CHAPTER-2

REVIEW OF RELATED RESEARCHES

2.1 Introduction
2.2 Studies on Meditation
1. Physiological condition
2. Psychological responses
3. Behaviour
4. Positive traits
5. Negative traits
6. Learning
7. Miscellaneous
Conclusion of the studies
2.2.1 Physiological Conditions
2.2.2 Psychological responses
2.2.3 Behaviour
2.2.4 Positive traits
2.2.5 Negative traits
2.2.6 Learning
2.2.7 Miscellaneous
2.3 Detailed reports of some studies
2.3 A. Physiological condition
A. Homeostasis
2.3 B. Psychological responses
B.-1 Psychological health
B.-2 Psychological health
2.3 C. Behaviour
C.-1 Classroom behaviour
2.3 D. Positive traits
D.-1 Academic attainment
D.-2 Self-actulization
D.-3 Creativity
D.-4 Personal adjustment
2.3 E. Negative traits
   E.-1 Insomnia
   E.-2 Insomnia
   E.-3 Trait anxiety
   E.-4 State anxiety
   E.-5 Neuroticism
   E.-6 Mental health

2.3 F. Learning
   F.-1 Academic achievement
   F.-2 Creativity
   F.-3 Creative intelligence
   F.-4 Performance on learning
   F.-5 Paired associated learning

2.3 G Miscellaneous
   G.-1 Intelligence
   G.-2 Personality traits
   G.-3 Personality traits
   G.-4 Personality functions

2.4 Major Conclusions of the studies on meditation

2.4.1 Physiological condition
   (1) Physiological Responses
   (2) Internal Physiological Changes
   (3) Physiological Condition
   (4) Physiological
   (5) Physiological condition
   (6) Physiological condition
   (7) Hemispheres and Meditation
   (8) Physiological condition
   (9) Reflect time

2.4.2 Physiological Responses
   (1) Physiological Responses
   (2) Focusing

2.4.3 Behaviour
   (1) Neurotic Behaviour
   (2) Smoking Behaviour
   (3) Non-attending Behaviour
2.4.3 Behaviour
   (1) Neurotic Behaviour
   (2) Smoking Behaviour
   (3) Non-attending Behaviour
2.4.4 Positive traits
   (1) Peace, Co-operation, Understanding
   (2) Self perception and Expectation
   (3) positive personality Traits
   (4) Relaxation
   (5) E.S.P.
2.4.5 Negative traits
   (1) Anxiety
   (2) Anxiety
   (3) Chronic anxiety
   (4) Trait anxiety
   (5) Trait Anxiety
   (6) Stress
   (7) Tension, Social relations
   (8) Mental retardation
   (9) Pain distress and pain sensation
   (10) Neuroticism
2.4.6 Learning
   (1) Concentration ability
   (2) Memory
   (3) Cognitive effects
2.4.7 Miscellaneous
   (1) Suggestibility
   (2) Suggestibility
   (3) Alcoholics
   (4) 'Mindfulness
   (5) Rorschach responses
   (6) ESP rating
   (7) Hypnotic Susceptibility
   (8) Hypnotic responsivity
   (9) Perception
   (10) Actual selves
2.5 Summary
CHAPTER : 2
REVIEW OF RELATED RESEARCHES

2.1 INTRODUCTION :

Field of ‘Meditation is comparatively emerging field from research point of view. Though the phenomenon seem to be an ancient one. Scientific studies on it are not that old. Researchers tried to scan the literature and earlier studies. Voluminous literature is there in different languages; particularly in ‘Sanskrit’ in descriptive form. Investigator felt that it was necessary to go through only research work done in the field. Thereafter it was decided to find out the latest researches. These studies mainly cover the area or Meditation.

2.2 STUDIES ON MEDITATION:

Many researchers have tried to find out the impact of meditation on various variables. Table 2.1 gives a bird eye view about variables and researches.

It could be seen from table 2.1 that 65 studies are reported. Many variables have been examined. To facilitate the understanding these variables were classified in seven broad categories tentatively. These categories were as under:

(1) Physiological condition
(2) Psychological responses
(3) Behaviour
(4) Positive traits
(5) Negative traits
(6) Learning
(7) Miscellaneous

As it is apparent from the table most of the variables were affected positively by meditation, some variables did not yield positive impact of meditation. To get the clear idea of these studies, some of the researches are presented here. For the remaining studies only conclusions are reported.
TABLE : 2.1

BIRD’S EYEVIEW ABOUT THE RESEARCH IN THE AREA OF MEDITATION

1. Physiological condition :

<table>
<thead>
<tr>
<th>No. of Studies</th>
<th>Variable impact of Meditation on....</th>
<th>Study done at Country</th>
<th>Researchers</th>
<th>Impact, positive negative or uncertain</th>
<th>Survey Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Physiological condition</td>
<td>Dublin, Ireland</td>
<td>Dalmonte M.M.</td>
<td>Positive</td>
<td>Significant</td>
</tr>
<tr>
<td>2</td>
<td>Physiological condition</td>
<td>Wellington</td>
<td>Puente et.al.</td>
<td>Positive</td>
<td>Significant</td>
</tr>
<tr>
<td>3</td>
<td>Hemisphere &amp; Meditation</td>
<td>Canada</td>
<td>Earle Jonathan B.</td>
<td>Negative</td>
<td>Not Significant</td>
</tr>
<tr>
<td>4</td>
<td>Physiological condition</td>
<td>Los Angeles</td>
<td>Cradidio, Steven G.</td>
<td>Positive</td>
<td>Significant</td>
</tr>
<tr>
<td>5</td>
<td>Internal physiological changes</td>
<td>Canada</td>
<td>Farrow, et.al.</td>
<td>Positive</td>
<td>Significant</td>
</tr>
<tr>
<td>6</td>
<td>Physiological condition</td>
<td>London, England</td>
<td>Carruthars et.al.</td>
<td>Positive</td>
<td>Significant</td>
</tr>
<tr>
<td>7</td>
<td>Physiological condition</td>
<td>New Zealand</td>
<td>Throll D.A.</td>
<td>Positive</td>
<td>Significant</td>
</tr>
<tr>
<td>8</td>
<td>Reflex Time</td>
<td>Taxas</td>
<td>Warshal Webar</td>
<td>Positive</td>
<td>Significant</td>
</tr>
<tr>
<td>9</td>
<td>Homeostasis</td>
<td>Indiana</td>
<td>John M.et.al.</td>
<td>Positive</td>
<td>Significant</td>
</tr>
<tr>
<td>10</td>
<td>Physiological responses</td>
<td>Los Angeles</td>
<td>Becker et.al.</td>
<td>Positive</td>
<td>Significant</td>
</tr>
</tbody>
</table>
2. Physiological responses:

<table>
<thead>
<tr>
<th>No. of Studies</th>
<th>Variable impact of Meditation on....</th>
<th>Study done at Country</th>
<th>Researchers</th>
<th>Impact, positive negative or uncertain</th>
<th>Survey Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Physiological responses</td>
<td>Dublin, Ireland</td>
<td>Dalmonte M.M.</td>
<td>Positive</td>
<td>Significant</td>
</tr>
<tr>
<td>2</td>
<td>Physiological health</td>
<td>New York</td>
<td>Larry A. Hjelle</td>
<td>Positive</td>
<td>Significant</td>
</tr>
<tr>
<td>3</td>
<td>Focusing</td>
<td>Valley</td>
<td>Amedio John</td>
<td>Positive</td>
<td>Significant</td>
</tr>
<tr>
<td>4</td>
<td>Physiological health</td>
<td>California</td>
<td>Philips C.Ferguson et.al.</td>
<td>Positive</td>
<td>Significant</td>
</tr>
</tbody>
</table>

3. Behaviour:

<table>
<thead>
<tr>
<th>No. of Studies</th>
<th>Variable impact of Meditation on....</th>
<th>Study done at Country</th>
<th>Researchers</th>
<th>Impact, positive negative or uncertain</th>
<th>Survey Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Smoking behaviour</td>
<td>West Chester U.</td>
<td>Cohen Bernard B.</td>
<td>Positive</td>
<td>Significant</td>
</tr>
<tr>
<td>2</td>
<td>Neurotic behaviour</td>
<td>Dublin, Ireland</td>
<td>Dalmonte M.M.</td>
<td>Positive</td>
<td>Significant</td>
</tr>
<tr>
<td>3</td>
<td>Non attending behaviour</td>
<td>U. West Florida</td>
<td>Redfering David L.</td>
<td>Positive</td>
<td>Significant</td>
</tr>
<tr>
<td>4</td>
<td>Classroom behaviour</td>
<td>Canada</td>
<td>Haward Shecter</td>
<td>Positive</td>
<td>Significant</td>
</tr>
</tbody>
</table>
### 4. Positive traits:

<table>
<thead>
<tr>
<th>No. of Studies</th>
<th>Variable impact of Meditation on....</th>
<th>Study done at Country</th>
<th>Researchers</th>
<th>Impact, positive negative or uncertain</th>
<th>Survey Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Peace, co-operation and understanding</td>
<td>Santacruz</td>
<td>Nelson Alan</td>
<td>Positive</td>
<td>Significant</td>
</tr>
<tr>
<td>2</td>
<td>Positive personality trait</td>
<td>California</td>
<td>Walsh Roger</td>
<td>Positive</td>
<td>Significant</td>
</tr>
<tr>
<td>3</td>
<td>Relaxation</td>
<td>England</td>
<td>Michael A.</td>
<td>Positive</td>
<td>Significant</td>
</tr>
<tr>
<td>4</td>
<td>E.S.P.</td>
<td></td>
<td>Nash Garroll B.</td>
<td>Positive</td>
<td>Significant</td>
</tr>
<tr>
<td>5</td>
<td>Creativity</td>
<td>India</td>
<td>Sinh B. Santoshkumar</td>
<td>Positive</td>
<td>Significant</td>
</tr>
<tr>
<td>6</td>
<td>Academic Attainment</td>
<td>Honolulu</td>
<td>Roy W. Collier</td>
<td>Positive</td>
<td>Significant</td>
</tr>
<tr>
<td>7</td>
<td>Self-actualization</td>
<td>Ohio</td>
<td>William Seeman et.al.</td>
<td>Positive</td>
<td>Significant</td>
</tr>
<tr>
<td>8</td>
<td>Personal adjustment</td>
<td>Indiana</td>
<td>John M. et.al.</td>
<td>Positive</td>
<td>Significant</td>
</tr>
<tr>
<td>9</td>
<td>Self perception &amp; Expectation</td>
<td>Dublin Ireland</td>
<td>Dalmonte M.M.</td>
<td>Positive</td>
<td>Significant</td>
</tr>
</tbody>
</table>
5. Negative traits:

<table>
<thead>
<tr>
<th>No. of Studies</th>
<th>Variable impact of Meditation on...</th>
<th>Study done at Country</th>
<th>Researchers</th>
<th>Impact, positive negative or uncertain</th>
<th>Survey Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Stress</td>
<td>Canada</td>
<td>D. Frew</td>
<td>Positive</td>
<td>Significant</td>
</tr>
<tr>
<td>2</td>
<td>Trait Anxiety 3</td>
<td>S.W. Texas U.</td>
<td>Eliny Sheiles</td>
<td>Positive</td>
<td>Significant</td>
</tr>
<tr>
<td>3</td>
<td>Cronic Anxiety</td>
<td>New York</td>
<td>Raskin Marjoree et.al.</td>
<td>Positive</td>
<td>Significant</td>
</tr>
<tr>
<td>4</td>
<td>Anxiety Autonomic responses</td>
<td>Denison U.</td>
<td>Linted Albert G.</td>
<td>Negative</td>
<td>Not Significant</td>
</tr>
<tr>
<td>5</td>
<td>Neuroticism</td>
<td>Canada</td>
<td>O’ Haire et.al.</td>
<td>Positive</td>
<td>Significant</td>
</tr>
<tr>
<td>6</td>
<td>Mental Retardation</td>
<td>Southern California</td>
<td>Eyerman James</td>
<td>Positive</td>
<td>Significant</td>
</tr>
<tr>
<td>7</td>
<td>Pain distress and Pain sensation</td>
<td>California</td>
<td>Milts et.al.</td>
<td>Positive</td>
<td>Significant</td>
</tr>
<tr>
<td>8</td>
<td>Tension Social relation</td>
<td>Kansels city</td>
<td>Hewilt et.al.</td>
<td>Positive</td>
<td>Significant</td>
</tr>
<tr>
<td>9</td>
<td>Trait Anxiety</td>
<td>Wellington New Zealand</td>
<td>Throll D.A.</td>
<td>Positive</td>
<td>Significant</td>
</tr>
<tr>
<td>10</td>
<td>Insomnia 1</td>
<td>Canada</td>
<td>Donald E.Miskiman</td>
<td>Positive</td>
<td>Significant</td>
</tr>
<tr>
<td>11</td>
<td>Insomnia 2</td>
<td>Canada</td>
<td>Donald E.Miskiman</td>
<td>Positive</td>
<td>Significant</td>
</tr>
<tr>
<td>12</td>
<td>Neuroticism</td>
<td>Netherland</td>
<td>Andre Tjoa</td>
<td>Positive</td>
<td>Significant</td>
</tr>
<tr>
<td>13</td>
<td>Trait Anxiety 4</td>
<td>Ohio</td>
<td>Maureen Stern</td>
<td>Positive</td>
<td>Significant</td>
</tr>
<tr>
<td>14</td>
<td>State Anxiety 5</td>
<td>Ohio</td>
<td>Sonford Nidich et.al.</td>
<td>Positive</td>
<td>Significant</td>
</tr>
<tr>
<td>15</td>
<td>Anxiety Mental health</td>
<td>Ranchi India</td>
<td>J.N.Vyas et.al.</td>
<td>Positive</td>
<td>Significant</td>
</tr>
<tr>
<td>16</td>
<td>Anxiety</td>
<td>Ireland</td>
<td>Wallmonte M.M.</td>
<td>Positive</td>
<td>Significant</td>
</tr>
</tbody>
</table>
6. Learning:

