); Less Irritability (Greater Calm in Frustrating Situations, Greater Tolerance); Greater Placidity (Greater Self-Assuredness, More Good Humor, Less Tendency to Procrastinate); Less Inhibition (Greater Naturalness, Greater Spontaneity, Greater Self-Sufficiency); Less Neuroticism (Greater Emotional Stability, Less Tension); More Relaxation; More Activation; More Elation; Less Anxiety; Less Fatigue; Less Physical Tension; Less Physical Weakness; Increased Physical Well-Being.
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⁶The terms in brackets are taken from the manual of the psychological test employed in order to clarify the characteristics measured by the test.

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Growth of Higher States of Consciousness. Experiences of Higher States of Consciousness Correlated with: Better Self-Concept (Greater Self-Actualization, Greater Internality of Locus of Control); Greater Creativity (Greater Fluency, Flexibility, and Originality); Profound Physiological Rest (Episodes of Spontaneous Breath Suspension during Transcendental Meditation); Greater Neurological Integration (High EEG Alpha and Theta Coherence); Greater Neurophysiological Efficiency (Faster H-Reflex Recovery); Superior Cognitive, Perceptual, and Motor Skills (Superior Perceptual Speed, Motor Speed, Psychomotor Speed and Flexibility, Nonverbal Intelligence, and Visual Memory); Less Symptoms of Stress (Lower Anxiety, Aggression, Depression, Introversiveness, and Neuroticism); Greater Capacity for Absorbing Experiences. (The correlates of higher states of consciousness summarized in this paper are drawn from both new experimental findings and the results of other studies reported in the volumes of this series.)

PART III: SOCIOLOGY

A. Rehabilitation

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Rehabilitation of Prisoners: Decreased Sleep Disturbance (Decreased Awakenings per Night, Decreased Time to Sleep Onset, Improved Quality of Sleep); Decreased Paranoid Anxiety; Increased Internality of Locus of Control; Decreased Hostility; Greater Control of Anger. Benefits for Correctional Staff: Decreased Sleep Disturbance; Decreased Hostility; Decreased Paranoid Anxiety.

B. Quality of Life

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Findings Reflecting Growth of Coherence in Collective Consciousness on City, State, Provincial, National, and International Levels

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319. DILLBECK, M. C. The Transcendental Meditation program and a compound probability model as predictors of crime rate change. Maharishi International University, Fairfield, Iowa, U.S.A., 1978.
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- Transcendental Meditation and TM-Sidhi program. Maharishi International University, Fairfield, Iowa, U.S.A., and Maharishi European Research University Research Institute, Mentmore, Buckinghamshire, England, 1983.
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Increased Harmony in International Affairs (Worldwide, 1978); Improvements in Domestic Affairs and International Relations for Major Trouble-Spot Countries (1978); Decreased War Deaths [Rhodesia (Now Zimbabwe), 1978].
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Improved Quality of National Life: Decreased Violent Crime; Decreased Motor Vehicle Fatalities; Decreased Number of Fatalities from Accidents, Suicide, and Homicide; Decreased Air Traffic Fatal Accidents; Increased Confidence, Optimism, and Economic Prosperity: Rise in Stock Market Index (U.S.A., 1979). Improved Quality of Provincial Life: Decreased Motor Vehicle Fatalities; Decreased Violent Crime (Massachusetts, USA, 1979); Decreased Air Traffic Fatal Accidents (New England, USA, 1979).
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332. ORME-JOHNSON, D. W., and GELDERLOOS, P. The long-term effects of the Maharishi Technology of the Unified Field on the quality of life in the United States (1960 to 1983). A version published in *Social Science Perspectives Journal* 2(4): 127–146, 1988.

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337. ORME-JOHNSON, D. W.; CAVANAUGH, K. L.; ALEXANDER, C. N.; GELDERLOOS, P.; DILLBECK, M.; LANFORD, A. G.; and ABOU NADER, T. M. The influence of

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PART IV: REVIEW PAPERS

Papers 338 to 355 review the application of the Transcendental Meditation and TM-Sidhi program in the areas of health, education, development of personality, rehabilitation, and quality of life.

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C: Personality

348. NIDICH, S. I., and ORME-JOHNSON, D. W. Kohlberg Stage 7, natural law, and the Transcendental Meditation and TM-Sidhi program. In *Proceedings of the International Symposium on Moral Education*, University of Fribourg, Fribourg, Switzerland, 3 September 1982.
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D: Rehabilitation

350. DEVAKAR. Correctional technique—A fresh approach through SCI. Department of Social Work, Kashi Vidyapeeth, Varanasi, Uttar Pradesh, India. Paper presented at the Third All India Penological Conference, Lucknow, Uttar Pradesh, India, 22–24 November 1975.
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E: Quality of Life

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PART I: PHYSIOLOGY

The Studies in the First Section Document Changes during the Practice of the Transcendental Meditation Technique Unless Otherwise Stated.

A: Metabolic, Biochemical, and Cardiovascular Changes

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More Efficient Neuroendocrine Regulation: Reduction of Pituitary Hormone TSH with Maintenance of Thyroid Hormones and Insulin Levels. Lower Baseline TSH Levels in Long-Term TM Participants.
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Neurotransmitter Modulation: Change in Daily Cycle of Urinary 5-Hydroxyindoles, Metabolites Related to Serotonin.
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Hormonal Growth: Increased Plasma Level of Arginine Vasopressin, Associated with Body Fluid Balance and with Learning and Memory.
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Improved Stress Reactivity: Lower Beta-Adrenergic Receptor Sensitivity; Lower Blood Reactivity to Stress; Lower Resting Blood Pressure; Lower Resting Epinephrine Level.
368. SCHNEIDER, R. H.; MILLS, P. J.; SCHRAMM, W.; and WALLACE, R. K. Luteinizing hormone: a marker for Type A behavior and its modification by the Transcendental Meditation program? *Psychosomatic Medicine* 49: 212–213, 1987. (Refer also to *Neuroendocrinology Letters* 9:181, 1987).
Lower Chronic Stress: Normal Neuroendocrine Reactivity; Meditating Type A Subjects Showed Healthy Neuroendocrine Pattern.

B: Electrophysiological and Electroencephalographic Changes

369. ALEXANDER, C. N.; LARIMORE, W. E.; DASH, P.; TITUS, B.; and ISRAELSON, L. Distinguishing between Transcendental Meditation, sleep and other forms of rest according to electrophysiological criteria. Summary of a paper presented at the Midwestern Psychological Association Meeting, Chicago, Illinois, May 1987.
EEG Differentiation between Transcendental Meditation and Napping.
370. GAYLORD, C.; ORME-JOHNSON, D.; and TRAVIS, F. The effects of the Transcendental Meditation technique and progressive muscle relaxation on EEG coherence, stress reactivity, and mental health in black adults. *International Journal of Neuroscience* 46: 77–86, 1989.
Increased Functional Organization of the Brain: Increased EEG Coherence during TM Practice. Improved Mental Health; Decreased Anxiety; Decreased Neuroticism; Faster Recovery from Stress.
371. GAYLORD, C.; ORME-JOHNSON, D.; WILLBANKS, M.; TRAVIS, F.; RAINFORTH, M.; and REYNOLDS, B. The effects of the Transcendental Meditation program on self-concept and EEG coherence in black college students. Abstract of paper presented at the 101st session of the Iowa Academy of Science, Storm Lake, Iowa, April 1989. Also see abstract insert in *Journal of the Iowa Academy of Science* 96(1), A31–A32.
Increased Functional Organization of the Brain: Increased EEG Coherence during TM Practice. Improved Self-Concept: Increased Self-Satisfaction; Increased Moral-Ethical Self; Increased Social Self; Decreased General Maladjustment; Decreased Personality Disorder.
372. DILLBECK, M. C., and ARAAS-VESELY, S. Participation in the Transcendental Meditation program and frontal EEG coherence during concept learning. *International Journal of Neuroscience* 29: 45–55, 1986.
Increased Frontal EEG Coherence during Acquisition of New Information; More Settled Physiological Response during Cognitively Demanding Tasks.
373. MEIRSMAN, J. Neurophysiological order in the REM sleep of participants of the Transcendental Meditation and TM-Sidhi programme. Summary of paper presented at the Sixth Annual International Conference of the Association for the Study of Dreams, London, England, July 1989.
Increased Order-Producing Activity of the Brain during Sleep as Indicated by the Ratio of High Frequency to Low Frequency REM.
374. GODDARD, P. H. Reduced age-related declines of P300 latency in elderly practicing Transcendental Meditation. *Psychophysiology* 26: S29, 1989.
Faster Processing of Cognitively Complex Information in the Elderly as Measured by Event-Related Potentials.
375. TRAVIS, F., and ORME-JOHNSON, D. W. EEG coherence and power during yogic flying. Abstract of a portion of the first author's doctoral dissertation, Department of Psychology, Maharishi International University, Fairfield, Iowa, 1988. (Refer

also to *Dissertation Abstracts International* 49(8): 3493B, 1988. Full paper published in *International Journal of Neuroscience*, 54: 1–12, 1990.

Increased EEG Coherence at the Moment of Performance of TM-Sidhi Yogic Flying.

C: Health

376. GLASER, J. L.; BRIND, J. L.; EISNER, M. J.; DILLBECK, M. C.; VOGELMAN, J. H.; and WALLACE, R. K. Elevated serum dehydroepiandrosterone sulfate levels in older practitioners of the Transcendental Meditation and TM-Sidhi programs. Paper presented at the Annual Meeting of the Society for Neuroscience, Washington, D.C., November 1986. An abstract of these results also appeared in *AGE* 10(4): 160, 1987.
Hormone Levels Indicating Younger Biological Age.
377. SMITH, D. E.; GLASER, J. L.; SCHNEIDER, R. H.; and DILLBECK, M. C. Erythrocyte sedimentation rate (ESR) and the Transcendental Meditation (TM) program. *Psychosomatic Medicine* 51: 259, 1989. (Also, refer to *AGE* 10(4): 160, 1987.
Lower Erythrocyte Sedimentation Rate Levels Indicating Less Serious Illness and Slower Aging.
378. ORME-JOHNSON, D. Medical care utilization and the Transcendental Meditation program. *Psychosomatic Medicine* 49(1): 493–507, 1987.
Lower Health Insurance Utilization Rates: Significantly Fewer Hospital Inpatient Days, Outpatient Visits; Fewer Inpatient Admissions for All Major Categories of Disease.
379. ORME-JOHNSON, D., and VEGORS, S. Medical care utilization at Maharishi International University, Fairfield, Iowa. Abstract of paper presented at the 100th Session, Iowa Academy of Science, Ames, Iowa, April 1988. Abstract insert in the *Journal of the Iowa Academy of Science* 95(1): A56.
Lower Health Insurance Utilization Rates among MIU Faculty and Staff.
380. ALEXANDER, C. N.; LANGER, E. J.; NEWMAN, R. I.; CHANDLER, H. M.; and DAVIES, J.L. 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, 1989.
Benefits for the Elderly Demonstrating Reversal of Aging: Increased Longevity; Increased Cognitive Flexibility (Including Increased Learning Ability and Greater Perceptual Flexibility); Increased Word Fluency; Improvements in Self-Reported Measures of Behavioral Flexibility and Aging; Greater Sense of Well-Being; Improved Mental Health; Reduction of Blood Pressure to More Ideal Levels.

PART II: PSYCHOLOGY

A: Intelligence, Learning, and Academic Performance

381. DOAN, M. J. Transcendental Meditation program as a prenatal factor in the quiet alert state in normal newborns. Summary of a paper presented at the Annual Meeting of the National Association of Young Children, Anaheim, California, November 1988.
Increased Quiet Alertness in Newborns of Mothers Practicing the Transcendental Meditation and TM-Sidhi Program.
382. DIXON, C. A. Consciousness and cognitive development: a six-month longitudinal study of four-year-olds practicing the children's Transcendental Meditation technique. Abstract of Doctoral Dissertation, Department of Psychology, Maharishi International University, Fairfield, Iowa, 1989. *Dissertation Abstracts International*, 51 (3) Section B: 1518, 1989.
Accelerated Cognitive Development in Four-Year-Old Children Practicing the Children's Transcendental Meditation Technique.
383. WARNER, T. Q. Transcendental Meditation and developmental advancement: mediating abilities and conservation performance. *Dissertation Abstracts International* 47(8): 3558B, 1986.
Advanced Cognitive Development in Children.
384. GELDERLOOS, P.; LOCKIE, R. J.; and CHUTTOORGOON, S. Field independence of students at Maharishi School of the Age of Enlightenment and a Montessori school. *Perceptual and Motor Skills* 65: 613–614, 1987.
Increased Field Independence (Growth of a More Stable Internal Frame of Reference, Increased Perceptual Acuity) in Children.
385. NIDICH, S. I.; NIDICH, R. J.; and RAINFORTH, M. School effectiveness: achievement gains at the Maharishi School of the Age of Enlightenment. *Education* 107: 49–54, 1986.
Increased Academic Achievement for Both Incoming and Continuing Students at Maharishi School of the Age of Enlightenment.
386. NIDICH, S. I., and NIDICH, R. J. Increased academic achievement at Maharishi School of the Age of Enlightenment: a replication study. *Education* 109(3): 302–304, 1989.
Improved Scores on Social Studies, Literary Materials, Reading, Quantitative Thinking, and General Academic Achievement for Students at Maharishi School of the Age of Enlightenment.
387. MUEHLMAN, J. M.; NIDICH, S. I.; REILLY, B.; and COLE, C. Relationship of the practice of the Transcendental Meditation technique to academic achievement. Paper presented at the Annual Meeting of the Mid-Western Educational Research Association, Chicago, Illinois, October 1988. (Refer also to *Abstracts of Papers of the Annual Meeting of the Mid-Western Educational Research Association*, p. 6, 1988.)

Increased Academic Achievement and IQ as a Function of Number of Months Practicing the Transcendental Meditation and TM-Sidhi Program in Secondary School Students.

388. NIDICH, R. J., and NIDICH, S. I. Improving the social climate of a Philippine secondary school through the practice of the Transcendental Meditation program. Summary of a paper presented at the Annual Meeting of the Mid-Western Educational Research Association, Chicago, Illinois, October 1988. (Refer also to *Abstracts of Papers of the Annual Meeting of the Mid-Western Educational Research Association*, p. 14, 1988.)
Increased Morale, Facilitative Leadership, and Influence in Decision Making Concerning Classroom Instruction in Teachers Practicing the Transcendental Meditation Program.
389. DILLBECK, M. C.; ASSIMAKIS, P. D.; RAIMONDI, D.; ORME-JOHNSON, D. W.; and ROWE, R. Longitudinal effects of the Transcendental Meditation and TM-Sidhi program on cognitive ability and cognitive style. *Perceptual and Motor Skills* 62: 731–738, 1986.
Increased Fluid Intelligence and Field Independence (Growth of a More Stable Internal Frame of Reference, Increased Perceptual Acuity) in College Students.
390. CRANSON, R. Increased general intelligence through the Transcendental Meditation and TM-Sidhi program. Abstract of a paper presented at the Annual Meeting of the American Psychological Association, New Orleans, August 1989.
Improvements in General Intelligence and Reaction-Time Measures (Which are Correlated with Intelligence).
391. KEMBER, P. The Transcendental Meditation technique and postgraduate academic performance. *British Journal of Educational Psychology* 55: 164–166, 1985.
Enhanced Academic Performance in Postgraduate Students.
392. JEDRCZAK, A.; BERESFORD, M.; and CLEMENTS, G. The TM-Sidhi program, pure consciousness, creativity and intelligence. *The Journal of Creative Behavior* 19(4): 270–275, 1985.
Enhanced Creativity and Intelligence.
393. JEDRCZAK, A.; TOOMEY, M.; and CLEMENTS, G. The TM-Sidhi programme, age, and brief test of perceptual-motor speed and nonverbal intelligence. *Journal of Clinical Psychology* 42: 161–164, 1986.
Reduction of Aging Effects as Assessed by Perceptual/Motor Speed and Non-Verbal Intelligence.

B: Development of Personality

394. GELDERLOOS, P.; GODDARD III, P. H.; AHLSTRÖM, H. H. B.; and JACOBY R. Cognitive orientation toward positive values in advanced participants of the TM and TM-Sidhi program. *Perceptual and Motor Skills* 64: 1003–1012, 1987.

Orientation toward Positive Values: Better Recall for Positive than Negative Words; Lower Recognition Thresholds for Positive Words than Negative Words; Differential Recognition Threshold for Positive and Negative Affect Terms Correlated with the Intensity of the Experienced Positive and Negative Affects; More Positive Appraisal of Others.

395. GELDERLOOS, P. Psychological health and development of students at Maharishi International University: a controlled longitudinal study. *Modern Science and Vedic Science* 1(4): 471–487, 1987.
Student Psychological Development: Increased Psychological Health as Indicated by Unifying Ability, Autonomy, Intrinsic Spirituality, Creativity, Directedness, Well-Being, and Integration of the Personality; Higher Growth Rate on Several of These Indicators.
396. GELDERLOOS, P.; HERMANS, H. J. M.; AHLSTRÖM, H. H.; and JACOBY, R. Transcendence and psychological health: studies with long-term participants of the Transcendental Meditation and TM-Sidhi program. *Journal of Psychology* 124(2), 177–197, 1990.
Psychological Development: Higher Scores on General Factor of Psychological Health; Higher Growth Rate Longitudinally; Scores on Psychological Health Associated with Physiological Indicators of Transcendental Consciousness.
397. GELDERLOOS, P., and BETO, Z. H. A. D. The Transcendental Meditation and TM-Sidhi program and reported experiences of transcendental consciousness. This is a summary of a study that appeared in *Psychologia—An International Journal of Psychology in the Orient* 32(2): 91–103, 1989.
Experiences of Higher States of Consciousness: More Frequent Experiences of Transcendental Consciousness.

PART III: SOCIOLOGY

A: Rehabilitation

398. BLEICK, C. R., and ABRAMS, A.I. The Transcendental Meditation program and criminal recidivism in California. *Journal of Criminal Justice* 15: 211–230, 1987.
Rehabilitation of Prison Inmates: Reduced Recidivism after Release.

B: Productivity and Quality of Life

399. ALEXANDER, C. N.; SWANSON, G. C.; RAINFORTH, M. V.; CARLISLE, T. W.; and TODD, C. C. The Transcendental Meditation program and business: a prospective study. Paper presented at the 101st Annual Session of the Iowa Academy of Science, Storm Lake, Iowa, April 1989. Refer also to abstract insert in *The Journal of the Iowa Academy of Science* 96: A32, 1989.
Increased Productivity and Performance in Business: Increased Efficiency and Productivity; Improved Work and Personal Relationships; Reduced Anxiety; Reduced Job Worry and Tension; Improved Job Satisfaction; Improved General

Health; Enhanced Sleep and Reduced Fatigue; Reduced Cigarette and Liquor Consumption; Increased Physiological Stability during Task Performance.

400. CHEN, M. E. A comparative study of dimensions of healthy functioning between families practicing the TM program for five years or for less than a year. *Dissertation Abstracts International* 45(10) 3206B, 1984.
Improved Family Life: Family Health.

The Following Papers in This Section Document the Growth of Coherence in the Collective Consciousness of Cities, States, Nations, and the World.

401. DILLBECK, M. C.; CAVANAUGH, K. L.; GLENN, T.; ORME-JOHNSON, D. W.; and 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(1): 67–104, 1987.
Improved Quality of Life in Cities and Territories: Decreased Crime (Union Territory of Delhi, 1980–1981; Metro Manila, 1984–1985; Puerto Rico, 1984). Improvements on Monthly Quality of Life Indices in Territories and States: Metro Manila Region, 1979–1981, Including Crime, Foetal Deaths, and Other Deaths; State of Rhode Island, U.S., 1978, Including Crime Rate, Motor Vehicle Fatality Rate, Mortality Rate for Other Causes, Auto Accident Rate, Unemployment Rate, Pollution, Beer Consumption Rate, and Cigarette Consumption Rate.
402. DILLBECK, M. C.; BANUS, C. B.; POLANZI, C.; and LANDRITH III, G. S. Test of a field model of consciousness and social change: the Transcendental Meditation and TM-Sidhi program and decreased urban crime. *The Journal of Mind and Behavior* 9(4): 457–486, 1988.
Improved Quality of City Life: Decreased Crime Rate (Cities and Metropolitan Areas, U.S., 1973–1979); Decreased Violent Crime (Washington, D.C., 1981–1983).
403. CAVANAUGH, K. L. Time series analysis of U.S. and Canadian inflation and unemployment: a test of a field-theoretic hypothesis. This is a revised and updated version of a paper presented at the Annual Meeting of the American Statistical Association, San Francisco, California, August 17–20, 1987, and published in *Proceedings of the American Statistical Association, Business and Economics Statistics Section* (Alexandria, Virginia: American Statistical Association): 799–804, 1987.
Improved Quality of National Life as Measured by a Monthly Index of Inflation and Unemployment (United States and Canada, 1979–1988).
404. CAVANAUGH, K. L., and KING, K. D. Simultaneous transfer function analysis of Okun's misery index: improvements in the economic quality of life through Maharishi's Vedic Science and technology of consciousness. Paper presented at the Annual Meeting of the American Statistical Association, New Orleans, Louisiana, August 22–25, 1988. An abridged version of this paper appeared in

Proceedings of the American Statistical Association, Business and Economics Statistics Section : 491–496, 1988.