<table>
<thead>
<tr>
<th>No. of Studies</th>
<th>Variable impact of Meditation on...</th>
<th>Study done at Country</th>
<th>Researchers</th>
<th>Impact, positive negative or uncertain</th>
<th>Survey Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Cognitive effects</td>
<td>Canada</td>
<td>Julle et.al.</td>
<td>Positive</td>
<td>Significant</td>
</tr>
<tr>
<td>2</td>
<td>Memory</td>
<td>Washington</td>
<td>Frumkin et.al.</td>
<td>Positive</td>
<td>Significant</td>
</tr>
<tr>
<td>3</td>
<td>Concentration ability</td>
<td>West Germany</td>
<td>Sabel Bernard</td>
<td>Negative</td>
<td>Not Significant</td>
</tr>
<tr>
<td>4</td>
<td>Paired associated learning</td>
<td>Berkely, California</td>
<td>Allan I.Abrams</td>
<td>Positive</td>
<td>Significant</td>
</tr>
<tr>
<td>5</td>
<td>Performance in learning task</td>
<td>Canada</td>
<td>Donald E.Miskiman</td>
<td>Positive</td>
<td>Significant</td>
</tr>
<tr>
<td>6</td>
<td>Creative Intelligence</td>
<td>America</td>
<td>Robert Korry</td>
<td>Positive</td>
<td>Significant</td>
</tr>
<tr>
<td>7</td>
<td>Creativity</td>
<td>California</td>
<td>Michael J. McCallum</td>
<td>Positive</td>
<td>Significant</td>
</tr>
<tr>
<td>8</td>
<td>Academic Achievement</td>
<td>Fairfield Iowa</td>
<td>Wennis P. et.al.</td>
<td>Positive</td>
<td>Significant</td>
</tr>
</tbody>
</table>
7. Miscellaneous:

<table>
<thead>
<tr>
<th>No. of Studies</th>
<th>Variable impact of Meditation on....</th>
<th>Study done at Country</th>
<th>Researchers</th>
<th>Impact, positive negative or uncertain</th>
<th>Survey Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Suggestibility</td>
<td>Czechoslovakia</td>
<td>Wostack</td>
<td>Positive</td>
<td>Significant</td>
</tr>
<tr>
<td>2</td>
<td>Perception</td>
<td>Ohio</td>
<td>Holeman et.al.</td>
<td>Positive</td>
<td>Significant</td>
</tr>
<tr>
<td>3</td>
<td>Mindfulness</td>
<td>Barre M.A.</td>
<td>Karnifield Jack</td>
<td>Positive</td>
<td>Significant</td>
</tr>
<tr>
<td>4</td>
<td>Hypnotic responsivity</td>
<td>Canada</td>
<td>Spanos et.al.</td>
<td>Positive</td>
<td>Significant</td>
</tr>
<tr>
<td>5</td>
<td>E.S.P.rating</td>
<td>Cennedy U.</td>
<td>Palmer et.al.</td>
<td>Positive</td>
<td>Significant</td>
</tr>
<tr>
<td>6</td>
<td>Hypnotic susceptibility</td>
<td>Canada</td>
<td>Spanos et.al.</td>
<td>Positive</td>
<td>Significant</td>
</tr>
<tr>
<td>7</td>
<td>Rorschach responses</td>
<td>Cambridge</td>
<td>Brown et.al.</td>
<td>Positive</td>
<td>Significant</td>
</tr>
<tr>
<td>8</td>
<td>Suggestibility</td>
<td>Dublin Ireland</td>
<td>Dalmonte M.M.</td>
<td>Positive</td>
<td>Significant</td>
</tr>
<tr>
<td>9</td>
<td>Personality traits</td>
<td>West Germany</td>
<td>Theo Fehr et.al.</td>
<td>Positive</td>
<td>Significant</td>
</tr>
<tr>
<td>10</td>
<td>Intelligence</td>
<td>Netherland</td>
<td>Andre Tjoa</td>
<td>Positive</td>
<td>Significant</td>
</tr>
<tr>
<td>11</td>
<td>Personality functions</td>
<td>Bhopal, India</td>
<td>Uday Jain</td>
<td>Positive</td>
<td>Significant</td>
</tr>
<tr>
<td>12</td>
<td>Personality traits</td>
<td>Delhi India</td>
<td>Sofia Ahmed et.al.</td>
<td>Positive</td>
<td>Significant</td>
</tr>
<tr>
<td>13</td>
<td>Alcoholics</td>
<td>Wellington</td>
<td>Kline, et.al.</td>
<td>Positive</td>
<td>Significant</td>
</tr>
<tr>
<td>14</td>
<td>Actual selves</td>
<td>America</td>
<td>Turnbul et.al.</td>
<td>Positive</td>
<td>Significant</td>
</tr>
</tbody>
</table>
2.2.1 **Physiological Conditions**:

10 students are included in this category. 70% of these studies are on physiological conditions. Except Hemispher and Meditation in all most the studies the impact of meditation on physiological condition is found to be positive. That means meditation works as a good treatment for physiological condition. Other traits like Reflex time and Homeostasis were also found to be affected significantly by meditation on positive side. This means any person practicing meditation can get benefits. Hence meditation can safely be used for the process of development. Many physiological activities could be enhanced by meditation.

2.2.2 **Physiological responses**:

Out of four studies included in this category, most of the studies are on psychological health. Impact of meditation on psychological health is found to be positive. That means meditation works as a good medicin for people having problems of mental-health. In this section other studies were also found to be affected significantly by meditation on positive side. These means any person practicing meditation can get benefits in finding solutions for the problems in the area of mental-health.

2.2.3 **Behaviour**:

Out of four studies included in this section the first two could be considered as negative behaviours. Generally smoking behaviour is not socially positive one, though accepted. The other two studies are related to learning activities. In all situations meditation has brought a positive impact on there behaviours. This
means one can use meditation to get rid of negative habits like smoking. It is also found that meditation facilitates learning.

2.2.4 Positive traits:

In this category ‘9’ studies are included. Two studies are related to learning activity. Impact of meditation on positive traits is found to be positive. All studies were found to be affected significantly by meditation on positive side. It is also found that meditation facilitates learning. Thus learning process can be accelerated by inducing practice of meditation. Moreover, processes like ESP, creativity and Relaxation can also be accelerated by practice of meditation.

2.2.5 Negative traits:

In this category 16 studies are included. 50% of these studies are on ‘Anxiety’. Except Autonomic responses in almost all the studies the impact of meditation on Anxiety is found to be positive. That means meditation works as a good medicine for Anxiety. Other negative traits like Stress, Neuroticism, Mental retardation, Insomnia, tension and pain distress were also found to be affected significantly by meditation on positive side. This means any person practicing meditation can get benefits in such conditions. This also means that meditation seems to have a therapeutic value for negative traits. Hence meditation can safely be used as a treatment device for many psychological ailments.

2.2.6 Learning

In this category 8 studies are included. All studies are on learning. Except concentration ability in almost all the studies the impact of meditation on learning is found to be positive. That
means meditation works as a good helper for learning. Other traits like creative Intelligence, Creativity, Memory and Cognitive affects were also found to be affected significantly by meditation on positive side. That means any person practicing meditation can get benefits. It is also found that meditation facilitates learning.

2.2.7 Miscellaneous:

As in case of other variables meditation brought positive impact on varied of processes. Only in case of Alcoholics it was not found useful. Alcoholics did not show any positive result. One more striking study in this section is about ‘Rorschach responses’. As a matter of fact few studies are found in this area. Particularly in this study the results were positive and encouraging.

2.3 DETAILED REPORTS OF SOME STUDIES

2.3.A Physiological Condition:

A.1: John M. et.al. have tried to study the impact of meditation on Homeostasis.

Ten male college students were selected as subjects. Five who had been practicing TM regularly for at least one year composed the experimental group. The other five served as non-meditating controls. However, it was discovered after beginning the study that two control subjects had been practicing a mental technique of mind control during the experiment, and thus they were excluded from the analysis. The remaining control group of bona fide non meditators had a baseline temperature higher than that of the TM group. Consequently, the TM subject having the lowest baseline temperature was excluded from the analysis even though there was no statistically significant difference between the
groups on baseline temperature. This was done avoid any “law of initial values,” effect that could have remained.

A bio feedback temperature trainer (model TB 1, Scott Behavioural Electronics) was used for continuous monitoring of temperature changes. A thermistor was taped to the middle finger of the dominant hand. A base line temperature was determined when the needle stabilized to less than $0.1^\circ F$ derivation for one minute. The experimenter then instructed the subject to close his eyes, for ten minutes and at nine minutes told him that he would be asked to open his eyes in one minute. It was assumed that the TM meditators would spontaneously meditate during the eyes-closed and all reported that they did. After ten minutes of sitting with eyes closed, subjects sat for five minutes with eyes open, than ran in place for five minutes (thereby producing a temperature drop in the hand), and finally sat down again for five minutes. The experimenter recorded subjects’ temperature deviation from the baseline to within $0.05^\circ F$ every 60 seconds throughout the experiment (25 minutes).

For each subject a score was computed equally to the mean temperature of the final two readings for each phase of the experiment. For the eyes-closed phase, the temperatures at eight and nine minutes, because when the meditators were told that they should open their eyes in one more minute, they stopped meditating. The eyes-open value was the mean of readings at 14 and 15 minutes; the running-in-place value was the mean of readings at 19 and 20 minutes; and the recovery value was the mean of readings at 24 and 25 minutes.
Changes in hand temperature in the meditators while practicing the TM technique did not differ from changes occurring in controls who merely closing the eyes. Also, the changes in temperature were not in the same direction in every TM subject. Subjects in the TM group returned to their pre-running temperature more quickly than did the subjects in the non-meditating group. This finding is consistent with the view that the Transcendental Meditation technique enhances one’s ability to cope with a changing environment both physically and emotionally. This study does not distinguish between the effect of meditation immediately preceding the temperature disruption and the long-term effect of meditation over a period of months.

A second interpretation, which cannot be ruled out by this study, is that the self-selecting process, whereby some people who practice TM continue to meditate regularly, may yield a group of people whose autonomic homeostasis differs from that of irregular meditators and non-meditators. Also, the degree to which expectation may have affected these results cannot be fully ascertained. Nevertheless, this preliminary finding of increased temperature homeostasis in people who practice the Transcendental Meditation technique is sufficiently encouraging to warrant further research.

2.3.B Psychological responses:

B.1 Larry A. Hjelle has tried to study the impact of meditation on psychological health.

SUBJECT - Two groups of subjects were tested. In the first group (regular meditators) were seven males and eight females who had
been meditating an average of 23.63 mo. at the time the personality scales were administered. The second group (beginning meditators) included 11 males and ten females who completed the personality scales 1 week prior to receiving the usual instructions for meditation. All subjects were recruited from the local chapters of the students International Meditation Society affiliated with the University of Rochester and State University College at Brockport.

Both group were administered test package that included three personality measures.

Bending’s (1) modified version of the Taylor manifest Anxiety Scale has 20 items presented in a true-false format with high scores reflecting participation in some emotional or socially unacceptable experience or act, e.g., “I work under a great deal of tension.” “I am inclined to take things hard.”

Rotter’s Internal/External Locus of Control Scale (5) is a measure of the extent to which people believe that they possess some control over their lives. High scores on this 23 - items forced choice scale are associated with an external orientation, that is, belief that one’s reinforcements are controlled by fate, luck, or powerful others.

Shostrom’s (7) personal orientation Inventory was designed as a comprehensive measure of values and behaviour construed to be of importance in the development of self actualization. It consists of 150 two-choice, paired-open value statements that are scored in terms of two major scales, Time competence and Inner-directed and ten secondary subscales.
Subjects, were tested in small groups or individually, with only the examiner present. They were informed that the research was part of a general assessment of the personality profiles of people who had practiced Transcendental Meditation for some time or people who were about to engage in the practice of Transcendental Meditation. They were encouraged to respond as honestly and openly as they could and were told that their own specific answers would be treated confidentially.

These results substantially support the hypothesis that a group of individuals having practiced Transcendental Meditation are markedly higher on measures regarded as indicative of psychological health than a comparable group of individuals about to begin meditating. These results are consistent with the findings reported by Seeman, Widich, and Banta (6) and, furthermore, are not susceptible to the methodological criticism that such findings suggest a conscious desire on the part of meditators to show changes in personality as a result of meditating. However, it could be argued that regular meditators attempted to “Fake good” responses on the measures of self-actualization. The plausibility of the interpretation seems unlikely since Foulds and Warehime (2) demonstrated that subjects instructed deliberately to distort their responses in order to present themselves in the “most favourable light possible” scored significantly lower on ten of the 12 shostrom Scales. Hence, these results do not seem attributable to the differential tendency of regular Transcendental Meditation subjects to make a good impression on the shostrom Inventory. Rotter (5) has also controlled for social desirability in developing his
measures of locus of control, and yet regular meditators were significantly more internal than novice meditators. This finding is especially worth noting since accumulating research has shown significant relationships between internality and personality measures of adjustment (e.g., 3, 8). Finally, the significant difference on the anxiety measure lends supports to the experimental claim of many meditators that Transcendental Meditation produces decreased physical and mental tension.

The group differences obtained in this study suggest several important applications of meditation. Perhaps most salient are the clinical - counseling applications of Transcendental Meditation for students experiencing vocational, social, or personal problems. Insofar as Transcendental Meditation is an easily learned, non-time consuming activity, therapists might profitably teach the technique to clients manifesting well-defined behavioural systems, e.g., depression, suicidal thoughts, academic deficiencies and sexual difficulties. An added benefit of the therapeutic application of Transcendental Meditation is that its effects are presumed to come about rapidly and do not depend on new beliefs or altered styles of living. Another potential application of Transcendental Meditation that is of particular contemporary importance is its relevance to combatting drug abuse among young people. In a survey of 1,862 college students who had practised Transcendental Meditation, Wallace and Benson (10) found a sizeable decline in the number who reported using marihuana, amphetamines, barbiturates, and LSW; for example, while 48% reported using LSD before meditation. 97% declared themselves to
be nonusers since starting meditation. Of course, subjects might have spontaneously changed their drug habits independently of having meditated. Further, research is clearly required in order to determine whether this recommended use of Transcendental Meditation is justifiable or not. Nevertheless, the present data are very promising and should encourage personologists to take a closer empirical look at the phenomenon of Transcendental Meditation.

B.2 Philips C. Ferguson, et.al. have tried to study the impact of meditation on psychological health:

Subjects were three groups of volunteer University students a control group of 19 non-meditators enrolled in a graduate level education class (nine males, ten females; mean age = 24.7 years) an experimental group of 33 short-term meditators, who began TM at the beginning of the experimental period (19 males, 14 females; mean age = 23.6 years) and a second experimental group of 16 long-term meditators match for age, sex and education level with the other two groups (seven males, nine females; mean age = 24.8 years). These students had been practising TM regularly for a mean of 43.1 months. The following battery of tests was used.

The Northridge Developmental Scales (NDS) - This new personality test of 90 items was developed by Gowan for use in screening the emotional maturity and psychological soundless of candidates for a master’s degree in guidance and counselling. It contains a major scale, much like the SAV (Self-actualizing Value) scale of shostrom’s Personal Orientation Inventory, two validating scales and three sub-scales for aggression, depression, and
neuroticism. A copy of this test, a description of its scoring methodology (for authorized test personnel), and copies of reliability and validation studies are available from Gowan.

The Cattell Anxiety Scale (IPAT) - This well-known anxiety scale is purported to measure “free anxiety level.”

The Spidberge State-Trait Anxiety Inventory (STAI) only the trait scales, which purports to measure nontransitory anxiety,” was used. The correlation between the Cattell scale and the Spielberger Trait scale has been reported to be + 75 and + 76 in two studies with college students (11, p. 10).

The pretest battery was administered to the control group of nonmeditators during a class meeting and to the experimental group of short-term meditators three days prior to their learning the TM technique. Following the standard format instruction in TM was given by qualified teachers and included individual instruction on the initial day followed by future instruction in a group situation on each of the next three days. Each meeting lasted about an hour.

After six and one-half weeks, during which experimental subjects meditated for 15-20 minutes twice daily and control subjects attended regular class meetings in an encounter group classroom environment, the battery was again administered to both groups under conditions similar to those of the pretest.

The second experimental group (long-term meditators) was given the battery of tests once. This group had been practicing TM a mean of 43.1 months. Testing conditions were similar to those of the other two groups.
These results appear to indicate that Transcendental Meditation program is effective in reducing negative personality traits and increasing self-actualization after only six weeks, and that this effects is cumulative. One alternative interpretation of these findings might be that the meditators higher scores are due to a desire to give positive responses (to take good”) based on their expectation of benefits from TM. However, the Northridge Developmental Scale has two strong validating scales built into the test, and all subjects scored within the norms for these scales on both pretest and post-test. It is also reasonable to assume that the long-term meditators would attempt to “fake good” to approximately the same extent as short-term meditators, yet their scores are markedly different. Therefore the results cannot be accounted for by biased responses based on expectation of benefits from TM. Rather, the effects of TM appear to be pronounced and cumulative.

Another alternative interpretation of the results is that the short-term TM subjects, being self selected, were initially different in relevant ways from the control group. However, a study by Stek and Bass (12) indicated that university students interested in taking up the practice of TM do not differ significantly on a measure of personal adjustment (Shostrom’s Personal orientation Inventory) and a measure of perceived locus of control (Rotter’s Internal/External locus of control) from persons uninterested in TM or from an uninterested group with a mixture of interest levels. Their result is supported by our finding of insignificant pretest
differences between groups on all but one scale. Therefore, initial
differences between groups probably do not account for the results.

These preliminary findings indicate that the regular
practice of the TM technique, for even as short period as six weeks,
reduces anxiety, depression, and neuroticism and increase self
actualization in an interested volunteer group of university students.
The data further suggest that those practicing TM for a shorter
period. Also the long-term meditators show a more developed state
of psychological health than the general population.

Thus, the Transcendental Meditation programme
appears to bring positive psychological benefits. It may provide the
necessary condition - perhaps the “proper condition” that Carl
Rogers refers to in the opening quotation - to catalytically impel
and promote the natural evolutionary and creative tendency in
human life to develop, expand and extend itself.

2.3.C : Behaviour :

C.1 Haward Shecter, has tried to study the impact of meditation on
classroom behaviour :

Students in the science of creative Intelligence courses
at each of the three participating high school (Bulkeley, Penny, and
wafkinson) were matched against control groups according to age,
sex and grade point average. The control students were selected
from another elective class with an orientation toward personal
development (i.e. psychology) measurements on all variables were
taken during the first two weeks of the school semester (before the
SCI students were taught the Transcendental Meditation technique)
and again during the last two weeks of that semester. All the SCI
students learned the Transcendental Meditation technique, within the first three weeks of the semester. In addition, measurements of some variables on Record in students files were recorded for three semester prior to the SCI course. These records were taken to serve as a basis for a long term comparison of students’ performance before and after they completed the SCI course. However, in this preliminary report only grades for the grading period immediately preceding the SCI course were used and were compared with grades for the two grading periods during the course.

Grade point average (G.P.A.) and records of absence tardiness, and major disciplinary offenses were obtained from students transcripts. Classroom behaviour was measured by teachers who completed an observed behaviour scale, the Hahneman High School Behaviour rating scale. This scale gives the teachers’ estimate of the degree to which the student shows five behavioural traits positively correlated with good academic performance and eight behavioural traits negatively correlated with good academic performance. Finally immediate and general anxiety were measured by asking the students to complete the state. Trait Anxiety Inventory a simple measure of immediate (state) and general (trait) anxiety levels.

This initial data have both major strengths and weaknesses. The strengths and two-fold, first positive changes of similar magnitude were noted among the students in the SCI courses at all three schools. This fact suggests that the results can be replicated. Second, the changes were statistically significant at two of three schools, despite the very small number of students
involved in the study. The failure of the students enrolled in the Bulkeley SCI course to show a statistically significant improvement in grade point average is probably due to the unusually high grade point averages of the students before they enrolled in the class. For example, improvement of the group grade point average from A - to A is much more difficult to achieve than improvement in a group average from C to B. The nearly statistically significant reduction in Anxiety levels of the Watkinson students would probably become significant if the same changes were noted in a slightly larger sample size.

The major weakness of this study was the inadequate matching of control and SCI students. Because some SCI students had to drop the course after testing was already underway, the original matching of control and SCI groups became skewed. This problem is being avoided in the second semester of the project. The control and SCI groups are closely matched, and an additional control group composed of students enrolled in the SCI course for the third semester of the project is being tested. This additional control group will strengthen the present data considerably. Also, additional data are being collected on the original SCI group’s academic performance during the two semester following their completion of the science of creative Intelligence Course.

It is interesting to note that the SCI students showed a higher anxiety level than the control group at the outset of the project and a far lower anxiety level after one semester of SCI. The reduction in anxiety level may account for initial improvements in grades and behaviour.
The science of creative Intelligence and its practical application, the Transcendental Meditation program appear to bring about improved academic performance and to reduce anxiety levels. They may also helpful in improving students’ classroom behaviour.

2.3.D Positive Traits:

D.1 Roy W. Collier, has tried to study the impact of meditation on, Academic Attainment:

The academic records of seven students practicing Transcendental Meditation at the University of Hawaii were examined retrospectively to determine the effect of meditation on their academic performance. These subjects were selected on the basis of their uninterrupted attendance at the university for at least two semesters before and one semester after the practice. Academic attainment was measured by grade point average (GPA). Four Points were assigned for a grade of A in a course, three points for a B, two for a C, one for a D, and zero for a failing grade. Grades for a student’s first semester were not included, as they are not typical of later semesters for most students at this university. Subjects’ GPA’s for two or more semesters before they began Transcendental Meditation were compared with their GPA’s for one or more semesters after they began the practice.

The considerable body of research on the Transcendental Meditation program indicates that superior performance associated with the practice of the Transcendental Meditation technique is, in part, a function of some of the following qualities developed as a result of the practice: integrated behaviour
more productive activity (3); increased flexibility in adapting to a novel situation (6); increased perceptual ability (7); faster reactions (9); increased energy and efficiency (8); reduced tension (lower anxiety) (5); and decreased inhibition (1). The significant improvement in grade point average found in this small study supports the idea that superior academic performance and achievement are spontaneous consequences of the improvement in psychology and psychology brought about by the practice of Transcendental Meditation.

It now seems clear that significant improvements can be made in the educational process without changing the classroom environment, teaching materials, or teaching techniques, but rather by enlivening the internal environment of the student. For example, most educators agree that anxiety is a major impediment to learning; the well studied reduction in anxiety that occurs in people who practice the Transcendental Meditation technique (2, 4, 5) undoubtedly contributes to the increased motivator and academic preliminary results indicate that the full potential of this technique for developing the student's capacity to learn should be thoroughly explored in future research.

**D.2** William Seeman et.al. have tried to study the impact of meditation on, self-actualization:

**SUBJECTS** - Two groups of subjects participated in this study The control (non-meditation) group consisted of ten males and ten females and the experimental (meditation) group of eight males and seven females. All of the subjects were University of Cincinnati undergraduate students.
MATERIALS AND PROCEDURE - The POI was administered twice to both groups. The first administration occurred two days before the beginning of Transcendental Meditation and the second administration two months later.

The meditation group received the usual 30-60 minutes individual instruction on the initial meditation day. For three successive days, verification and further instruction in the technique were given in a group situation. They were then instructed to meditate twice daily (15-20 minutes) for the first two-year course.

The practice of Transcendental Meditation for a two month period has a salutary influence on a subject’s psychological state as measured by the POI. Inner directedness appeared augmented. To use shostrom’s imagery, the meditation permitted the experimental subjects to rely more confidently on their “psychic gyroscopes.” It would be interesting to see whether such meditation comparably influences the Locus of control scale (11), which is designed to measure internal versus external control. In the light of Maslow’s (10) comment that “self-actualizing people are altruistic.” It might also be of interest to obtain pre-and post-Transcendental Meditation measures of altruism. Even more intriguing would be some pre-and post- Transcendental Meditation. Q-sort measures by subjects of congruence (or self-liking). Intuitively one would expect the correlation between perceived and ideal self to be high following meditation (12).
The Transcendental Meditation group scored significantly higher than the control in the ability to express feelings in spontaneous action. Maslow (10) states that:

Self-actualizing people can all be described as relatively spontaneous in behaviour and far more spontaneous than that in their life, thoughts, impulses, etc. (p.157).

Although spontaneity is a difficult variable to assess behaviourally, blind clinical judges might globally rate control and experimental subjects for spontaneity. Experimental subjects also scored higher on POI. Acceptance of Aggression and capacity for Intimate contact. Aggression within one’s self may be more acceptable following this experience, and relations with others may be more meaningful as suggested by Shostrom (12). It should be feasible to test experimentally whether Transcendental Meditation increases tolerance for verbal aggression, by using experimental designs in which confederates direct aggressive commands to their “partners.” Capacity for intimate contact might be tied to an increasing experimental literature on self-disclosure (4). That is, does Transcendental Meditation influence one’s willingness to disclose accepts of the self to others? Appropriately selective adjectives from standard checklists used on self-ratings and clinical judges ratings may reveal the influence of Transcendental Meditation on states of relaxation or contentment. The possible influence of Transcendental Meditation on the self-concept could be studied by using Q-sort or appropriate self-concept test instrument (e.g. Tennessee self-concept Scale (3)).
D.3: Sinh B. and Santoshkumar have tried to study the impact of meditation on Creativity:

**Subjects:**

The subjects were VI grade male students within the age range of 11 to 13 years. They were selected on the basis of preliminary testing with the Jalota (1964) Group test of general Mental Ability (GMAT) in Hindi language. The GMAT was initially administered to 270 students. On the basis of their GMAT scores, two matched groups, one experimental and the other control, were formulated. Each group consisted of 60 students. The groups were also matched on age and parental income level.