Improved Quality of National Life as Measured by a Monthly Index of Inflation and Unemployment (United States, 1979–1988), Controlling for Monetary Growth and the Rate of Change of Crude Materials Prices.

405. CAVANAUGH, K. L.; KING, K. D.; and ERTUNA, C. A multiple-input transfer function model of Okun's misery index: an empirical test of the Maharishi Effect. Paper presented at the Annual Meeting of the American Statistical Association, Washington, D.C., August 6–10, 1989. An abridged version of this paper appears in *Proceedings of the American Statistical Association, Business and Economics Statistics Section* (Alexandria, Virginia: American Statistical Association): 565–570, 1989.

Improved Quality of National Life as Measured by a Monthly Index of Inflation and Unemployment (United States, 1979–1988), Controlling for the Rate of Change of Industrial Production, Crude Materials Prices, and a Measure of the Money Supply.

406. CAVANAUGH, K. L.; KING, K. D.; and TITUS, B. D. Consciousness and the quality of economic life: empirical research on the macroeconomic effects of the collective practice of Maharishi's Transcendental Meditation and TM-Sidhi program. This is a revised version of a paper presented at the Annual Meeting of the Midwest Management Society, Chicago, Illinois, March 1989, and published in R.G. Greenwood (ed.), *Proceedings of the Midwest Management Society* (Chicago, Illinois: Midwest Management Society): 183–190, 1989.

Improved Quality of National Life as Measured by a Monthly Index of Inflation and Unemployment (United States, 1979–1988), Controlling for Changes in Major Economic Variables.

407. DILLBECK, M. C. Test of a field theory of consciousness and social change: time series analysis of participation in the TM-Sidhi program and reduction of violent death in the U.S. Summary of a paper in *Social Indicators Research* 22: 399–418, 1990.

Improved Quality of National Life as Measured by a Weekly Index of Motor Vehicle Fatalities, Homicide, and Suicide (United States, 1979–1985).

408. ASSIMAKIS, P. D. Change in the quality of life in Canada: intervention studies of the effect of the Transcendental Meditation and TM-Sidhi program. Abstract published in *Dissertation Abstracts International* 50(5) Sec. B, p. 2203, November 1989.

Improved Quality of National Life: Improvements on a Weekly Index Including Motor Vehicle Fatalities, Homicide, and Suicide (Canada, 1983–1985); Reductions of Weekly Fatalities Due to Accidents Other than Motor Vehicle Fatalities (Canada, 1983–1985); Improvements on a Monthly Index Including Violent Fatalities (Motor Vehicle Fatalities, Homicide, and Suicide), Cigarette Consumption, and Worker-Days Lost in Strikes (Canada, 1972–1986).

409. GELDERLOOS, P.; FRID, M. J.; GODDARD, P. H.; XUE, X.; and LÖLIGER, S. A. 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): 80–94, 1988.
Improved International Relations: Increased Friendliness in Statements of U.S. Head of State (1985–1987).
410. DAVIES, J. L., and ALEXANDER, C. N. Alleviating political violence through enhancing coherence in collective consciousness: impact assessment analyses of the Lebanon war. Summary of a paper presented at the 85th Annual Meeting of the American Political Science Association, September 1989. (Refer also to *Dissertation Abstracts International* 49(8): 2381A, 1988.
Improved Quality of National Life: Reduction of Conflict in Lebanon (Increased Cooperation, Reduced Level of Conflict, Reduced War Fatalities, and Reduced War Injuries); Improvement on a Daily Index Composed of All Four of these Variables (1983–1985).
411. ORME-JOHNSON, D. W.; DILLBECK, M. C.; ALEXANDER, C. N.; CHANDLER, H. M.; and CRANSON, R. W. Time series impact assessment analysis of reduced international conflict and terrorism: effects of large assemblies of participants in the Transcendental Meditation and TM-Sidhi program. A summary of a paper presented at the Annual Conference of the American Political Science Association, Atlanta, Georgia, U.S.A., August 1989.
Improved International Relations: Reduced Conflict Globally, Reduced Terrorism, and Increase in World Index of Stock Prices, during Three Large Assemblies of Participants in the Transcendental Meditation and TM-Sidhi Program (1983–1985).

PART IV: THEORETICAL AND REVIEW PAPERS

A: Health

412. WALLACE, R. K.; FAGAN, J. B.; and PASCO, D. S. Vedic physiology. *Modern Science and Vedic Science* 2(1): 3–59, 1988.
The fundamental principle of Vedic Physiology is that consciousness is the basis of physiology. This paper outlines and reviews the expression of consciousness at each level of the physiology and reviews research on physiological correlates of higher states of consciousness developed through the Transcendental Meditation and TM-Sidhi program.
413. CHOPRA, D. Bliss and the quantum mechanical body. *Modern Science and Vedic Science* 2(1): 61–74, 1988.
The author outlines how the intelligence of the field of pure consciousness, the unified field of natural law, is expressed through the DNA and other levels of physiological functioning. The scientifically documented effects of the Transcendental Meditation program in balancing physiological functioning from the field of pure consciousness, and promoting subjective well-being, are

discussed.

414. JEDRCZAK, A.; MILLER, D.; and ANTONIOU, M. Transcendental Meditation and health: an overview of experimental research and clinical experience. *Health Promotion* 2(4): 369–376, 1988.

The authors review the large body of research indicating improved individual and collective health through the Transcendental Meditation program and propose that it be applied on a large scale to improve public health and reduce health care costs.

B: Education

415. DILLBECK, S. L., and DILLBECK, M. C. The Maharishi Technology of the Unified Field in education: principles, practice, and research. *Modern Science and Vedic Science* 1(4): 383–431, 1987.

The authors outline the principles and practical techniques of the Maharishi Unified Field Based Integrated System of Education and review research indicating the ability of this system to develop the cognitive, affective, and physiological characteristics of the student that contribute to successful learning.

416. NIDICH, S. I., and NIDICH, R. J. Holistic student development at Maharishi School of the Age of Enlightenment: theory and research. *Modern Science and Vedic Science* 1(4): 383–431, 1987.

The authors review research on the success of Maharishi Schools of the Age of Enlightenment in fostering positive educational outcomes and promoting student development.

417. DOW, M. A. A unified approach to developing intuition in mathematics. This paper is an abridged version of a paper presented to the Eugene Strens Memorial Conference on Intuitive and Recreational Mathematics and Its History, Calgary, July/August 1986. The original paper will appear in the proceedings of this conference, edited by Richard K. Guy, to be published by the Mathematical Association of America in their series MAA Notes.

This paper describes how the development of consciousness through the Transcendental Meditation program fulfills current needs in mathematics education by culturing mathematical intuition.

C: Personality and Development

418. ALEXANDER, C. N.; CRANSON, R. W.; BOYER, R. W.; and ORME-JOHNSON, D. W. Transcendental consciousness: a fourth state of consciousness beyond sleep, dreaming, and waking. This is an abridged version of a chapter which appeared in J. Gackenbach (ed.), *Sleep and Dreams: A Sourcebook*, New York: Garland Publishing, Inc., 282–315, 1986.

The authors review physiological research indicating that transcendental consciousness is a unique fourth major state of consciousness.

419. ALEXANDER, C. N.; DAVIES, J. L.; DIXON, C. A.; DILLBECK, M. C.; OETZEL, R. M.; DRUKER, S. M.; MUEHLMAN, J. M.; and ORME-JOHNSON, D. W. Growth of higher stages of consciousness: Maharishi's Vedic psychology of human development. A summary of a chapter appearing in Charles N. Alexander and Ellen J. Langer (eds.), *Higher Stages of Human Development: Perspectives on Adult Growth*. New York: Oxford University Press (1990).

The authors outline how the experience and understanding of higher states of consciousness found in Maharishi's Vedic Psychology fulfills the aspiration of developmental psychology to comprehend the full development of human life.

D: Rehabilitation

420. DILLBECK, M. C., and ABRAMS, A. I. The application of the Transcendental Meditation program to correction. *International Journal of Comparative and Applied Criminal Justice* 11(1): 111–132, 1987.

This paper reviews the research on the application of the Transcendental Meditation program in corrections, including improved mental health and reduced hostility among inmates, and reduced recidivism upon release. The authors propose the implementation of the Transcendental Meditation program in correctional settings on a large scale, in order to promote effective rehabilitation and thereby reduce the substantial financial and human costs to society of incarceration.

421. CLEMENTS, G.; KRENNER, L.; and MÖLK, W. The use of the Transcendental Meditation programme in the prevention of drug abuse and in the treatment of drug-addicted persons. *Bulletin on Narcotics* 40(1): 51–56, 1988.

This paper reviews the results of studies indicating that the practice of the Transcendental Meditation program reduces substance abuse.

E: Productivity and Quality of Life

422. ORME-JOHNSON, D. W., and DILLBECK, M. C. Maharishi's program to create world peace: theory and research. *Modern Science and Vedic Science* 1(2): 207–259, 1987.

This paper reviews Maharishi's theoretical principles of collective consciousness and the empirical research demonstrating improved quality of life at the city, state, national, and international levels. The research indicates that an influence of peace is created worldwide through the group practice of the Transcendental Meditation and TM-Sidhi program by at least 7000 individuals—the square root of one percent of the world's population.

F: Maharishi's Vedic Psychology

423. ORME-JOHNSON, D. W. The cosmic psyche: an introduction to Maharishi's Vedic psychology—the fulfillment of modern psychology. *Modern Science and Vedic Science* 2(2): 113–163, 1988.

This paper introduces basic concepts of Maharishi's Vedic Psychology and

compares its major principles to those of twentieth-century psychology. The author concludes that Maharishi's Vedic Psychology fulfills the theoretical and applied goals of psychology.