**Materials:**

The Meholi Verbal Test of Creativity Thinking (VTCT) was used as the measure of creativity. The test includes four subjects (consequences, unusual uses, similarities, product improvements), and yields their scores; Fluency, the number of responses; Flexibility, the number of different categories of responses used; and originality the response frequency compared with normative samples.

**Procedure:**

Before the subjects were assigned to the experimental and control group, the VTCT was administered to them, in accordance with the instructions given in the manual, for determining the baseline or pre-test data.

Thereafter completion of this pre-treatment test period, the experimental subjects were instructed by a qualified teacher of TM who followed a standardised method that involved introductory
and preparatory lectures, personal interview of each subject, and instructions to individual subjects for two days and supervised practice of TM technique for 20 minutes daily for subsequent 5 days. In addition to having sessions in the school with the teacher, the experimental subjects were also instructed to practice TM once a day in the evening for 20 minutes at home. The parents were also requested to see that all the boys practised TM regularly in the evening at their respective residences. The TM practice both in the morning as well as in the evening was continued for another 85 days. The morning practice on all working days was done in the school and the evening practice at home; on holidays both morning and evening practice was done by individual students at their respective residences.

Ideally, the practice of TM requires the subject to do it without having eaten anything before it could be practised only at the time of the school assembly in the morning. And, moreover, except giving clear instructions to experimental subjects that they should bring their packed breakfast with them and take it after they had finished the meditation practice, no other strict control was feasible.

With a view to collecting the post-treatment data the VTCT was administered on the experimental subjects two times during the TM practice period (after 15 days of practice and then after another 15 days of practice) and once at the expiry of the TM practice (after 90 days of practice). The control group simply administered the VTCT along with the experimental group at the same time interval.
The creativity protocols of the subjects were scored in accordance with the procedure given in the test manual. Each item was scored separately for fluency, flexibility and originality. The composite score was derived by adding the raw scores for three components (Singh, 1982).

The data were treated by the analysis of variance, As the TM x Testing Sessions interaction was statistically significant for all the criterion measures, i.e., creativity scores, the significance of differences between means was evaluated by the Hewman Keuls test.

For the fluency scores the control group had higher baseline scores than the TM group (P.01), the differences got somewhat narrowed down but remained statistically significant when testing was done 15 days after practice (P.01). The differences between the two groups, however disappeared when tested after 30 days practice, and the TM groups excelled the control group when testing was done 90 days after practice (P.01).

The control group had higher baseline flexibility scores (P.01) than the TM group, the differences disappeared when the groups were tested 15 days after practice. The TM group had higher scores than the control group when tested after 30 (P.01) and 90 days (P.01) practice.

For the originality scores there were no differences between the TM and the control groups for the baselines scores, the differences continued to remain non-significant when the groups were tested after 15 days of practice. But the TM group had significantly higher originality scores then the control group when
testing was done after 30 (P.01) and 90 days (P.01) of practice. Similarly, for the composite creativity scores the control group had superior baseline performance (P.01) than the TM group, the differences got narrowed down when tested after 5 day’s practice but remained statistically significant (P.05). The TM group outscores the control group when tested after 30 (P.01) and 90 day’s (P.01) practice.

The results thus consistently demonstrate that the TM practice enhances the creative potential as measured by the verbal Tests of creative. Thinking. The results of the present study lend support to the findings of MacCallum (1975) and shear (1982) who also found that TM practice improves performance on tests of creativity.

D.4 Robert J. Stek, et.al. have tried to study the impact of meditation on Personal Adjustment:

Subjects:

Subjects, students at Indiana State University, ranged in age from 17 to 24 yrs. Group I were 17 self-selected students who attended two free introductory lectures on meditation and paid an initiation fee to the society for enrolment in a four-day course. There were 12 males and five females; their median age was 20 yrs. Group II were 34 self-selected students who attended at least one of the two free introductory lectures. There were 14 males and 20 females; their median age was 18 yrs. Group III were 27 students from introductory Psychology courses who participated in the study for partial fulfilment of their course requirement. They stated that they were aware that a course in meditation was being offered on
campus but that they were not interested in attending any of the lectures. There were 12 males and 15 females; their median age was 19 yrs. Group IV were 30 students from introductory psychology courses who participated for fulfilment of their course requirement. This was an unselected control group who provided base rate. There were 18 males and 12 females; their median age was 19 yrs.

PROCEDURE:

Rotter’s (6) Internal/External control of Reinforcement scale was used as the measure of perceived locus of control; shostrom’s (7, 8) POI, the measure of personal adjustment, is scored along two independent dimensions of time competence (23 items) and Internal Support (127 items), the best over-all measures of self-actualization (1, 2, 8). Both tests were administered under standard instruction in one session.

The means and standard deviations for the four groups are presented in table 1. These are similar to but not significantly different from those previously reported for college students on two scale (6, 8). Analyses of variance indicated on significant differences among groups on any of the scales. The distributions of scores on the measures were examined for any bimodal tendencies since motivations toward meditation training other than those hypothesized may have existed. For example, the less well-adjusted person might turn to a technique such as meditation with the hope that it might solve his personal problems, or he might use it to escape his problems temporarily. However, no clear bimodal tendencies were observed on any of the three measures.
The data suggest that persons interested in meditation did not differ significantly on these scales from persons Uninterested in meditation or from an unselected norm group with a mixture of interest levels. Therefore it seems unwarranted to assume that among college students, persons interested in meditation are either more self-actualized or more neurotic than the average person. Even those who stated that they were definitely uninterested in meditation differed little from persons interested enough to pay a fee to learn the technique of Transcendental Meditation. Interest in meditation may be a curiosity about an activity that attracts persons who are not significantly different on measures of locus of control and personal adjustment from persons interested in other pursuits.

However, other personality dimensions may correlate with levels of interest in meditation. Capacity for regression in service of the ego and tolerance for unrealistic experience both predicted response to a type of Zen Buddhist meditation (3, 5). Further investigation is needed to clarify these and related aspects of meditation.

2.3.E Negative traits :

E.1: Donald E. Miskiman has tried to study the impact of meditation on Insomnia:

The subjects were five male and five female adults, all of whom were referred to the experimenter by physicians, who diagnosed them as suffering from chronic Insomnia. Each subject was interviewed by the experimenter. At this time the experimental nature of the project was emphasized, and the subjects were asked
to be as objective as possible throughout the project. The experimenter also obtained brief biographical information and/or detailed account of the history and from of each subject’s insomnia.

The subjects were given a set of 30 identical forms on which to record the time they went to bed each evening and the estimated time it took them to fall asleep (to be recorded on the following morning). At the end of this 30-day period, the subjects were individually taught the Transcendental Meditation technique by a qualified instructor. Following the usual procedure the correctness of the practice was verified each day for three days and then at intervals of ten days throughout the study.

On the day subjects began Transcendental Meditation, they were given an additional set of 30 forms on which to record the time it took them to fall asleep (in the same manner before). At 60 and 90 days after learning the technique, the subject again recorded, for a ten-day period each time, how long it took them to fall asleep.

The results as show clear and dramatic. The pretest - post-test comparison indicates that the subjects estimated it took them a significantly shorter time to fall asleep after learning the Transcendental Meditation technique. Not only did TM initially alliviate insomnia, but the follow-up data demonstrate that the effects of the technique were stable over time (i.e., there was no incident of relapse).

It may be argued that the self-reporting method is vulnerable to both intentional and unintentional bias. However,
argument applies more to global reports of improvement then to the specific daily long used in this similar studies (1,3,5).

Future studies will be necessary to determine the factors responsible for the success of the Transcendental Meditation program as a therapeutic treatment for insomnia. Since this program has been demonstrated to reduce anxiety, fatigue, nervousness, and stress, the cause of its therapeutic efficiency appears to be an all-encompassing restoration of physiology and psychology, rather than merely a single specific effect.

The result reported this study are encouraging for a variety of reasons. First, the TM program was dramatically successful in treating insomnia. In addition, Transcendental Meditation itself has many favourable characteristics. It is taught in a standardized manner by qualified instructors and is easy to learn; it takes little time both to learn and practice, and it does not induce any unfavourable side effects. TM could therefore be universally and easily applied on a non-drug treatment for insomnia under most circumstances.

E.2 : Donald E. Miskiman has tried to study impact of meditation on, Insomnia.

The search for an efficient, effective and simple method of relieving insomnia has led to a variety of treatment suggestions. However, there are few longitudinal studies investigating these suggestions. This study is a follow-up of the author’s previous investigation (1) reporting the rapid and successful treatment of insomnia by means of the Transcendental Meditation program.
All subjects in previous study were recontacted and asked to record for ten day periods the time they took to fall asleep, beginning at 120, 150, 180, 210, 240, 270, 300, 330, and 360 days after learning the Transcendental Meditation technique. The method of self-report was identical to that used in the earlier study.

The mean time before onset of sleep during this one year-follow-up period is summarized in table. The significance of these results was examined by the method of orthogonal contrasts. There was no significant difference at the 0.01 level among these follow-up periods and the two initial follow-up periods reported earlier. Therefore, these results clearly demonstrate that the Transcendental Meditation program is a successful treatment for insomnia throughout the first year of its implementation, and that the effect of the program is stable over time.

Patients experienced no difficulty in learning the TM technique, and it produced no unfavourable side effect over the one-year period. Therefore, The Transcendental Meditation Program should be experimentally implemented as a treatment for a variety of sleep complaints and investigated for its therapeutic application in other areas of clinical work.

E. 3: Maureen Stern has tried to study the impact of Meditation on Trait Anxiety.

The Trait Anxiety Scale of the state Trait Anxiety Inventory developed by Spielberger, Gorsuch, and Lushene (5) was used to measure the level of anxiety subjects generally felt. This scale was administered to 37 high school and college students who had been practising Transcendental Meditation from six months to
six years. These subjects volunteered from a group of people attending an advanced lecture on TM. Three days later a second group of 15 students attending a second introductory lecture on the Transcendental Meditation Program, but who had not yet learned to practice the technique, volunteered to complete the Trait Anxiety Scale after the lecture.

Since the non-meditating control group used in this study consisted of students who were sufficiently interested in the TM program to attend two lectures on it and who, in most cases, were about to learn the technique. It seems likely that the control group was roughly comparable to the TM group apart from the effects of the technique itself. It is true that long-term studies of changes in anxiety should be conducted in which an attempt is made to control for volunteer effect, placebo effects, and experimental demand; however, the numerous studies already made on the effects of TM on anxiety and related variables suggest that anxiety increasingly declines the longer a person practices TM. The present study confirms the findings that Transcendental Meditation reduces anxiety, particularly the amount of anxiety generally felt by an individual. Therefore the practice of the TM technique should improve health and performance in a variety of situations, both mental and physical.

E.4 : Sanford Hidich, et.al. have tried to study the impact of meditation on State Anxiety :

Two groups of subjects, all under-graduates at the University of Cincinnati, completed the STAI A-state questionnaire under control conditions and again six weeks later experimental
conditions. An experimental group of eight subjects (meditators) completed the questionnaire for the first time two days prior to introduction in the Transcendental Meditation technique. The control group of nine subjects (non meditators) completed the questionnaire under similar conditions at the same time, but did not receive instruction in TM. Control subjects were students enrolled in a credit course on the science of creative Intelligence at the University of Cincinnati. The course covered the intellectual understanding of Transcendental Meditation, but the actual practice of the TM technique was optional. The members of the control group had chosen not to start the practice. The experimental condition consisted of a demanding task - that of taking the Remote Associates Test (3) under a restricted time limit. Comments made by subjects in both groups indicated that the Remote Associates Test was demanding and made them feel anxious. Directly after taking the test the control group was instructed to sit with eyes closed for 15 minutes, and the meditation group was instructed to meditated for 15 minutes. The anxiety scale was then re-administered to both groups.

It is well known that mental talks such as math problems produce elevated blood pressure responses in normal and hypertensive subjects (1) such studies are indicative of the fact that the “recruiting response” and/or the “Fight-or-Flight” anxiety response (2) can be elicited by circumstances that are not physical threatening. Research in recent years has indicated that the “stress response” can be elicited by and life situation; person with chronic anxiety react to everyday life situations as if they were
emergencies. This form of pathological anxiety resulting from long-term exposure to stressful conditions exemplifies the fact that the degree of stress produced by a particular situation depends not only upon the nature of the external event, but also the internal state of the individual. It is becoming more and more evident to behavioural psychologists that the internal state of the organism must be taken into account to explain differences in behavioural responses.

The Transcendental Meditation technique, by introducing physiologically quiescent state, appears to lower anxiety levels and reduced the effect associated with potentially stressful situations, as measured by the STAI A-state scale, allowing the individual to retain emotional equilibrium in the midst of demanding situations.

Many researchers feel that anxiety is caused by a lack of certainty. The identity crisis in adolescents is related to the uncertainty of what the future will bring. People practicing TM report that uncertainty about the future decrease and that the present takes on more meaning and importance (5). Also, it has been shown that meditators feel more self confident, have a higher self regard, and feel more autonomous (4). All of these improvements in psychological traits are related to reduction in anxiety.

Historically, in attempts to improve the quality of life, society has placed emphasis upon the improvement of external factors. In the management of the problem of stress in society, however, it is increasingly apparent that the internal condition of the individual in society is an equally if not more important aspect of the problem. The Transcendental Meditation technique, by
adjusting the internal physiological response mechanisms, allows the person to be less perturbed by external demands and thus more effective in responding to potentially stressful environmental influences. Lowering of anxiety through TM may lead to increased energy, self sufficiency and flexibility in dealing with an increasingly complex environment.

Further psychological and physiological research is recommended to investigate the effects of the TM program on hypertensives in executive positions and military battle situations. Also research is indicated in the field of alcoholism, drug abuse, and mental health.

E. 5: Andre Tjoa has tried to study the impact of meditation on Neuroticism:

Neuroticism was measured by means of the Neurotische Labiliteit Geweten Vofens devoagenlijst methode, as directed by G. wilde in a manual with a dutch adaptation (by Fokkema and Dirkzwager) of the well known Differential Aptitude Tests developed in the USA. For the purpose of this study only the Figural Reasoning subtest (Figurenreeksen) was used. This subtests is a nonverbal analytical and logical reasoning test analogous to other nonverbal tests used to measure fluide intelligence. The Dutch version is published by Swets and Zelfeinger, Amsterdam. The raw scores for the neuroticism test were converted to percentile norms for males and females. The intelligence scores were converted to standard scores (Stanine Scale) for males and females.

The 20 subjects were all high school students in the same class, with ages ranging from 16 to 18. All subjects were
given both the neuroticism and intelligence tests before 14 of them learned Transcendental Meditation. The six control subjects were not taught Transcendental Meditation. Exactly one year later all subjects were given both tests again. Every four months throughout the year interval between tests, the meditating subjects indicated on a questionnaire what percentage of the time they had meditated twice a day, one a day or not at all. These percentage were multiplied by one, one half and zero respectively, and then added together. A regular meditator was defined as one with a mean weighted score of SD per cent or greater for one year interval. Other meditators are referred to as irregular meditators.

Students who regularly practiced no Transcendental Meditation technique showed a greater increase in intelligence and a greater decrease in neuroticism than non meditating controls. Neither of two possible attentive explanations of these results, self selection or placebo effects, is satisfactory. The meditators were obviously self-selected, as they chose to start the practice. However, any possible difference between prospective meditators and nonmeditating controls that might have been due to self-selection probably do not account for the results. Since the extent of change between the regular and irregular meditators was so markedly different. Like the controls, the irregular meditators did not decrease in neuroticism. The increased somewhat more in intelligence than the controls but much less than the regular meditators. Both groups of meditators chose to learn Transcendental Meditation, yet only those who practiced the technique on a regular benis experienced the full benefits of TM.
One cannot argue that suggestion or a placebo effect were responsible for these results. Neuroticism scores are probably not susceptible to suggestions, and intelligence scores almost certainly are not. Also, placebo effects are generally of short duration and thus could not account for changes over a one-year period. Therefore, this study indicates that the regular practice of the TM technique brought about a significant decrease in neuroticism over the period of one year. Such changes generally do not occur without psychiatric intervention of some kind. As seen in this study the neuroticism of irregular meditators and non-meditators did not change significantly.

The regular practice of TM apparently enables an individual to naturally develop a more stable and integrated self concept. Thus, his psychological health spontaneously improves without his having to attend to the details of psychological problems.

Also, the regular practice of the TM technique appears to increase fluid intelligence at a time when growth in intelligence usually reaches a plateau and thereafter begins to decline. The level of fluid intelligence attained during adolescence generally determines the maximum ability of the individual to adapt effectively to new situations and to perceive complex relationship. Therefore, increasing fluid intelligence during late adolescence obviously will improve an individual’s effectiveness in whatever he undertakes throughout his adult life.

These striking but preliminary results are now being tested in a more extensive longitudinal study.
E.6: J.H. Vyas et.al. have tried to study the impact of meditation on Mental Health

30 persons seeking for the Transcendental Meditation Programme were interviewed by the first author. Subjects below 20 years and above 45 years were excluded and those having an educational qualification of Middle school and above were selected. They were evaluated at the pre TM. Programme and were re-evaluated after 6 weeks of initiation at Maharshi Institute of Creative Intelligence, Jaipur.

Hamilton Anxiety rating scale (Hamilton, 1959):

Scale pad electrodes were used and a bipolar central recording was made on 8 channels. Subjects were instructed to rest quietly in supine position with the eyes closed throughout the experimental period. They meditated during the period on the post TM evaluation.

In this study the participants themselves have served as their control group. The t-value was obtained by the “Difference Formula.”

In the present study it is evident that the participants did show a statistically significant improvement in the memory. Improved memory function in normal individual can be well due to better psychological health.

The finding in study is in accordance with another study (Ahrams, 1972). He concluded that experienced meditators acquired pair associates faster than both non-meditators and beginning meditators and recalled a higher number of paired
associates over the intervals. Further, the evidence of improved memory comes from the study of Miskiman (1973). He found that meditators reached the criterion level of performance in mean of 10.1 trials, whereas the non-meditators required significantly more trials a mean of 22.0 ($P < 0.01$); (t-test). The meditators also had fewer errors for trials. In another study he has shown an enhanced ability to organise thought into conceptual categories through the Transcendental Meditation programme. He found that (a) secondary organization increased more in the meditators than in controls, (b) on post Testing meditators demonstrated less clustering variability (c) meditators performed significantly better than controls on a arithmatic filler task. These results indicate that the Transcendental Meditation Programme enhances the organizational ability of the mind, a quality important to memory and abstract thinking. On this basis the present findings are self explanatory.

In the present study the participants were also subjected to Max Hamilton Anxiety Rating Scale and the scores were significantly reduced. A similar result was also obtained by Nidich et.al. (1973). There as both the groups were exposed to knowledge about the Transcendental Meditation programme, but only the experimental group was instructed in the technique, the reduced anxiety in the meditators was due to the experience of Transcendental Meditation rather than the knowledge about it. Therefore, the Transcendental Meditation technique effectively reduces the anxiety resulting from a demanding and potentially anxiety provoking situations of modern life.
Moreover, on the Spielberger’s state Trait Anxiety Scale, Meditators were found to be significantly less anxious than the non-meditators (t-test, P < 0.001) (Stern, 1974)

Thus it can be concluded that the Transcendental Meditation Programme is helpful in attaining a better mental health in the normal individuals. The improvement is evident in the initial few weeks of the TM programme with a longer period of the practice the cumulative effects can be seen.

2.3.F Learning:

F.1: Dennis P. Heaton, et.al. have tried to study the impact of meditation on Academic Achievement

The subjects were all meditators and teachers of TM attending a graduate program of inter-disciplinary studies at the Santa Barbara, California, Campus of Maharshi International University, Data were obtained from the transcripts of their undergraduate work at various other colleges and universities of 110 students in the graduate program, 25 had completed at least three terms as full time college students before learning TM and had also completed at least three additional terms of full time undergraduate study after learning TM. Of the 25 who comprised this short-term TM group, 11 had completed at least six undergraduate terms after beginning TM. These 11 subjects comprised the long-term TM group.

Of 29 students who had completed their bachelor’s degree before learning TM, four were eliminated because of insufficient data in their transcripts, and the remaining 25 became the control group. The mean age of both the short-term TM and
control group was 20. The short-term group included six females and 19 males, and the control group included nine females and 16 males.

A school term was considered to be the period for which a school normally gave grades - in some cases semesters, in other cases quarters. The criterion for fulltime study was at least half the normal class load for that school. Mean GPA was calculated by dividing the total quality points for each group of three terms by the total course credits the student carried during those terms. Quality points are assigned as follows: four points for a grade of A, three points for a B, two points for a C, and one point for a D, and zero for a failing grade.

For the short term TM group, each subject’s mean GPA for the three consecutive terms immediately before he learned the TM technique was compared to his mean GPA for the three terms immediately after he began TM. For the long-term TM group, the mean GPA of the fourth, fifth and sixth consecutive terms after the practice was begun was also computed. In order to determine a data collection period for controls comparable to that of meditators, control subject were individually matched with meditators with reference to the number of terms remaining before completion of the bachelor’s degree at the beginning of the experimental period.

GPA was found to increase markedly and significantly for meditators following instruction in the TM technique, but was found to increase only slightly for control subjects during a corresponding period. The slight upward trend in GPA’s for
controls is consistent with trends observed throughout the University of California (13). The data on long-term meditators suggest that the effects of TM are cumulative, a finding that is consistent with reports concerning the immediate and long-term effects of the TM program on drug use (3) and personality growth (8). Because 4.0 is the maximum possible grade point average, it becomes increasingly difficult for the student to improve his GPA as he approaches 4.0. This factor could account for the fact that the increase in mean GPA for the long-term meditators during the first three terms after learning the TM technique (0.83) was greater than during the next three terms (0.27), when their mean GPA was only half a point below the ceiling.

It might be argued that the increase in GPA’s after experimental subjects began TM could be related to a tendency toward improvement inherent in those who begin TM. Since in this study both control and experimental subjects eventually began TM, this argument is not valid.

The results of this study support the tents of the science of creative Intelligence that the single tactic of giving deep rest to the nervous system through TM improves practical performance in general. It is worth noting that TM is not taught specifically as a means of improving grades. It appear that the TM programme may facilited students achievement in a more simple and more comprehensive way than approaches that involve analyzing and attending to isolated components of behaviour.

The results of this study, if verified in future research, indicate that this simple and reliable procedure can enable students
to improve their academic performance and thereby enable educational institutions to move fully achieve their goals. More extensive investigations of the practical value of the Transcendental Meditation program should be carried out with students at all levels of education. The effects of the TM program on the grades of secondary, middle, and elementary school children, as well as its influence on measures of intelligence and specific aptitudes, should be studied. The use of the TM technique to treat such special problems as hyperactivity and emotional disturbances might profitably be researched. Since there is evidence that the TM technique produces increased general intelligence (15) and more accurate perceptual-motor performance (4), it may be found useful in the amelioration of learning disabilities and reading problems as well.

F.2: Michael J. McCallum has tried to study the impact of meditation on Creativity:

Subjects: The subjects were chosen by the cluster sampling method (9) in which two similar, intact groups were compared. The experimental group consisted of 47 long-term meditators (Mean 1.5 yrs.) attending a weekend advanced course of the TM program in Santa Barbara, California. Of the 47, two declined to participate and one turned in an incomplete test booklet, thus reducing the experimental group to 44 subjects (21 males and 23 females).

The control group also began with 47 subjects, but four declined to participate and two turned in incomplete tests, reducing the number to 41 (22 males and 19 females). Four groups of eight, nine, 12, and 18 control subjects, respectively, learned the
TM technique on four different Saturdays and were tested the day after they were instructed.

The two groups were equivalent in the demographic dimensions polled (age, sex, education, and income level).

Materials: The Tarrance Test of Creative Thinking, Verbal Form A, available from personnel press, Inc., Princeton, New Jersey, was used as the measure of creativity. The TTCT has seven sections, called “activities”, and yields three scores: Fluency, the number of responses; Flexibility, the number of different categories of responses used; and Originality, the response frequency compared with a normative sample.

A demographic questionnaire was used to elicit the information appearing and to provide the link between test and personal data, as subjects were asked to record their TTCT test booklet identification number on the questionnaire.

Procedure: Each test booklet was marked with an identification number from one to 120; the tests were then shuffled before they were distributed so that the numbers would not be in order.

Testing sessions were arranged by the experimenter, but to guard against bias another person, who was unconnected with the study and who was not informed of the exact nature of the hypothesis under investigation, was asked to administer the tests.

The experimental subjects (long-term meditators) were tested first, all in a single session. They were approached for the first time at a Saturday afternoon meeting during their week-end course and were told the following in an informal way:
(1) Much of the research that has been done on TM so far has been physiological, rather than psychological, in nature.

(2) We are interested in determining how styles of thinking change due to the practice of TM.

(3) This research is being done through California State College at Long Beach.

(4) Your participation is voluntary.

(5) However, this group has been chosen as a representatives sample, and as such it is important that it remains intact. Therefore, please participate if at all possible.

Then testing began:

The control subjects were first contracted on a Thursday evening at an introductory lecture on the TM program. All those interested in learning TM were asked to participate in the study. The same five points mentioned to the experimental group were covered. In addition, the control group was told that the study was in no way connected with their instruction in Transcendental Meditation.

The control subjects received their instruction in TM on a Saturday, and the testing session took place in Sunday afternoon, just prior to a regularly scheduled follow-up meeting on TM. Because there were no enough people learning TM on any one Saturday to fulfil the needs of the study, the control subjects were tested in four groups of eight, nine, 12 and 18 subjects, respectively, on four different Sundays.

The examiner kept all materials in his possession until testing was complete and then turned them over to the experiment
for evaluation. The demographic questionnaire were set aside, unexamined, and the tests were scored blind with only the random numbers as identification.

Scoring the TTCT was fairly difficult, and responses that did not readily conform to the examples provided in the scoring guide were common. For this reason a variation was introduced in the scoring procedure. Rather than scoring each test completely before going on to the next the experimenter scored a given activity across all subjects before going on to the next activity. Each activity was scored twice. The first time all readily scorable responses were scored, and all that were not readily scorable were copied onto a sheet of paper. With all of the hard to score responses recorded in one place, groups of similar responses could be identified, and thus scoring became easier and more uniform.