424. ORME-JOHNSON, D. 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(2): 165–221, 1988.
This paper presents the field of pure consciousness, or cosmic psyche, as the source of all mental and physical phenomena. The qualities of this field are verified through several approaches, including direct experience and scientific research.
425. DILLBECK, M. C. The self-interacting dynamics of consciousness as the source of the creative process in nature and in human life: the mechanics of individual intelligence arising from the field of cosmic intelligence—the cosmic psyche. *Modern Science and Vedic Science* 2(3): 245–278, 1988.
This paper outlines how, from the perspective of Maharishi's Vedic Psychology, the field of pure consciousness sequentially gives rise to the diversity of subjective and objective existence. Research is reviewed indicating that all levels of subjective life are enriched from their basis, pure consciousness, through the Transcendental Meditation and TM-Sidhi program.
426. ALEXANDER, C. N., and 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): 325–371, 1989.
This paper outlines the sequential unfoldment of higher states of consciousness brought to light by Maharishi and reviews the scientific research indicating the development of higher states through the Transcendental Meditation and TM-Sidhi program.
427. GELDERLOOS, P., and VAN DEN BERG, W. P. 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): 373–412, 1989.
This paper introduces Maharishi's TM-Sidhi program as the technique to enliven the self-interacting dynamics of consciousness in the awareness of the individual, thereby accelerating growth of higher states of consciousness; it also reviews the scientific research on the TM-Sidhi program.

G: Maharishi's Vedic Science and the Foundations of Mathematics and Physics

428. WEINLESS, M. The samhita of sets: Maharishi's Vedic Science and the foundations of mathematics. *Modern Science and Vedic Science* 1(2): 141–204, 1987.
This paper reviews basic concepts of set theory and other foundational perspectives in mathematics in relation to the central principles of Maharishi's Vedic Science.

429. HAGELIN, J. S. Is consciousness the unified field? A field theorist's perspective. *Modern Science and Vedic Science* 1(1): 29–87, 1987.
This paper presents an introduction to unified quantum field theories followed by a discussion of theory, research, and subjective experiences from Maharishi's Vedic Science, in which pure consciousness is described as the unified field of all the laws of nature.
430. HAGELIN, J. S. Restructuring physics from its foundation in light of Maharishi's Vedic Science. *Modern Science and Vedic Science* 3(1): 3–72, 1989.
The author proposes the renaming of the basic forces and particles of nature in light of their basis in the unified field; he outlines how Maharishi's Vedic Science brings fulfillment to this aspiration, and reviews research indicating that the unified field can be directly experienced and utilized by human awareness through the Transcendental Meditation and TM-Sidhi program.

SCIENTIFIC RESEARCH ON MAHARISHI'S TRANSCENDENTAL MEDITATION AND TM-SIDHI PROGRAMME: COLLECTED PAPERS, VOLUME 6

PART I: PHYSIOLOGY

A: Metabolic, Biochemical, and Cardiovascular Changes

Introduction to the Section

431 EFFECTS ON REGIONAL CEREBRAL BLOOD FLOW OF TRANSCENDENTAL MEDITATION

Ron Jevning, Ph.D.; Rajen Anand, Ph.D.; Mark Biedebach, Ph.D.; and Gene Fernando, M.B.A.

Increased Relative Blood Flow to the Brain in Frontal and Occipital Regions; Decreased Cerebrovascular Resistance Correlated with Increased Relative Cerebral Blood Flow; Increased Galvanic Skin Resistance; Increased Galvanic Skin Resistance Correlated with Increased Relative Cerebral Blood Flow

432 ELEVATED SERUM DEHYDROEPIANDROSTERONE SULFATE LEVELS IN PRACTITIONERS OF THE TRANSCENDENTAL MEDITATION (TM) AND TM- SIDHI PROGRAM

Jay L. Glaser, M.D.; Joel L. Brind, Ph.D.; Joseph H. Vogelmann, Ph.D.; Michael J. Eisner, M.D.; Michael C. Dillbeck, Ph.D.; R. Keith Wallace, Ph.D.; and Norman Orentreich, M.D.

Indications of Younger Biological Age: Increased DHEA-S Levels in Female and Older Male Practitioners of the Transcendental Meditation and TM-Sidhi Programme

433 BETA-ADRENERGIC RECEPTOR SENSITIVITY IN SUBJECTS PRACTICING TRANSCENDENTAL MEDITATION

Paul J. Mills, Ph.D.; Robert H. Schneider, M.D.; David Hill, Ph.D.; Kenneth G. Walton, Ph.D.; and R. Keith Wallace, Ph.D.

Decreased Sensitivity to Stress Hormones: Reduced Beta-Adrenergic Receptor Sensitivity

434 BETA-ADRENERGIC RECEPTOR SENSITIVITY, AUTONOMIC BALANCE AND SEROTONERGIC ACTIVITY IN PRACTITIONERS OF TRANSCENDENTAL MEDITATION

David Alan Hill, Ph.D.

Decreased Sensitivity to Stress Hormones: Reduced Beta-Adrenergic Receptor Sensitivity; More Stable Balance of the Physiology: Reduced Peripheral Serotonergic Activity Following Practice of the TM-Sidhi Programme; Length of Practice of the Transcendental Meditation Programme Correlated with Change in, and Lower Level of, Peripheral Serotonergic Activity

435 ACUTE IMMUNOREACTIVITY MODIFIED BY PSYCHOSOCIAL FACTORS: TYPE A/B BEHAVIOR, TRANSCENDENTAL MEDITATION AND LYMPHOCYTE TRANSFORMATION

Karen S. Blasdel, Ph.D.

Improved Immune Response to Stress: Faster Recovery of Baseline Immune Functioning Among Type A Subjects

436 INDOLE-MEDIATED ADAPTATION: DOES MELATONIN MEDIATE RESISTANCE TO STRESS IN HUMANS?

Kenneth G. Walton, Ph.D.; Gregory M. Brown, M.D., Ph.D.; Nirmal Pugh, B.S.; Christopher MacLean, M.S.; and Paul Gelderloos, S.Sc.D.

Lower Melatonin Turnover; Lower Levels of Melatonin Turnover Associated with Lower Stress

437 STRESS AND SEROTONIN TURNOVER IN NORMAL SUBJECTS: RELATION TO SEROTONIN DEFICIENCIES IN MENTAL DISORDERS

Kenneth G. Walton, Ph.D.; Paul Gelderloos, S.Sc.D.; Nirmal Pugh; Phil Macrae, B.S.; Phil Goddard, M.S.; Christopher MacLean, M.S.; and Debra Levitsky, M.S.

Higher Whole Body Serotonin Turnover; Less Mood Disturbance

438 MECHANISMS RELATING STRESS REDUCTION AND HEALTH: CHANGES IN NEUROENDOCRINE RESPONSES TO LABORATORY STRESS AFTER FOUR MONTHS OF TRANSCENDENTAL MEDITATION

Christopher Robin K. MacLean, Ph.D.

More Adaptive Biochemical Response to Stress: Decreased Baseline Cortisol and Decreased Overall Cortisol During Stress Session; Enhanced Cortisol Response During Stressful Challenge with Rapid Return to Baseline; Decreased TSH Response to Stress; Increased GH Response to Stress; Increased Testosterone Response to Stress. Decreased Plasma Serotonin Relative to Controls for Baseline, Average, and Response to Stress. (In

contrast to whole body serotonin metabolism, low plasma serotonin indicates decreased stress and decreased risk of high blood pressure. Low baseline cortisol and enhanced cortisol response to stress is a more stable and adaptive physiological profile.)

439 STRESS REDUCTION AND PREVENTING HYPERTENSION: PRELIMINARY SUPPORT FOR A PSYCHONEUROENDOCRINE MECHANISM

Kenneth G. Walton, Ph.D.; Nirmal D. C. Pugh, B.S.; Paul Gelderloos, S.Sc.D.; and Phil Macrae, B.S.

Endocrine Pattern Associated with Lower Stress: Lower Excretion of Cortisol and Aldosterone; Higher Excretion of Dehydroepiandrosterone Sulfate and Serotonin Metabolite 5-HIAA; Lower Excretion of Sodium, Calcium, Zinc, and Sodium/Potassium Ratio; Lower Anxiety; Less Mood Disturbance

440 CIRCADIAN RHYTHM ALTERATION BY A MENTAL TECHNIQUE FOR STRESS REDUCTION.

Jose Rafael Infante, M.D., Ph.D.; Francisco Samaniego, Ph.D.; Margarita Martinez, M.D.; Ana Roldan, M.D.; Marisa Hortas, M.D.; Eduardo Lopez, M.D.; Jose Castejon, M.D.; Rafael Poyatos, M.D.; and Fernando Peran, Ph.D.

Biochemical Indications of Decreased Stress: Lower Morning Levels of ACTH and Beta-endorphins

441 RELATIONSHIP BETWEEN SUBJECTIVE BLISS, 5-HYDROXY-3-INDOLEACETIC ACID AND THE COLLECTIVE PRACTICE OF MAHARISHI'S TRANSCENDENTAL MEDITATION AND TM-SIDHI PROGRAM

Sarah-Annelies Löliger, Ph.D.

Increased Serotonin Turnover, Increased Subjective Experience of Bliss, and Improved Quality of Night Sleep Correlated with the Size of a Group of TM-Sidhi Programme Participants; Quality of Experiences During the Transcendental Meditation and TM-Sidhi Programme Correlated with the Size of a Group of TM-Sidhi Programme Participants

B: Electrophysiological and Electroencephalographic Changes

Introduction to the Section

442 MOBILIZATION OF THE HIDDEN RESERVES OF THE BRAIN

Nicolai N. Lyubimov, Dr. Med. Sci.

Mobilization of Hidden Reserves of the Brain: Wider Distribution of Cortical Response to Somatosensory Stimuli

443 CEREBRAL CONTROL OF AFFERENT SOMATOSENSORY PROJECTIONS

Tatiana V. Orlova, Dr. Biol. Sci.; Elena V. Petrenko, Cand. Med. Sci.; and Nicolai N. Lyubimov, Dr. Med. Sci.

Increased Amplitude of Early Cortical and Brain Stem Responses to Somatosensory Stimuli

444 P300 UNDER CONDITIONS OF TEMPORAL UNCERTAINTY AND FILTER ATTENUATION: REDUCED LATENCY IN LONG-TERM PRACTITIONERS OF TM

Robert Cranson, Ph.D.; Phil Goddard, M.S.; David Orme-Johnson, Ph.D.; and Donald Schuster, Ph.D.

Faster Neurocognitive Processing: Reduced Latency of Auditory Brain Response (P300)

445 TRANSCENDENTAL MEDITATION AS AN INTERVENTION IN THE AGING OF NEUROCOGNITIVE FUNCTION: REDUCED AGE-RELATED DECLINES OF P300 LATENCIES IN ELDERLY PRACTITIONERS

Phil H. Goddard, Ph. D.