To check the objectivity of the scoring procedure, a random sample of ten tests was given to an elementary school teacher, who was unconnected with the study, for comparison scoring. The interscorer reliability coefficients, calculated from the real scores were found to be the following:

<table>
<thead>
<tr>
<th></th>
<th>r</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fluency</td>
<td>.97</td>
</tr>
<tr>
<td>Flexibility</td>
<td>.89</td>
</tr>
<tr>
<td>Originality</td>
<td>.92</td>
</tr>
</tbody>
</table>

When the scoring was complete, the demographic questionnaires were examined, and the tests were divided according to experimental and control groups. Following the T-score conversion contained in the Norms - Technical Manual (12), all real scores
were converted to T-scores, which were then used for statistical analysis except where otherwise noted.

As hypothesized, long-term meditators scored higher than similar new meditators on all three scales of the TTCT. The results show that with the number of responses held constant, long-term and new meditators did not differ in originality or flexibility. This is not surprising, given the high intercorrelations among the three TTCT scales, which suggest that these scales are not actually measuring different aspects of the creative process. In general, long-term meditators appeared to be able to produce a greater number of original responses over a wider range of topics than new meditators.

The lack of correlation between length of experience with TM and creativity within the group of long-term meditator, deserves some comment, several explanations are possible.

1. Increased creativity and experience with TM have been shown to be positively related, but in the present study some unknown factor perhaps some selection artifact among weekend course participants-reduced the correlations without appreciably affecting the differences in TTCT scores found between the experimental and control groups.

2. Perhaps the relationship between TM and creativity as measured by the TTCT follow a discontinuous function, and a discrete jump in creativity scores occurs shortly after the practice is began with no subsequent increase. This jump may be produced as the body rhythms adjust to the two new periods of rest per day.
(3) It is quite possible that the TTCT is sensitive to initial changes that occur shortly after beginning Transcendental Meditation, but is incapable of measuring more subtle but equally significant changes that subsequently occur.

(4) Dissonance theory (2) predicts that those subjects highly committed to the TM program would experience dissonance if the results of the study were to be unfavourable to TM and would therefore be more highly motivated than a group of uncommitted meditation. However, motivational differences due to the dissonance effect probably do not account for the results; short-term meditators, noticing immediate change in their lives, are often as enthusiastic about TM as long-term meditators, and therefore would presumably be as highly motivated to produced test result favourable to TM. Unfortunately, the present study did not control for the possibility of differences in motivation between the long term and the short-term meditators. In future studies the dissonance effect should be avoided by an improved experimental design.

(5) Another explanation is in terms of the wide range of creative abilities among subjects at the time they began the Transcendental Meditation technique. For example, for the group of subjects in this study who had just begun the Transcendental Meditation technique, creativity scores on the Fluency Scale ranged from 3.4 to 123.4 (the mean ± 2 standard deviations).

In a study of a cross section of TM meditators who has been practicing the technique for different amounts of time, differences in the initial level of creativity would obscure the effects of length of time practicing the technique. One three year
TM meditator may have started at a much higher level of creativity than another three-year TM meditator. Therefore, one would not expect to find fixed levels of creativity associated with specific lengths of time practicing the technique.

However, the fact that the group of subjects practicing the Transcendental Meditation technique as a whole increase in creativity compared to a group of new TM meditators suggests that the technique increases creativity in all individuals, irrespective of their initial creative abilities.

Research has shown that the TM program affects a wide range of physiological, psychological and sociological variables. It was postulated in the study that these broad effects occur because Transcendental Meditation leads to self-actualization. and creativity are positively related. TM and creativity would also be positively related. The results of the present study indicates the existence of a relationship between TM and creativity and therefore provide further support for the postulation that the Transcendental Meditation program does lead to self-actualization.

TM has been shown to be of great general benefit to the individual. The present study describes a preliminary examination of one of these benefits. The differences in creativity found between the two groups demand exploration in greater detail in well-controlled, longitudinal studies employing different measures of creativity.
F.3 : Robert Kory has tried to study the impact of meditation on Creativity Intelligence:

Science of creative Intelligence (SCI) courses, consisting of instruction in both the TM technique and the theoretical understanding on the technique, were used as the experimental treatment. In order to control for the relative effects each variable played in promoting changes, three treatment groups were established as follows:

Group 1 learned only the TM technique;

Group 2 participated in a complete SCI course. Thus learning both TM and the theory associated with it; and

Group 3 participated only in the theoretical discussions of the SCI course and did not learn TM. A fourth group, a control group, was instructed in neither TM nor the theoretical explanations of TM, which subjects comprised each of the four groups was to have been determined by randomly assigning subjects to one of the four groups. This procedure was modified to meet a situation, discussed below, that unexpectedly arose.

Four secondary schools under the board of education for the Borough of North York (near Toronto) agreed to sponsor the study and to allow qualified teachers of TM to advertise the TM program and meet with interested students. These students were informed of the nature of the study and the random assignment of subjects into one of the four groups. Approximately 100 students in the first three schools visited showed interest in participating in the study. However, a significant number stated they would participate only if they could take both or one of the sections of the TM
program. That is, they preferred not to participate with the possibility of being assigned to the control group.

At this point in the recruitment period, an unplanned one-month interruption of the study occurred. Upon its resumption, a total of 60 students in the four schools were still able to serve as subjects, but again a significant number refused the possible random assignment to Group 4. Most of the other students who could no longer participate in the study stated as their reason that during the one month delay they had changed their schedules and had committed the time required for the study to other programs and to jobs.

It was decided at that time to revise the experimental design by forming Group 4, composed of students matched to the first three groups by grade and sex. These control subjects, who had evidenced no prior interest in the study were recruited from several classes in the same schools. The original 60 volunteer students were then randomly assigned to Group 1, 2 and 3 and the additional 20 volunteer students served as control subjects in Group 4.

Prior to the random assignment of the 60 subjects to one of the three experimental groups, all 80 subjects were measured on several psychological variables. These served as the criteria for possible changes due to the practice of TM and/or exposure to the theory associated with TM. The particular variables selected, suggested by anecdotal accounts of long-term meditation and the literature on earlier TM studies, were as follows: creativity as measured by the Match problem test (a pencil and paper test fashioned according to Guilford’s criterion of figural
transformations requiring divergent thinking); intellectual performance, as measured by an untimed administration of the Raven Progressive Matrices, Set II (a pencil and paper test designed to measure the “9” factor of intelligence) anxiety, as measured by the Attitudes towards specific situations test (a Likert scaled Questionnaire designed to elicit specific responses to specific situations); and the personality variables complexity, conformity, energy level, innovation, self esteem, and tolerance, as measured by the Jackson Personality Inventory (a true-false questionnaire).

For the purposes of this study, and in accordance with the tests used, the personality variables have been defined in the following manner:

1. Creativity: The behaviour of transforming figural content in more than one way to satisfy a specific problem requirement.
2. Intellectual Performance: The general capacity for perceiving figural relationships and the ability to utilize this perception to solve a specific problem.
3. Complexity: The comfort in working with more abstract and complex, as opposed to more concrete and simple, situations.
4. Conformity: The tendency to act according to positions perceived to be held by others.
5. Energy level: The degree to which one has the ability to consistently perform multiple tasks without feeling fatigued.
6. Innovation: The preference for relying on one’s own ability to originate ideas and actions.
7. Self-Esteem: The degree of perceived comfort and acceptance of one’s self.
(8) Tolerance: The ability to enjoy ideas and behaviour not held by oneself.

(9) Anxiety: The specific responses the individual experiences as a result of facing specific situations that may threaten him.

Upon completion of this pretreatment test period, experimental subjects were assigned to their groups. Those learning the TM technique (Members of Group 1 and Group 2) were instructed by qualified teachers of TM. As a condition of their participation in the study, these subjects had agreed to meditate regularly (at least 80 per cent of the prescribed time). Those subjects who were to study the theoretical basis of TM (members of group 2 and Group 3) began the SCI course. Classes met twice weekly for one hour each session. As a condition of their participation in the study, these subjects had agreed to attend these classes on a regular basis (at least 80 per cent of the total number of classes). All 80 subjects were required to be available for both pre- and post-treatment test sessions and were asked not to begin any new self-development programs during the course of the study.

At the conclusion of the SCI course 14 weeks later all subjects were again tested with the same instruments used earlier. All tests were scored by computer and submitted to computerized programs for appropriate statistical analysis.

The results of the present study support data of earlier research by further demonstrating the positive changes in psychological variables resulting from the practice of the Transcendental Meditation technique. These findings also indicate that this improvement in psychology is primarily the result of the
actual practice of TM and to no significant degree the result of exposure to the theoretical material associated with TM.

The present research did not examine the possibility that those who learn the TM technique and participate in an SCI course may be more regular in meditation over an extended period of time. Regularity of meditation has been shown to enhance the effects of the practice, and those who both learn the technique of TM and participate in the SCI course undoubtedly have a more profound understanding of their experiences related to meditation. They also have more frequent contact with teachers of TM than those who learn only the technique, which probably promotes regularity. Over the relatively short time span of this study, the subjects who learned only the TM technique performed as well as those who both learned the TM technique and studied SCI, which demonstrated the efficiency of the practice, over longer periods of time, when regularity in the practice may become evident, but the long term effects of the SCI course on regularity were not studied here. Further-more, one would not expect a theoretical course to influence measures of personality and nonverbal intelligence. However, the science of creative intelligence should produce significant improvements - in comprehension, especially of inter-disciplinary relationships. The designed of the present study required that, as a pre-condition of their participation all students who learned the TM technique meditate regularly, Regularity was required to assure that all subjects were participating to a similar degree in the treatment condition to which they were randomly assigned, Under this artificial constraint, the effect of participation
in an SCI course on regularity of the practice over the first weeks after instruction in TM could not be determined and should be studied in future research.

Although the present study was not designed to determine if the How throne Effect may have contributed to observe changes related to the practice of the TM technique, the results do lead themselves to an analysis that shows that these is not the case. If the observed improvement in subjects practicing TM were a product of any special treatment these subjects may have received as participants of this research, one would expect similar improvements for participant subjects who studied only the theoretical concepts associated with TM through the SCI course. Although these subjects may not have done as well as those subjects who also learned the TM technique, they would have done better than those subjects who composed the control group and who did not participate in any experimental treatment. The results, however, show that there were no significant differences in performance between those subjects who did not learn TM, but did participate in the SCI course, and the control subjects.

Therefore, the Howthorne Effect does not appear to have contributed significantly towards observed improvements.

These promising results, using measures not reported before in the TM Research literature indicate the effectiveness of the Transcendental Meditation program.

Increased creativity and intellectual performance (the “9) factor of intelligence) are particularly note-worthy benefits. The improvement in important psychological and intellectual variables,
in conjunction with effects pointed out in other research on the TM program, points to the potential benefits for high school students. Future researchers could profitably investigate the full effects of incorporating the Transcendental Meditation programs and the science of creative Intelligence Course in high school curricula.

**F. 4:** Donald E. Miskiman has tried to study the impact of meditation on Performance on Learning

All subjects were unpaid male and female University under-graduate within the age range 18-24 yrs. With a mean age of 20 years. They were all from a parental background within the socio-economic indices 52.07 - 76.01 (1) and were within the Quick Test IQ range 96-115, with a mean IQ of 106. The TM group consisted of ten subjects randomly selected from 21 volunteers. They had been practicing Transcendental Meditation regularly (20 minutes each morning and evening) 6-24 months. The nonmeditating group also consisted of ten subjects randomly selected from 21 volunteers, none of whom had past or present experience with type of meditative practice.

Performance on a learning task was tested by inquiring the subjects to discover the path through a maze. The path was in the from of a series of holes, 3/8 in. in diameter in a piece of 1/4 in. black plastic 81/2 x 11 in. The maze was covered by a second sheet of 1/4 in. plastic with a grid of 366 holes each 3/8 in. in diameter. A sheet of paper was inserted between the maze and the top sheet of plastic, thereby hinding the maze. The subject, attempting to discover the pattern of the maze khose a hole either by guessing or by remembering from previous trials. Using a pencil, he attempted
to perforate the paper covering the hole. If the choice was correct the paper was perforated; if not, a pencil mark remained on the unperforated paper.

All subjects were told that their task was to learn the path through the maze, that the goal of the task was to complete the maze correctly three consecutive times, and that time was not a factor. They started from the top row of holes and moved either horizontally or vertically to an adjacent hole until they reached the bottom row of holes. If they could not perforate the paper at a hole (indicating incorrect move), they returned to the last correct position and selected another hole when they completed the mazes, a fresh sheet of paper was immediately inserted and they started gain.

Maze learning often involves massive “intra-directional interference” (in this case, the selection of alternate directions and moves from a wide variety of possibilities). The high drive state of the anxious subjects will multiply these interfering response tendencies. Since the habit strength of the incorrect interfering responses will often be greater than that of the correct response, high drive will make it even more likely that subjects will respond incorrectly.” (3) Thus, anxiety associated with high drive reduces performance. When anxiety is reduced, performance improves in complex learning tasks involving a competing response situation, such as the present one (4). This relationship between anxiety and response suggests a possible explanation of these results - by reducing anxiety TM reduces the effect of interference and thereby promotes superior expressing of learning ability.
Observing and tailing with the subjects suggest however, that selective attention is also an important factor and one that would clearly explain the data. If the meditators attended more efficiently to the task than the nonmeditators and were distracted less by irrelevant stimuli, their performance would probably be superior. Wallace (5) discusses a neuro physiological mechanism that may be involved in the TM technique that would explain how irrelevant stimuli may be filtered out more efficiently in meditators. Enhancement of the interactions among the hypothalamus, the thalamus the reticular activating system would decrease irrelevant sensory input to the thalamic nuclei. The result would be reduced ‘noise’ in the nervous system. On the psychological level it is apparent that input passes through the sensory system and stimulus analysing mechanisms before excising its representation and previously encountered material determine the relevance and sequence of sensations at each moment. That material which is most appropriate (as determined by the combination of external and internal inputs) is selected for further analysis. The TM technique may be aiding in this filtering process by reducing ‘noise’ in the nervous system as well as by enhancing the selectivity and effectiveness of attention.

This intriguing result implying the expansion of one’s ability to learn and to focus attention effectively as on consequence of practicing the TM technique should be thoroughly explored in longitudinal studies.
F.5: Allan I. Abrahams has tried to study the impact of meditation on paired associated learning:

All subjects were members of the undergraduate student population of the University of California of Berkeley. Nonmeditators (NM) were recruited through the campus placement centre. Experience of meditators (TM) were randomly selected from mailing list of the students International Meditation Society and contacted by telephones. Beginning meditators (BTM) were recruited at introductory lectures hand at the Berkeley Center of the Students’ International Meditation Society. All subjects were requested to attend three sessions, each one week apart and approximately one hour in length.

Ten experienced meditators (mean = 28 months experience, SD = 13.6 months), six beginning meditators (less than three months experience) and 12 non-meditators participated in first session, Eight experienced meditators, four beginning meditators and eight meditators took part in the second session, and six experienced meditators, three beginning meditators, and five non-meditators returned for the third session. Non-meditating subjects were told that the experiment was a standard learning experiment; TM and BTM subjects were told that the purpose of the experiment was to measure learning changes due to TM. None of the subjects were aware that they were to be tested in the same room with people from other groups.

Group of five to ten subjects, which included members of each experimental group were presented with paired associate lists played on a Wallensak tape recorder. Each item on these list
consisted of a three letter nonsense trigram (5-term) followed by a meaningful word (r-term) that subjects were to associate with the three letter trigram (s-term). Lists consisted of ten pairs.

The anticipation method was used for learning trials i.e., the presentation of each nonsense trigram (s-term) was followed by a four-second silence during which the subject could guess at its associated word. The trigram was repeated followed immediately by its associated word (r-terms). Each learning trial was alternated with a test trial in which each trigram was read at seven second intervals; subjects were directed to recall the associated words if possible and record them on answer sheets.

Non parametric tests were used to measure interaction between acquisition, retention and intertrial activity, to inspect for trends in correlation of amount of meditation experience and acquisition rate, and to make pairwise and combined comparisons of acquisition and retention among three groups.

These results provide preliminary support for the hypothesis of this study. The first hypothesis that TM subjects would acquire paired associates faster than non meditators, was supported by the significant difference in acquisition rate between experienced meditators and non meditator in all three lists. The fact that there were no significant differences in acquisition rate between non meditators and beginning meditators suggested that meditators prior to beginning the TM technique are not different from non meditators and that the TM program is indeed responsible for the significant differences in acquisition rate between the
nonmeditators and the experienced meditators. A longitudinal study would strengthen this preliminary conclusion.

Both tests related to the second hypothesis that the TM program would enhance retention of material gave results in the direction of confirmation. Experienced meditators (TM group) showed significantly superior short-term and long-term retention and recall. However, since they also acquired materials more efficiently, it is difficult to distinguish better acquisition from better recall on the recall tests.

Future research designed to extend these preliminary findings could employ groups matched for age, sex and most importantly intelligence to control for differences in learning ability between groups due to the self-selection of those who choose to learn the TM technique.

2.3.G Miscellaneous:

G.1: Andre Tjoa has tried to study the impact of meditation on Intelligence:

Subjects were College and University students and adults attending introductory lectures on the Transcendental Meditation Program help in many places throughout the Netherlands. One hundred thirty nine subjects volunteered to take the pretests prior to starting the T.M. program. The sample included 82 males and 57 females, with a mean age of about 31 years, standard deviation 4.92 years, which was rather large due to a few elderly subjects. The younger subject was 16 years old.

The test used was the Amsterdam Biograpische Vragenlijst (14) the same Questionnaire as that used in the pilot
study. Test scale are Neuroticism (N) somatic Neurotic Instability (NS), Extraversion (E), and the Tendency to endorse exceptionally socially desirable, but nevertheless very improbable, statements (T) (a kind of “Fake-good” measures. Also, the same type of figural reasoning intelligence test as that used in this study (5). However, the one used in this study had a higher ceiling, for exploratory purposes the Vragenlijst best Habitude Ahtie Bereidheid (HAB) (Activity Tendency Questionnaire) (3) was added to the battery, but was administered only in the Post-test sessions. The HAB purports to measure the tendency to be active.

Unexpectedly, the initial number of retest volunteers was quite low. Subjects were later visited in their homes, and eventually tests were sent out to subjects by mail or collected afterwards. In all, 73 subjects were finally retested. These respondents also filled out a Questionnaire that indicated whether had started TM and ascertained, for a series of three month periods, the percentage of days they had meditated twice (as instructed), only once, or not at all. Subjects were also asked whether they had been regular in the spacing of their meditation i.e., whether the time interval between meditations had been variable or relatively constant.

Sacrificing control of the time allowed to take the intelligence test for the sake of substantial returns of tests created a serious quandary about how to score the intelligence tests. This instrument had been given during pretesting as a timed test (20 minutes). In the retest sessions the imposition of time constraints had to be given up. However, the incomparability of pretest and
retest conditions was possibly less than it seemed at first glance, because the retest conditions were the same for all, in that everybody could attempt all the items. Nevertheless, the following three change scores (retest minus pretest scores) were calculated in an attempt to control for the difference in the testing procedures. First, a straightforward comparison was made between a subject’s number of correct pretest answers ($I$). Therefore, the first change score computed was $I_2 - I_1$. Second, to control for the retest time factor we scored a subject’s retest only for those items that had been attempted during the Pretest($I_2$). Therefore the second change score was the number correct on the retest of those attempted on the pretest($I_2$) minus the number correct on the pretest ($I_1$). $I_2 - I_2$, so by controlling for the number of attempted item. We imposed some time control. As a third control measure we worked with the percentage of correct responses, i.e., the number of correct items divided by the number of attempted items. Therefore, the third change score was the difference between the percentage correct on the pretest ($I_1\%$), $I_2\% - I_1$. Apart from the effort necessary to ensure sufficiently retest data and the problems thus created, it was clear from the start that the eventual retest group would have relatively few nonmeditating subjects, i.e., subjects who had not started the Transcendental Meditation technique. Only a small number of non starters could be retested, since most of them, although participating in the pretest sessions, declined to give their names and addresses (category untraceable).

However, on the basis of the data gathered in the pilot study, it was expected that not all the meditators would be
completely regular (would practice TM twice a day every day). Therefore, comparisons were planned between regular meditators and irregular meditators. In order to determine how regularly subjects had been meditating after they began TM, they were asked to indicate on the retest what percentage of the time they had meditated twice a day, once a day, or not at all, totaling 100 per cent, for a series of three-month periods extending back to the day on which they learned TM. This percentage were weighted (multiplied) by one, one, half, or zero, respectively.

Measures of regularity of TM correlated significantly with improvement in intelligence test scores, whereas there were no significant correlations between regularity and the intelligence have rate values. For the TM experimental groups, consisting of the most regular meditators, all three intelligence measures used showed significant increases. For the TM control groups (irregular meditators) only two intelligence measures the improvements in intelligence were significantly greater in the TM experimental groups than in the TM control groups.

One issue requiring discussion is the lack of experimental control in the actual retest situation. Most people completed their retest at home without supervision. It is obvious that test results, especially the intelligence test, could have been influenced by this situation. There is no guarantee that the subjects tried the items without outside help. Furthermore it might be argued that the regular meditators were very motivated to show improvements, which would urge them to work harder and longer on the items. On the other hand, the irregular meditation might have
done their best also in order to see the lack of supervision during retesting as a random noise condition and not as a systematic error factor.

Significant correlations were found between the regularity of TM and the changes on the neuroticism and somatic neurotic instability scales. Within the TM experimental groups, decreases in neuroticism and somatic neurotic instability were fairly dramatic within the control groups changes on these two variables were not significant. Changes on the extraversion scale were slight. On Extraversion the differential changes between groups neared significance only because The TM Experimental groups increased somewhat on Extraversion, whereas the TM control groups decreased, on a measure of activity (post test only) the TM experimental groups scored significantly higher than the control groups. In no instance were significant changes found on the fake good scale.

Another problem in this study was that of self-selection of subjects. It was not known whether the pre test volunteers of this study were solve how different from the larger groups of people attending introductory lecture on the Transcendental Meditation program or not. Also, only a portion of the initial group was retested. However, it was possible to gauge the seriousness of this factor. Comparisons were made between those who had been retested and those who had not. None of the t-tests between groups on any pretest measure were significant.

Another problematic factor in this study was the variability of the time interval between the pretest and the retest.
However, the interval between pretest and retest was not significantly different in the experimental and control groups. Also, when the correlations given in table were converted to partial correlations by partialing out the time-interval variability, none of the correlations changed significantly, and most actually increased in magnitude.

Thus, this study showed that over an approximately 10 month period, the regular practice of the TM technique produced significant increases in intelligence and significant decreases in neuroticism and somatic neurotic instability. These changes were significantly greater than those observed among a control group of irregular meditators. Also those who meditated regularly for about 16 months had a greater tendency to be active than those who did not meditate regularly.

The observed improvement in intelligence was particularly noteworthy because fluid intelligence, which is generally measured by nonverbal intelligence tests such as that used in this study, usually does not improve after adolescence and often decline after the age of twenty (2 to 19) Cattell and Butcher (2) state that fluctuations in fluid intelligence should occur only with fluctuations in general physiological efficiency. Therefore, the improvement in fluid intelligence brought about the regular practice of the TM technique was not unexpected. Numerous studies have shown that the TM technique produces a unique physiological state of deep rest (10, 11, 12). Moreover, a recent study suggests that during TM, brain waves become more coherent (6). As a result of the physiological changes occurring during the TM technique,
certain long term changes in physiological function outside of meditation appear to accumulate. For instances autonomic stability increases (7) perceptual ability become more refined (8), and blood pressure decreases among hypertensive patients (1). Thus, physiological efficiency improves, and as a result fluid intelligence should improve also. This prediction has been verified by the present study.

Fluid intelligence is a measure of the ability to learn, to adapt effectively to new situation, and to perceive complex relationships. Therefore, the TM program, by improving this type of intelligence should enable a person to behave more effectively in a wide variety of situations - a prediction that has received support from initial studies of the effects of the TM program and that deserves further investigation.

G.2 : Theo Fehr, et.al. have tried to study the impact of meditation on, Personality Traits :

Instrument - The Freiburger personality Inventory was published in its present form in 1970 (1). The inventory includes 212 items that are grouped into nine independent scales. The items of each scale pertain to a specific personality factor, e.g., nervousness. Each item is analyzed for one factor only, resulting in the mathematical independence of the factors, which however, correlate partially with regard to content, e.g., nervousness and depression. The nine scales are Nervousness, Aggressiveness, Depression, Inhibition, and openness. Moreover, three additional scales have been developed that do not possess mathematical independence from the other scales. These are defined by regrouping the items of the nine
basic scales. These additional scales are Extraversion Vs Introversion, Neuroticism Vs. Emotional Stability, and Self-reliance (Masculinity) Vs Dependency (Femininity). According to the FPI manual, “Individual differences in the magnitude of these nine (respectively twelve) test values represent differences among individuals in the realization of the relevant (Personality) factors. The quantitative values so obtained allow us to arrange the individuals in order or precedence with respect to the various quantities.” (1)

The openness scale can be regarded as a scale of honesty. It gives information about possible tendencies to attempt to respond to the items in the most socially desirable manner and so allows the estimation of the reliability of the other scores. For the present study, such a scale seemed desirable. It was hypothesized that the meditators would not differ significantly from the comparison group on that scale. Investigations of the reliability of the FPI so far have yielded good results (2).

Subjects: For the purpose of this pilot study, it was convenient to use participants in a conference for teachers of TM as subjects. The conference was held at the Academic fur personlichkeitsentfaltung in Bremen; all were from the Federal Republic of Germany. These subjects of course practiced the TM technique.

Procedure: The procedure for the examination was as follows: The subjects were first asked to participate in a scientific study to determine the effects of TM on personal development. Instructions were then read aloud from the first page of the questionnaire. No further statements were made regarding the testing procedure or the
component parts of the examination. Questions concerning the meaning of the instructions were answered by the group filling out the questionnaire. Subjects were given the option either to remain anonymous or to state their names.