Preservation of Neurocognitive Processing Speed with Age: Faster Latency of Visual Evoked Potentials (P300)

446 ENDOGENOUS EVOKED POTENTIALS IN SUBJECTS PRACTICING TRANSCENDENTAL MEDITATION

Snjezana Miskov, M.D., Ph.D.

Increased Efficiency and Decreased Age-Related Deterioration of Cognitive Information Processing as Measured by Auditory Event-Related Potentials: Increased Amplitude and Decreased Latency of Brain Potentials (P300) Correlated with Length of Time Practicing Transcendental Meditation; Greater Amplitude of Response Prior to Transcendental Meditation in Comparison to Controls; Shorter Latency of Response Following Transcendental Meditation in Comparison to Before; Shorter Latency of Response Following Transcendental Meditation in Comparison to Controls

447 P300 LATENCY AND AMPLITUDE DURING EYES-CLOSED REST AND TRANSCENDENTAL MEDITATION PRACTICE

Frederick Travis, Ph.D.; and Snjezana Miskov, M.D., Ph.D.

Improved Efficiency of Information Transfer in the Brain: Shorter Latencies of Auditory Evoked Potentials (P300) Following Transcendental Meditation

448 EEG ANALYSIS DURING MEDITATION: A LITERATURE REVIEW AND EXPERIMENTAL STUDY

Dr. med. Wulf Splittstoesser

EEG Indications of Restful Alertness: Low or High Amplitude Theta Activity Alternating with Basic Alpha Activity; Isolated Delta Waves with Occasional Overlap by Fast Frequencies; High Amplitude Theta Bursts; Increased Intrahemispheric Coherence in the Alpha and Theta Frequency Bands

449 EYES OPEN AND TM EEG PATTERNS AFTER ONE AND EIGHT YEARS OF TM PRACTICE

Frederick Travis, Ph.D.

Higher Eyes-Open Frontal-Central EEG Coherence in Long-Term Participants in the Transcendental Meditation Programme; Increased Frontal Alpha EEG Activity and Periodic Theta-Alpha Bursts During the Practice of Transcendental Meditation for both Short-Term and Long-Term Participants

450 THE DYNAMIC CHARACTERISTICS OF MODIFIED CONSCIOUSNESS DURING AND AFTER TRANSCENDENTAL MEDITATION

Evgeni N. Istratov, Cand. Biol. Sci.; Nicolai N. Lyubimov, Dr. Med. Sci.; and Tatiana V. Orlova, Dr. Biol. Sci.

EEG Indications of Restful Alertness: Increased Stability of Alpha Activity, Increased Beta Power, and Reduced Slow-Wave Delta and Theta Power During Transcendental Meditation; Persistence of EEG Changes Following Transcendental Meditation

451 COMPARATIVE ANALYSIS OF ALPHA RHYTHM CONTENT IN SPONTANEOUS EEG ACTIVITY AMONG SUBJECTS PRACTISING THE TRANSCENDENTAL MEDITATION TECHNIQUE

Evgeni N. Istratov, Cand. Biol. Sci.; and Sergei N. Lyubimov, Cand. Med. Sci.

EEG Indications of Restful Alertness: High Frontal EEG Alpha Power During Transcendental Meditation; Stabilization of Frontal EEG Alpha Power Outside the Practice of Transcendental Meditation

452 EEG RELATIVE ALPHA POWER DURING YOGIC FLYING

David W. Orme-Johnson, Ph.D.; and Paul Gelderloos, S.Sc.D.

Stabilized Restful Alertness: EEG Alpha Power During TM-Sidhi Yogic Flying

453 EEG COHERENCE AND POWER DURING YOGIC FLYING

Frederick T. Travis, Ph.D.; and David W. Orme-Johnson, Ph.D.

Increased EEG Coherence and Power Immediately before the Body Lifted up during TM-Sidhi Yogic Flying

454 AN EMPIRICAL TEST OF MAHARISHI'S JUNCTION POINT MODEL OF STATES OF CONSCIOUSNESS

Frederick T. Travis, Ph.D.

Indication of Pure Consciousness at the Transition between Waking and Sleeping: EEG Alpha Activity in the Frontal Cortex; Increased Duration of Frontal Alpha Activity During Transcendental Meditation

455 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 PSYCHOPHYSIOLOGIC STATE

Frederick Travis, Ph.D.

Indication of Pure Consciousness at the Transition Between Waking, Sleeping, and Dreaming: Increased EEG Theta/Alpha Power

456 ELECTROPHYSIOLOGICAL CORRELATES OF HIGHER STATES OF CONSCIOUSNESS DURING SLEEP

Lynne Mason, Ph.D.; Charles N. Alexander, Ph.D.; Fredrick T. Travis, Ph.D.; David W. Orme-Johnson, Ph.D.; Jayne Gackenbach, Ph.D.; Gail Marsh, Ph.D.; Kenneth Walton, Ph.D.; and Maxwell Rainforth, M.S., M.A.

Experience of Pure Consciousness During Sleep: Increased EEG Theta/Alpha Power During Deep Sleep; Decreased EMG Activity During Deep Sleep; Increased REM Density During REM Sleep; More Frequent Reports of Higher States of Consciousness

C: Health

Introduction to the Section

457 TRANSCENDENTAL MEDITATION, MINDFULNESS, AND LONGEVITY: AN EXPERIMENTAL STUDY WITH THE ELDERLY.

Charles N. Alexander, Ph.D.; Ellen J. Langer, Ph.D.; Ronnie I. Newman, M.Ed.; Howard M. Chandler, M.S.; and John L. Davies, Ph.D.

Benefits for the Elderly Demonstrating Reversal of Ageing: Increased Longevity (Higher Survival Rate); Reduction of Systolic Blood Pressure to More Ideal Levels; Improved Mental Health (Improvements on Nurses' Mental Health Ratings); Increased Cognitive Flexibility (Verbal Task); Increased Learning Ability (Paired Associate Learning Task); Improvements in Self-Reported Measures of Behavioural Flexibility and Ageing (Greater Ability to Cope with Inconvenience, Reduced Feelings of Being Old); Greater Sense of Well-Being (Feeling Better and More Relaxed After Transcendental Meditation; Feeling Better During Transcendental Meditation; High Interest in Transcendental Meditation; and High Ratings of the Value of Transcendental Meditation)

458 A RANDOMIZED CONTROLLED TRIAL OF STRESS REDUCTION ON CARDIOVASCULAR AND ALL-CAUSE MORTALITY IN THE ELDERLY: RESULTS OF 8 YEAR AND 15 YEAR FOLLOW-UPS

Charles Alexander, Ph.D.; Vernon Barnes, Ph.D.; Robert Schneider, M.D.; Ellen Langer, Ph.D.; Ronnie Newman, M.Ed.; Howard Chandler, Ph.D.; John Davies, Ph.D.; and Maxwell Rainforth, M.S., M.A.

Benefits for the Elderly: Increased Longevity (Higher Survival Rate); Higher Survival Rate Among Those with Cardiovascular Mortality

459 A RANDOMIZED CONTROLLED TRIAL OF STRESS REDUCTION FOR HYPERTENSION IN OLDER AFRICAN AMERICANS

Robert H. Schneider, M.D.; Frank Staggers, M.D.; Charles N. Alexander, Ph.D.; William Sheppard, Ph.D.; Maxwell Rainforth, M.S., M.A.; Kofi Kondwani, M.S.; Sandra Smith, Ph.D.; and Carolyn Gaylord King, Ph.D.

More Ideal Levels of Blood Pressure in Hypertensive Subjects: Reduction of High Systolic and Diastolic Blood Pressure

460 TRIAL OF STRESS REDUCTION FOR HYPERTENSION IN OLDER AFRICAN AMERICANS: II. SEX AND RISK SUBGROUP ANALYSIS

Charles N. Alexander, Ph.D.; Robert H. Schneider, M.D.; Frank Staggers, M.D.; William Sheppard, Ph.D.; B. Mawiyah Clayborne, Ph.D.; Maxwell Rainforth, M.S., M.A.; John Salerno, Ph.D.; Kofi Kondwani, M.S.; Sandra Smith, Ph.D.; Kenneth G. Walton, Ph.D.; and Brent Egan, M.D.

More Ideal Levels of Blood Pressure in Hypertensive Subjects who Learned the Transcendental Meditation Programme: Reduction of High Systolic and Diastolic Blood Pressure Found for both Men and Women, and both High and Low Psychosocial Stress Subjects; Reduction of High Systolic and Diastolic Blood Pressure Irrespective of Score on Five Other Measures of Risk for High Blood Pressure—Obesity, Alcohol Use,

Physical Inactivity, Dietary Sodium-Potassium Intake, and Index of All Risk Factors Combined

461 THE EFFECT OF TRANSCENDENTAL MEDITATION ON AMBULATORY BLOOD PRESSURE AND CARDIOVASCULAR REACTIVITY

Stig R. Wenneberg, M.S.; Robert H. Schneider, M.D.; Christopher R. K. MacLean, M.S.; Debra K. Levitsky, M.S.; Kenneth G. Walton, Ph.D.; Joseph Mandarino, Ph.D.; and Rafiq Waziri, M.D.

More Ideal Levels of Blood Pressure in Normotensive Subjects: Decreased Mean Diastolic Ambulatory Blood Pressure; Maintenance of Blood Pressure Reactivity.

462 COST-EFFECTIVE HYPERTENSION MANAGEMENT: COMPARISON OF DRUG THERAPIES WITH AN ALTERNATIVE PROGRAM

Robert E. Herron, Ph.D.; Robert H. Schneider, M.D.; Joseph V. Mandarino, Ph.D.; Charles N. Alexander, Ph.D.; and Kenneth Walton, Ph.D.

Greater Cost-Effectiveness for Hypertension Management through Transcendental Meditation Programme in Comparison to Drug Therapies

463 USEFULNESS OF THE TRANSCENDENTAL MEDITATION PROGRAM IN THE TREATMENT OF PATIENTS WITH CORONARY ARTERY DISEASE

John W. Zamarra, M.D.; Robert H. Schneider, M.D.; Italo Besseghini, M.D.; Donald K. Robinson, M.S.; and John W. Salerno, Ph.D.

Improved Cardiovascular Functioning in Patients with Coronary Artery Disease: Improved Exercise Tolerance (Increased Exercise Duration; Increased Maximal Workload; Greater Delay of Onset of ST Depression; Greater Reduction of Rate-Pressure Product During Exercise)

464 TRANSCENDENTAL MEDITATION AND THREE CASES OF MIGRAINE

H. David Lovell-Smith, B.A, M.B., Ch.B.

Reduced Frequency and Severity of Migraine Headache

465 MONITORING BEHAVIOURAL STRESS CONTROL USING A CRANIOMANDIBULAR INDEX

R. M. Shaw, B.D.Sc., M.Sc.; and D. M. Dettmar, B.D.Sc.

Reduction of craniomandibular stress

466 EFFECTS OF TRANSCENDENTAL MEDITATION (TM) ON THE MENTAL HEALTH OF INDUSTRIAL WORKERS

Takashi Haratani, Ph.D.; and Takemitsu Hemmi, M.D., Ph.D.

Improvements in General Physical and Mental Well-Being in Industrial Workers: Decreased Physical Complaints; Decreased Impulsive Tendency; Reduced Emotional Instability; Decreased Neurotic Tendency; Decreased Anxiety

467 EFFECTS OF TRANSCENDENTAL MEDITATION (TM) ON THE HEALTH BEHAVIOUR OF INDUSTRIAL WORKERS

Takashi Haratani, Ph.D.; and Takemitsu Hemmi, M.D., Ph.D.

Improved Sleep and Decreased Smoking in Industrial Workers: Decreased Time to Fall Asleep; Reduced Waking During the Night; Decreased Percentage of People Smoking; Fewer Cigarettes Smoked per Day

468 THE ROLE OF THE TRANSCENDENTAL MEDITATION TECHNIQUE IN PROMOTING SMOKING CESSATION: A LONGITUDINAL STUDY

Ann Royer, Ph.D.

Decreased Cigarette Consumption; Increased Smoking Quit Rate Over a Two-Year Period

469 THE IMPACT OF TRANSCENDENTAL MEDITATION PRACTICE ON MEDICAL EXPENDITURES

Robert E. Herron, Ph.D.

Decreased Payments for Physicians' Services; Greatest Savings for Elderly and High Medical Cost People

470 THE IMPACT OF THE TRANSCENDENTAL MEDITATION PROGRAM ON GOVERNMENT PAYMENTS TO PHYSICIANS IN QUEBEC

Robert E. Herron, Ph.D.; Stephen L. Hillis, Ph.D.; Joseph V. Mandarino, Ph.D.; David W. Orme-Johnson, Ph.D.; and Kenneth G. Walton, Ph.D.

Decreased Payments for Physicians' Services

PART II: PSYCHOLOGY

A: Intelligence, Learning, and Academic Performance

471 TRANSCENDENTAL MEDITATION AND IMPROVED PERFORMANCE ON INTELLIGENCE-RELATED MEASURES: A LONGITUDINAL STUDY

Robert W. Cranson, Ph.D.; David W. Orme-Johnson, Ph.D.; Jayne Gackenbach, Ph.D.; Michael C. Dillbeck, Ph.D.; Christopher H. Jones, Ed.D.; and Charles N. Alexander, Ph.D.

Increased General Intelligence: Improved Intelligence Test Performance; Improvement in Reaction Time Measures Correlated with General Intelligence (Faster Choice Reaction Time, Lower Standard Deviation of Choice Reaction Time); Faster Simple Reaction Time

472 VEDIC SCIENCE BASED EDUCATION AND NONVERBAL INTELLIGENCE: A PRELIMINARY LONGITUDINAL STUDY IN CAMBODIA

Lee C. Fergusson, Ph.D.; Anna J. Bonshek, M.A.; and Gildas Le Masson, M.A.

Increased Nonverbal Intelligence

473 TESTING AND DEVELOPING HOLISTIC INTELLIGENCE IN CHINESE CULTURE WITH MAHARISHI'S VEDIC PSYCHOLOGY: THREE EXPERIMENTAL REPLICATIONS USING TRANSCENDENTAL MEDITATION

So Kam-Tim, Ph.D.

Increased Creativity; Increased Fluid Intelligence; Decreased Inspection Time (Increased Speed of Information Processing); Increased Field Independence; Increased Constructive Thinking; Decreased Anxiety.

474 COGNITIVE AND SELF DEVELOPMENT AMONG URBAN CHILDREN PARTICIPATING IN AN AFTER-SCHOOL EDUCATIONAL PROGRAM

Michael C. Dillbeck, Ph.D.; Horus I. Msemaje, M.S.; B. Mawiyah Clayborne, Ph.D.; and Susan L. Dillbeck, Ph.D.

Increased Analytical Ability; Increased General Intellectual Performance; Improved Self Concept

475 FIELD INDEPENDENCE AND ART ACHIEVEMENT IN MEDITATING AND NONMEDITATING COLLEGE STUDENTS

Lee C. Fergusson, Ph.D.

Higher Level of Field Independence; Field Independence Correlated with Artistic Ability and College Academic Performance

476 FIELD INDEPENDENCE, TRANSCENDENTAL MEDITATION AND ACHIEVEMENT IN COLLEGE ART: A REEXAMINATION

Lee C. Fergusson, Ph.D.

Higher Level of Field Independence; Correlation of Field Independence with Artistic Ability, Self-Perceived Artistic Competence, and College Academic Performance

B: Development of Personality

477 TRANSCENDENTAL MEDITATION, SELF-ACTUALIZATION, AND PSYCHOLOGICAL HEALTH: A CONCEPTUAL OVERVIEW AND STATISTICAL META-ANALYSIS

Charles N. Alexander, Ph.D.; Maxwell V. Rainforth, M.S., M.A.; and Paul Gelderloos, S.Sc.D.

Increased Self-Actualization through Transcendental Meditation in Contrast to Other Procedures as Demonstrated by Meta-Analysis; Improvement in the Measured Components of Self-Actualization: Increased Time Competence (Ability to Live in the Present; Ability to Connect Past, Present, and Future Meaningfully); Increased Inner-Directedness (Independence; Self-Supportiveness); Increased Self-Actualizing Value (Holding Values of Self-Actualizing People); Increased Existentiality (Flexibility in Application of Values); Increased Spontaneity; Increased Self-Regard; Increased Self-Acceptance; Increased Nature of Man Constructive (Sees Man as Essentially Good); Increased Synergy (Sees Opposites of Life as Meaningfully Related); Increased Acceptance of Feelings; Increased Capacity for Intimate Contact (Warm Interpersonal Relationships); Increased Emotional Maturity; Increased Integrative Perspective on Self and World; Increased Resilient Sense of Self

478 TRANSCENDENTAL MEDITATION AND AWAKENING WISDOM: A 10-YEAR LONGITUDINAL STUDY OF SELF DEVELOPMENT

Howard M. Chandler, Ph.D.

Growth of Wisdom: Increased Ego Development; Increased Principled Moral Reasoning; Increased Motivation for Warm Interpersonal Relationships

479 TRANSCENDENTAL MEDITATION, ADAPTATION MECHANISMS AND VALUATIONS

Henry H. B. Ahlström, Ph.D.

Increased Orientation Towards Positive Values; Increased Psychological Health

480 PERSONALITY AND HEALTH CHARACTERISTICS OF CAMBODIAN UNDERGRADUATES: A CASE FOR STUDENT DEVELOPMENT

Lee C. Fergusson, Ph.D.; Anna J. Bonshek, M.A.; and Jean-Michel Boudigues, M.A.

Improved Mental and Physical Health: Decreased State Anxiety; Decreased Trait Anxiety; Decreased Depression; Increased Self-Esteem; Improved General Health

PART III: SOCIOLOGY

A: Rehabilitation

481 TREATING AND PREVENTING ALCOHOL, NICOTINE, AND DRUG ABUSE THROUGH TRANSCENDENTAL MEDITATION: A REVIEW AND STATISTICAL META-ANALYSIS

Charles N. Alexander, Ph.D.; Pat Robinson, Ph.D., O.T.R.; and Maxwell Rainforth, M.S., M.A.

Results of Integrative Meta-Analysis: Significantly Greater Reduction in Use of Illegal Drugs, Alcohol, and Cigarettes than Programmes of Relaxation, Prevention, or Treatment; Abstinence from Illegal Drugs, Alcohol, and Cigarettes Maintained or Increased over Long Term (Relapse Prevention); Improved Psychological Health (Reduced Negative Qualities, Reduced Anxiety, Improved Positive Qualities) Among Those with Substance Abuse Problems in Comparison to Controls

482 CASE STUDY OF THE TRANSCENDENTAL MEDITATION PROGRAMME IN THE NATIONAL PRISON SYSTEM OF SENEGAL

Jean-Michel Boudigues, M.A.

Case Study Benefits for Inmates: Sharp Reduction in Negativity, Irritability and Aggressiveness; Improved Relations Between Inmates; Improvement in Health; Marked Decrease in Drug Consumption; Improvement in Sleep; Greater Confidence and Joyfulness. Case Study Benefits for Staff: Greater Self-Confidence; Greater Concern for Inmates; Greater Self-Control; Greater Conscientiousness; Improved health; Decreased Absenteeism and Lateness. Case Study Benefits for Prison: Almost Complete Cessation of Fights Between Inmates; Sharp Decrease in the Number of Medical Consultations; Marked Decrease in Rule Violations by Inmates and Staff; Fewer Escapes. Case Study Benefits for the Nation: Reduced National Recidivism; Increased and More Balanced Rainfall and Increased Harvests

B: Productivity and Quality of Life

483 EFFECTS OF THE TRANSCENDENTAL MEDITATION PROGRAM ON STRESS REDUCTION, HEALTH, AND EMPLOYEE DEVELOPMENT: A PROSPECTIVE STUDY IN TWO OCCUPATIONAL SETTINGS

Charles N. Alexander, Ph.D.; Gerald C. Swanson, Ph.D.; Maxwell V. Rainforth, M.S., M.A.; Thomas W. Carlisle, M.S.; Christopher C. Todd, M.B.A.; and Robert M. Oates, Jr., M.A.

Increased Employee Effectiveness; Increased Job Satisfaction; Improved Personal and Work Relationships; Reduced Job Worry and Tension; Reduced Trait Anxiety; Decreased Insomnia and Decreased Fatigue; Reduced Cigarette and Hard Liquor Use; Improved Health; Greater Calm (Lower Skin Conductance) During Task Performance; Improvement on Common Factors Underlying each of these Measures (Occupational Coherence, Physiological Settledness, Satisfaction with Professional and Personal Life)

484 EFFECTS OF THE TRANSCENDENTAL MEDITATION PROGRAM ON PSYCHOLOGICAL, PHYSIOLOGICAL, BEHAVIORAL, AND ORGANIZATIONAL CONSEQUENCES OF STRESS IN MANAGERS AND EXECUTIVES

David L. De Armond, Ph.D.

Benefits for Managers: Increased Contribution to the Organization; Improved Mental Health; Increased Vitality; More Healthy Behaviours; Decreased Perceived Stress; Decreased Physical Complaints; Decreased Serum Cholesterol

485 INTRODUCING IN A MILITARY ACADEMY THE TRANSCENDENTAL MEDITATION PROGRAM FOR PREVENTION OF STRESS

Dra. Maria de Fatima Campos Belham

Benefits for Military Cadets: Increased Capacity of Attention; Improved Memory of Details; Increased Effectiveness in Executing Orders; Improved Emotional Performance; Increased Physical Strength (Push-ups); Reduced Resting Heart Rate. Benefits for Officers: Increased Concentration of Attention; Improved Memory of Details; Improved Emotional Performance

486 IMPLEMENTING THE TRANSCENDENTAL MEDITATION PROGRAMME IN THE BRAZILIAN MILITARY POLICE FORCES: A CASE STUDY

Jose Luis Alvarez Roset and Markus Schuler

Benefits for Police Officers: Decreased Disciplinary Problems; Decreased Doctor Visits; Improved Community Relations. Benefits for Police Officer Trainees: Better Physical Well-Being; Greater Relaxation; Less Worry and Tension; Greater Capacity for Study; Improved Relationships; Greater Respect for Country and Organizations; Enhancement of Military Education; Decreased Disciplinary Problems; Decreased Doctor Visits.

487 RELATIONSHIP BETWEEN PARTICIPATION IN TRANSCENDENTAL MEDITATION AND THE FUNCTIONALITY OF MARRIAGE

Vicki Jean Broome, M.Ed.(Psych), M.S.C.I.

Improved Marital Functionality: Overall Greater Positive Couple Agreement, and Greater Agreement on Marital Satisfaction, Personality Issues, Communication, Conflict Resolution, Financial Management, Children, Family and Friends, Religious Orientation, Marital Cohesion, and Marital Adaptability

**The Following Papers in This Section Document the Growth of Coherence
in the Collective Consciousness of States, Nations and the World.**

**488 THE MAHARISHI EFFECT: A MODEL FOR SOCIAL IMPROVEMENT. TIME
SERIES ANALYSIS OF A PHASE TRANSITION TO REDUCED CRIME IN
MERSEYSIDE METROPOLITAN AREA.**

*Guy D. Hatchard, M.A.; Ashley J. Deans, Ph.D.; Kenneth L. Cavanaugh, Ph.D.; and
David W. Orme-Johnson, Ph.D.*

Improved Quality of City Life: Decreased Crime Rate (Merseyside, England, 1988–1991)

**489 EFFECTS OF GROUP PRACTICE OF THE TRANSCENDENTAL MEDITATION
PROGRAM ON PREVENTING VIOLENT CRIME IN WASHINGTON, DC:**

RESULTS OF THE NATIONAL DEMONSTRATION PROJECT, JUNE–JULY 1993

*John S. Hagelin, Ph.D.; Maxwell V. Rainforth, M.S., M.A.; David W. Orme-Johnson,
Ph.D.; Kenneth L. Cavanaugh, Ph.D.; Charles N. Alexander, Ph.D.; Susan F. Shatkin,
M.A.; John L. Davies, Ph.D.; Anne O. Hughes, Ph.D.; and Emanuel Ross. Summary of a
paper to appear in *Social Indicators Research*.*

Improved Quality of City and National Life as Measured by Decreased Violent Crime
Rate in the National Capital (Washington, DC, USA, June and July, 1993)

**490 IMPROVED QUALITY OF LIFE IN IOWA THROUGH THE MAHARISHI
EFFECT**

Dori Lou Reeks, Ph.D.

Improved Quality of State Life: Reduced Unemployment; Decreased Traffic Fatalities;
Decreased Crime Rate; Increase of a Quality of Life Index Including All Three Variables
(Iowa, USA, 1979–1986)

**491 WHAT DOES THE MAHARISHI TECHNOLOGY OF THE UNIFIED FIELD
MEAN FOR SOCIAL WORK? A STUDY IN AUSTRALIA**

Sandy Gowing Price, B.S.W.(Hons.).

Improved Quality of National Life: Reduced Fatal Traffic Accidents; Reduced
Unemployment; Increased Value of Stock Market Index (Australia, January 1983)

**492 TEST OF A FIELD THEORY OF CONSCIOUSNESS AND SOCIAL CHANGE:
TIME SERIES ANALYSIS OF PARTICIPATION IN THE TM-SIDHI PROGRAM
AND REDUCTION OF VIOLENT DEATH IN THE U.S.**

Michael C. Dillbeck, Ph.D.

Improved Quality of National Life: Improvement on a Weekly Index Including Motor
Vehicle Fatalities, Homicide, and Suicide (United States, 1982–1985)

**493 TIME SERIES ANALYSIS OF IMPROVED QUALITY OF LIFE IN CANADA:
SOCIAL CHANGE, COLLECTIVE CONSCIOUSNESS, AND THE TM-SIDHI
PROGRAM**

Panayotis D. Assimakis, Ph.D.; and Michael C. Dillbeck, Ph.D.

Improved Quality of National Life: Improvements on a Weekly Index Including Motor
Vehicle Fatalities, Homicide, and Suicide (Canada, 1983–1985); Improvements on a

Monthly Index Including Motor Vehicle Fatalities, Homicide, Suicide, Cigarette Consumption, and Worker-Days Lost in Strikes (Canada, 1972–1986)

494 IMPACT ASSESSMENT ANALYSIS OF BEHAVIORAL QUALITY OF LIFE INDICES: EFFECTS OF GROUP PRACTICE OF THE TRANSCENDENTAL MEDITATION AND TM-SIDHI PROGRAM

Michael C. Dillbeck, Ph.D.; and Maxwell V. Rainforth, M.S., M.A.

Improved Quality of National Life: Improvements Controlling for Economic Changes on a Monthly Index Including Motor Vehicle Fatalities, Homicide, Suicide, Deaths Due to Accidents (other than Motor Vehicle), Notifiable Diseases, Alcohol Consumption, Cigarette Consumption (United States, 1970–1986); Improvements Controlling for Economic Changes on a Monthly Index Including Motor Vehicle Fatalities, Homicide, Suicide, Cigarette Consumption (Canada, 1972–1986)

495 MAHARISHI'S FORMULA FOR A PREVENTION WING IN THE MILITARY—APPLIED AND FOUND SUCCESSFUL IN MOZAMBIQUE: CASE STUDY, 1993–1994.

Lt. Gen. Tobias Dai

Case Study of Improved Quality of National Life as Measured by Decreased Crime, Decreased Auto Fatalities, Greater Economic Growth, and Increased Rainfall (Mozambique, 1993)

496 THE EFFECTS OF THE MAHARISHI TECHNOLOGY OF THE UNIFIED FIELD: REPLY TO A METHODOLOGICAL CRITIQUE

David W. Orme-Johnson, Ph.D.; Charles N. Alexander, Ph.D.; and John L. Davies, Ph.D.

Strong Replication of Original Research Methodology: Decreased International Conflict (Israel and Lebanon, August–September 1983)

497 THE DYNAMICS OF US-SOVIET RELATIONS, 1979–1986: EFFECTS OF REDUCING SOCIAL STRESS THROUGH THE TRANSCENDENTAL MEDITATION AND TM-SIDHI PROGRAM.

Paul Gelderloos, S.Sc.D.; Kenneth L. Cavanaugh, Ph.D.; and John L. Davies, Ph.D.

Improved USA–USSR Relations: Improved USA Statements and Actions Towards the USSR and Improved USSR Statements and Actions Towards the USA (USA and USSR, 1979–1986).

498 U.S.–SOVIET RELATIONS AND THE MAHARISHI EFFECT: A TIME SERIES ANALYSIS

Kenneth L. Cavanaugh, Ph.D.; and Paul Gelderloos, S.Sc.D.

Improved USSR–USA Relations: Improved USSR Statements and Actions Towards the USA, Controlling for Behaviour of USA, Seasonality, and Gorbachov Administration (USSR, 1979–1986).

PART IV: THEORETICAL AND REVIEW PAPERS

A: Physiology and Health

499 THE PHYSIOLOGY OF MEDITATION: A REVIEW. A WAKEFUL HYPOMETABOLIC INTEGRATED RESPONSE

Ron Jevning, Ph.D.; R. Keith Wallace, Ph.D.; and Mark Biedebach, Ph.D.

The authors propose that practice of the Transcendental Meditation Technique creates an integrated physiological response with peripheral circulatory and metabolic changes subserving increased central nervous activity, and review data from previous research on physiological changes associated with the Transcendental Meditation Programme.

500 THE PHYSIOLOGY OF HIGHER STATES OF CONSCIOUSNESS

Robert Keith Wallace, Ph.D.

The author reviews current research on the Transcendental Meditation Programme delineating physiological correlates of the development of higher states of consciousness.

501 SERUM HORMONAL CONCENTRATIONS FOLLOWING TRANSCENDENTAL MEDITATION—POTENTIAL ROLE OF GAMMA AMINOBUTYRIC ACID

Alan N. Elias, M.D.; and Archie F. Wilson, M.D., Ph.D.

The authors review research on the hormonal changes associated with the Transcendental Meditation Technique and attempt to understand these changes in light of the known effects of the neurotransmitter gamma aminobutyric acid (GABA) on hormonal secretion and release, proposing that one of the mechanisms by which the Transcendental Meditation Technique produces relaxation is by enhancing the effects of an endogenous neurotransmitter.

502 TRANSCENDENTAL MEDITATION AS A TECHNIQUE TO INCREASE NEURAL, COGNITIVE, AND BEHAVIORAL PLASTICITY

David W. Orme-Johnson, Ph.D.

The author reviews research indicating that regular practice of the Transcendental Meditation Technique increases the flexibility of the nervous system and improves general adaptive ability.

503 A NEUROENDOCRINE MECHANISM FOR THE REDUCTION OF DRUG USE AND ADDICTIONS BY TRANSCENDENTAL MEDITATION

Kenneth G. Walton, Ph.D.; and Debra Levitsky, M.S.

This paper outlines a model of the neurochemical and endocrine processes associated with chronic stress and their contribution to the development of drug addiction; it also reviews research on the physiological effects of Transcendental Meditation in light of this model, indicating mechanisms of how this technique creates physiological balance and thereby promotes freedom from addictive behaviours.

504 IN SEARCH OF AN OPTIMAL BEHAVIORAL TREATMENT FOR HYPERTENSION: A REVIEW AND FOCUS ON TRANSCENDENTAL MEDITATION

Robert H. Schneider, M.D.; Charles N. Alexander, Ph.D.; and Robert Keith Wallace, Ph.D.

This paper reviews the body of research papers on the benefits of the Transcendental Meditation Programme for reduction of hypertension, focussing in detail on two controlled clinical trials showing decreased hypertension among the elderly. The authors examine the Transcendental Meditation Technique in light of requirements for an optimal behavioural treatment of hypertension.

505 THE EFFECTS OF TRANSCENDENTAL MEDITATION COMPARED TO OTHER METHODS OF RELAXATION AND MEDITATION IN REDUCING RISK FACTORS, MORBIDITY, AND MORTALITY

Charles N. Alexander, Ph.D.; Pat Robinson, Ph.D., O.T.R.; David W. Orme-Johnson, Ph.D.; Robert H. Schneider, M.D.; and Kenneth G. Walton, Ph.D.

This paper reviews four meta-analyses that show the superiority of the Transcendental Meditation Programme compared to other techniques in producing deep rest, decreasing anxiety, increasing self-actualization, and decreasing substance abuse (cigarettes, drugs, alcohol). It also reviews individual well-controlled studies on the beneficial effects of this technique on hypertension, mortality, medical care, and medical expenses, and discusses physiological mechanisms for these effects.

B: Education

506 THE IMPACT OF MAHARISHI'S VEDIC SCIENCE BASED EDUCATION IN HIGHER EDUCATION: THE EXAMPLE OF MAHARISHI INTERNATIONAL UNIVERSITY

Christopher H. Jones, Ed.D.

The author reviews research findings demonstrating holistic development among the students of Maharishi International University in the United States (now Maharishi University of Management), and examines the source of these effects in the unique system of Maharishi's Vedic Science Based Education offered by the University.

507 PREPARING THE STUDENT TO SUCCEED AT CALCULUS

M. Anne Dow, Ph.D.

The author describes how current reforms in teaching of calculus address the object of knowledge and the process of knowing, but leave the development of the student's full mental capacity, the knower, largely to chance. The practice of the Transcendental Meditation Programme develops the knower and thereby gives at least two distinct advantages: a relaxed, alert mind and an intuitive experiential framework for feeling at home with the limit process.

C: Psychology

508 HIGHER STATES OF CONSCIOUSNESS: MAHARISHI MAHESH YOGI'S VEDIC PSYCHOLOGY OF HUMAN DEVELOPMENT

Michael C. Dillbeck, Ph.D.; and Charles N. Alexander, Ph.D.

The authors outline the development of higher states of consciousness from Maharishi's Vedic Psychology in light of relevant research, and propose that human development to these higher states beyond the experience of waking, dreaming and sleeping results from experience of pure consciousness, the Self.

509 ADVANCED HUMAN DEVELOPMENT IN THE VEDIC PSYCHOLOGY OF MAHARISHI MAHESH YOGI: THEORY AND RESEARCH

Charles N. Alexander, Ph.D.; Dennis P. Heaton, Ed.D.; and Howard M. Chandler, Ph.D.

The authors describe the development of higher states of consciousness as brought to light by Maharishi Mahesh Yogi in his Vedic Psychology, and contrast this to contemporary themes of cognitive or self development. The authors then review research demonstrating uniquely high scores on self-development among advanced participants in Maharishi's Transcendental Meditation and TM-Sidhi Programme

510 MAHARISHI'S VEDIC PSYCHOLOGY: ALLEVIATE SUFFERING BY ENLIVENING BLISS—RECONNECT THE PARTIAL VALUES OF LIFE WITH THE WHOLENESS OF LIFE

Paul Gelderloos, S.Sc.D.

This paper examines how Maharishi's Vedic Psychology fulfils the practical goals of psychology and reviews scientific research indicating that Maharishi's Transcendental Meditation and TM-Sidhi Programme improves the physical and mental health of the individual and creates an influence of harmony in society.

511 THE BHAGAVAD-GITA: A CASE STUDY IN MAHARISHI'S VEDIC PSYCHOLOGY

Michael C. Dillbeck, Ph.D.

The paper considers the *Bhagavad-Gita* as a model case study from the Vedic Literature, providing knowledge of the full range of human development to higher states of consciousness; this knowledge of development of consciousness is systematically brought to light in Maharishi's Vedic Psychology and supported by research on the Transcendental Meditation and TM-Sidhi Programme.

512 THE CONCEPT OF SELF IN THE BHAGAVAD-GITA AND IN THE VEDIC PSYCHOLOGY OF MAHARISHI MAHESH YOGI: A FURTHER NOTE ON TESTABILITY

Michael C. Dillbeck, Ph.D.

This paper points out that the subjective experience of Transcendental Consciousness ('Self') described in the *Bhagavad-Gita* has effects that have been measured through extensive scientific research on Maharishi's Transcendental Meditation Programme.

513 TRANSCENDENTAL MEDITATION

Charles N. Alexander, Ph.D.

This paper presents an introduction to the Transcendental Meditation Programme and major scientific research findings on its effects for the individual and society.

D: Rehabilitation

514 EFFECTIVENESS OF THE TRANSCENDENTAL MEDITATION PROGRAM IN PREVENTING AND TREATING SUBSTANCE MISUSE: A REVIEW

Paul Gelderloos, S.Sc.D.; Kenneth G. Walton, Ph.D.; David W. Orme-Johnson, Ph.D.; and Charles N. Alexander, Ph.D.

The authors review research studies demonstrating decreased substance abuse among the general population, among participants in treatment programmes, and among prison inmates through practice of the Transcendental Meditation Programme.

515 THE TRANSCENDENTAL MEDITATION PROGRAM FOR PREVENTION OF ALCOHOL AND DRUG ABUSE AMONG JUVENILES AT RISK

Michael C. Dillbeck, Ph.D.

The author reviews research indicating that the Transcendental Meditation Programme reduces risk factors for substance abuse and increases factors that protect against abuse; the paper also reviews research demonstrating effective reduction of alcohol and drug use through this programme.

516 TRANSCENDENTAL MEDITATION AS AN EPIDEMIOLOGICAL APPROACH TO DRUG AND ALCOHOL ABUSE: THEORY, RESEARCH, AND FINANCIAL IMPACT EVALUATION

David W. Orme-Johnson, Ph.D.

This paper focuses on the contributions of the Transcendental Meditation Programme to resolving the broad social problems associated with addictions. The author proposes that drug and alcohol abuse are symptoms of a general stress-addiction-crime epidemic in society. The paper then reviews sociological research findings showing how societal disorder—experienced as crime, drug abuse, political conflict, and economic instability—can be substantially and cost-effectively reduced through the group practice of the Transcendental Meditation and TM-Sidhi Programme.

517 THE THEORETICAL FOUNDATIONS AND PRACTICAL VALIDATION OF MAHARISHI'S INTEGRATED SYSTEM OF REHABILITATION

Michael S. King, B.Juris., LL.B.(Hons.)

This paper outlines the theoretical foundations of Maharishi's Integrated System of Rehabilitation. It shows how this system of rehabilitation is validated by extensive scientific research and by personal experience of offenders instructed in the Transcendental Meditation Programme. The author concludes that this system of rehabilitation offers a solution to key problems within the field of rehabilitation, including recidivism, the method of rehabilitation, and measurement of rehabilitation.

E. Business

518 THE INTELLIGENCE MODEL OF ORGANIZATIONAL EFFECTIVENESS: ITS IMPLICATIONS FOR ENHANCED PRODUCTIVITY

Robert E. Herron, M.B.A.; and William W. Graff, M.A., M.B.A.

The authors review research on the importance of intelligence in job performance, and on the effect of the Transcendental Meditation Programme in increasing intelligence, in improving job performance and related variables in the business setting, and in improving the quality of the collective consciousness of the whole society.

519 TRANSFORMING HUMAN RESOURCES FOR THE TWENTY-FIRST CENTURY

Jane Schmidt-Wilk, M.B.A.; and Dennis P. Heaton, Ed.D.

The authors review research indicating that the Transcendental Meditation Programme simultaneously promotes creativity, health, and teamwork—three human resource qualities that are vital for success in the future business environment.

520 DEVELOPING CONSCIOUSNESS IN ORGANIZATIONS: THE TRANSCENDENTAL MEDITATION PROGRAM IN BUSINESS.

Jane Schmidt-Wilk, M.B.A.; Charles N. Alexander, Ph.D.; and Gerald C. Swanson, Ph.D.

A review of research and case studies on the application of Maharishi's Transcendental Meditation Programme in the workplace indicates improved employee health, increased job satisfaction, improved job performance and productivity, and improved organizational performance and climate. These results are discussed in terms of the development of consciousness of the individual and the organization.

F. Quality of Life

521 IMPROVING THE NATIONAL ECONOMY THROUGH ALLIANCE WITH NATURE'S GOVERNMENT: EFFECTS OF THE GROUP PRACTICE OF MAHARISHI'S TRANSCENDENTAL MEDITATION AND TM-SIDHI PROGRAM

Kenneth L. Cavanaugh, Ph.D.; Kurleigh D. King, Ph.D.; and Birney D. Titus, Ph.D.

This paper reviews a series of studies that document improvements in the national economies of the U.S. and Canada, as indicated by an index of decreased inflation and decreased unemployment, when the number of participants in Maharishi's Transcendental Meditation and TM-Sidhi Programme exceeded the square root of one percent of their national populations.

522 PEACEFUL BODY, PEACEFUL MIND, PEACEFUL WORLD

Charles N. Alexander, Ph.D.

This paper reviews scientific research studies demonstrating the development of peace within the individual through Maharishi's Transcendental Meditation and TM-Sidhi Programme, and explains how this development forms the basis of creating peace in the world.

523 THEORY AND RESEARCH ON CONFLICT RESOLUTION THROUGH THE MAHARISHI EFFECT

David W. Orme-Johnson, Ph.D.

This paper presents the *Maharishi Effect* as the practical basis for creating world peace, and describes scientific research demonstrating the effectiveness of the *Maharishi Effect* in generating coherence and peace on all levels of society.

524 ACHIEVING WORLD PEACE THROUGH A NEW SCIENCE AND TECHNOLOGY

John S. Hagelin, Ph.D.

This paper examines scientific evidence for a new technology of world peace based on the Unified Field of Natural Law, and considers its practical utilization through a field effect of consciousness generated by large groups of experts practising the Transcendental Meditation and TM-Sidhi Programme.