The results of the comparison of the meditating group as a whole with the normative group can be expressed according to the categories of description in the FPI test manual. Compared with suitable norms, people who regularly practiced TM showed the following:

- Less nervousness, less psychosomatic disturbance.
- Less aggressiveness and emotional immaturity, more self-control.
- Less depression, more self-confidence and contentment.
- Less irritability, more tolerance and calm in frustrating situations.
- Greater sociability, liveliness, and friendliness.
- Greater self-assuredness, self-confidence, and good humour.
- Less tendency to dominate, more tolerance, cordiality, and flexibility.
- Less inhibition, greater spontaneity, naturalness, and readiness for activity.
- Less neuroticism, less tension, and greater emotional stability.
- Greater self-reliance and self-confidence, more vigor, and more balanced mood.
At the same time, the meditation showed no significant difference from the normative comparison group on the openness scale. Since this scale measures the extent to which people are attempting to respond in a socially desirable way on all the scales, these results indicate that the meditators were not attempting to respond in a socially desirable manner to a greater degree than the comparison group. Therefore, it seems that the more positive and healthy scores of the meditators on the FPI cannot be explained by the argument that the meditators were trying to appear better than really were.

Furthermore, comparisons of the differences between the short term and long term meditators and normative comparison groups showed that the short-term meditators differed significantly from the comparison group on two scales, whereas the long-term meditators differed from the normative group on nine scales. Therefore, the effects of practicing the Transcendental Meditation technique seem to grow over time.

Though conclusive evidence of the cumulative effects of TM on the traits measured by the FPI cannot be obtained from a cross-sectional study such as this, these results suggest that the TM program produces significant reductions in negative personality traits and improvements in positive traits resulting in a continuous, balanced, holistic growth of the entire personality. A longitudinal study is now in progress to test more rigorously the findings of this study.

**G.3**: Safia Ahmad, et.al. have tried to study the impact of meditation on Personality trait.
Sample: The sample for the present study consists of 100 subjects (50 meditators and 50 non-meditators). The subjects ranged between the ages of 25-50 years. Within mean age of their educational level ranged from higher secondary to M.A. The subjects in two categories i.e., Meditators and non-Meditators were matched on age, sex, educational level income and occupation. The meditators were selected from Maharshi Institute of creative Intelligence and Modern School T.M. Centre. New Delhi. Only those Meditators were chosen who were practicing T.M. regularly for a minimum period one year. Whereas the non-Meditators neither practice T.M. nor any other technique of Meditation.

Test Materials:

Two tests were employed in the present study for comparing the meditators and non-meditators (1) sixteen personality factor questionnaire - form a (1961), which provides measures on 16 major personality traits (2). Rotter incomplete sentences Blank (1950), the test provides an index of mental health.

Procedure:

The meditators were contacted through initiators of their respective T.M. centres and were given the test after 20 minutes of Meditation. The tests were administered individually in two sittings. The non-meditators were tested at the places convenient to them. Rotter ISB was given first followed by 16 P.F. The testing time for each subject ranged from 1 hour 40 minutes to 2 hours.
Discussion:

The results indicate clearly that meditators and non-meditators differ significantly on twelve out of the sixteen personality factors. In the case of four personality factors of the scale (H, I, Q₁, Q₂) no significant difference was obtained between the two groups. It has been observed that meditators have secured higher mean score than the non-meditators on most of the personality traits (A, B, C, F, H, M, Q₁, Q₂, Q₃), meaning thereby that they tend to possess numerous positive personality characteristic—they are warm hearted, good natured, co-operative, emotionally stable, easy going, more realistic, less dominant, cheerful, enthusiastic, more practicable, careful, genuine, simple, self confident, relaxed, composed, satisfied etc. Since these qualities are less pronounced among the non-meditators, the differences in the personality traits can be attributed to regular practice of Transcendental Meditation. The result are supported by Fehr (1974) Ferguson and Gowan (1976) Hjelle (1974) orme. Johnson (1973), Schilling (1974), Shapiro (1974), Stern (1974) and Tjora (1972).

In the case of second order Personality Factors significant difference was observed between meditators and non-meditators on Factor I. The meditators were found to have been anxiety than the non-meditators. However, on the remaining three factors the two groups possess average score and no significant difference was obtained between them. The findings are supported by Davies (1974) and Stern (1974).
The result of Incomplete Sentences Blank shows that meditators are significantly better in their adjustment and general mental health than non-meditators. The findings are supported by Benson and Wallace (1972) and Brautigam (1972).

Behaviour therapy brings quick results in certain cases, whereas the T.M. Programme provides comprehensive psychological integration. T.M. as a technique if combined with behaviour therapy would yield durable results (Bloomfield, 1975). It may be concluded from the present study that individuals practicing T.M. regularly have better mental health, better adjustment and they also possess positive personality traits as compared to non-meditators.

**G.4:** Uday Jain has tried to study the impact of meditation on Personality functions:

The present study empirically examined the impact of short term Preksh Dhya meditation training on certain personality variables. The Preksha Dhyana involves relaxation and concentration on different body parts before and after 15 days training in Preksha Dhyana Meditation.

30 male adults received measures of Anxiety, concentration, span of attention level of aspiration and conforming to the group norms. A matched normal group of 30 subjects received these measures on the same occasions without undergoing the training. The results showed that the training in meditation reduced anxiety and increased the degree of concentration and span of attention. The present results are discussed in the light of Patanjali Yoga theory and self regulative approach to deliberate
physiological changes. It is argued that self initiated concentration on different body parts brings changes in the physiological events which lead to changes in cognitive and personality functions.

2.4 MAJOR CONCLUSIONS OF THE STUDIES:

2.4.1 Physiological condition:

(1) Physiological Responses:

EEG alpha suppression and skin conductance response both showed clear habituation that did not differ among groups.

(2) Internal Physiological Changes:

The frequency and length of these breadth suspension episodes were substantially and significantly greater for T.M. subjects than for control subjects relaxing with eyes closed.

(3) Physiological Condition:

While T.M. and non treatment exhibited different psychological patterns, none of the technique showed a clear superiority in reducing physiological arousal.

(4) Physiological

(1) Meditation group showed significantly lower EMG levels at the end of treatment than did the control group.

(2) Meditation offers a viable alternative as a relaxation procedure requiring little time to learn and devote at any performance criteria levels.

(5) Physiological condition:

In both autogenic training and siddha meditations, there is a slowing of the heart rate, reducing of blood pressure, and increase in cortical discharges in the brains.
(6) Physiological condition:

1. The T.M. group displayed more significant decreases during meditation and during activity than did the progressive relaxation group.

2. Both groups displayed significantly lowered metabolic rates during T.M. of progressive relaxation.

(7) Hemispheres and Meditation:

Phenomenological and psychological data on meditation does not fully support the right hemisphere hypothesis.

(8) Physiological condition:

1. State effects of meditation appear to include decreased electro cortical arousal.

2. Meditators more readily demonstrate alpha and that activity demonstrate alpha and that activity than non-meditators, even when non-meditating.

3. Meditators appear to show both stronger orienting and recovery responses to stressors while meditating than controls.

4. Depending on the individual in experienced meditation may report sleep, hypnogogic reveries, trance, or abreaction, during practice.

(9) Reflect time:

While no significant differences in reflex time where observed in pre- and post-treatment, significant reduction in reflex time was found.
2.4.2 Psychological Responses:

(A) Small but significant condition effect for all variables except diastolic blood pressure.

(B) Non-meditators and ETM subject showed lower psychological arousal during meditation.

(C) ETM subject tended to become more relaxed over meditation traits, while non-meditators showed opposite trend.

(2) Focusing:

Focusing appears to have the effects of “grounding” her experience of Meditation.

2.4.3 Behaviour:

(1) Neurotic Behaviour:

Meditation appeared to be more rewarding for subjects with milder complaints.

(2) Smoking Behaviour:

(1) Significant decrease in smoking behaviour and beneficial results from meditation-hypnosis.

(2) Individualized approach and a combination of techniques are used; long term success in smoking cessation cannot be achieved. If the patients are under severe stress and have little or no social support.

(3) Non-attending Behaviour:

The test for pre- to post-test mean change differences of non-attending behaviour for the 2 groups reflected a significant reduction in the number of non-attending behaviour for the treatment group.
2.4.4 Positive Traits:

(1) Peace, Co-operation, Understanding:
   (1) Prayer and peace, facilitate and are facilitated by awareness, openness, service, morality, love and holiness.
   (2) Prayer and meditation can also facilitate co-operation and understanding.

(2) Self perception and Expectation:
   Frequent practice of T.M. was found to be related with improved perception of self and increased expectation.

(3) Positive personality Traits:
   (1) EEG patterns also appeared to stare down during meditation, with greater display of synchronization.
   (2) Other subjects were enhanced perceptual clarity heightened awareness perceptual clarity, stressful stimuli, an altered-sense, or openness to new cognitive experiences.

(4) Relaxation:
   (1) It is suggested that the very act of meditation reduce arousal and increases relation.

(5) E.S.P.
   (1) Results suggest that E.S.P. occurs more frequently during hypnosis than during Transcendental Meditation.

2.4.5 Negative traits:

(1) Anxiety:
   (1) Meditators group displayed significantly greater decreases in their anxiety.
   (2) Subjects highest in hypnotic responsivity showed the most substantial decrements in anxiety.
(3) Hypnotic responsivity is not increased by practice of meditation.

(2) Anxiety:
(1) ANOVA did not yield significant differences between meditators and non-meditators.
(2) Shock avoidance task effectively produced anxiety.
(3) T.M. is not an effective means of reducing autonomic responses to stress.

(3) Chronic anxiety:
(1) After six weeks post-treatment observation period 40% of subjects had a clinically significant decrease in their anxiety.
(2) There were no differences between treatments with respect to treatment efficiency on set of symptom amelioration or maintenance of therapeutic gains.
(3) Relaxation therapies as a sole treatment appear to have a limited place in the treatment of chronic anxiety.

(4) Trait anxiety:
(1) At post test the T.M. group displayed more significant and comprehensive results (decreases in Neuroticism/stability, Extraversion/Introversion and drug use) than did the progressive relaxation group.
(2) Both group demonstrated significant decreases in state and Trait Anxiety.

(5) Trait Anxiety:
(1) Clinical standardized meditation group showed significant decrease in Trait anxiety.
(2) practice time correlated with anxiety reduction.
(6) Stress:
   (1) Meditators reported more job-satisfaction, improved performance, less desire, to change jobs.
   (2) Meditators show better inter-personal relationships and decreased climbing orientation than non-meditating colleagues.
   (3) Meditation practice reduces occupational stress.

(7) Tension, Social relations:
   (1) Meditation produced significantly lower ratings of tension than did the baseline or control condition.
   (2) Meditation had no effect on rating of social relations.

(8) Mental retardation:
   (1) It was found that the subject experienced spontaneous improvements in her verbal and social behaviour and physiological functioning over a period of 3 years while practicing the technique.

(9) Pain distress and pain sensation:
   (1) The mean distress level for the T.M. group was significantly lower than for controls.
   (2) Pain sensation level for the T.M. group did not differ significantly from controls during either trial.
   (3) Heart rate and skin resistance changed for both groups in the expected manner, with no significant differences between groups.

(10) Neuroticism:
   Meditators were lower on neuroticism than non-meditators.
2.4.6 Learning:

(1) Concentration ability:
   (1) Meditation had no measurable short-term effects on concentration.
   (2) The subjects experience of meditation was not correlated with the concentration score.

(2) Memory:
   T.M. Subjects performed significantly better than non T.M. subjects on the post-test.
   T.M. subjects performed significantly worse than the non T.M. subjects.
   Effect of meditation may depend on which hemisphere is dominant in performing the task.

(3) Cognitive effects:
   (1) Practice of meditation had no systematic effect on the variables assessed.
   (2) ANOVA indicated that the drop-outs were significantly younger than those who completed the study.

2.4.7 Miscellaneous:

(1) Suggestibility:
   (1) Meditation exercises lead to a narrowed state of consciousness characterized by increased suggestibility.
   (2) Suggestibility:
   (1) Subjects were significantly more suggestible during meditation than during rest.
(3) Alcoholics:

(1) Effect of T.M. was not found significant on alcoholics and individuals with emotional problems.

(4) ‘Mindfulness’:

(1) Meditation may viewed as a series of mental exercises in which “mindfulness” is more than a process of simple relaxation.

(5) Rorschach responses:

(1) The samadhi group, who concentrated on a single object without distraction, showed significant unproductivity and paucity of associative elaborations.

(2) The insight group showed increased productivity and richness of associativeness and conceptual elaborations.

(3) The advanced group usually perceived inkblots as an interaction of form, energy, and space.

(4) The higher level, the master’s group demonstrated integration of all 10 cards into 1 universal theme or concept.

(6) ESP rating:

(1) Most extreme ESP deviations occurred among subjects reporting the most pronounced alterations of consciousness.

(2) One of these scales, representing the hypnogogic nature of the experience, correlated positively and significantly with the ESP scores based on the independent judges ratings.

(7) Hypnotic Susceptibility:
(1) Subjects defined as motivated to participate in the study did not differ initially in rate of intrusions from subjects who were unmotivated.

(2) Motivated subjects reported fewer intrusions than unmotivated subjects.

(3) Intrusion rate correlated significantly with hypnotic susceptibility.

(8) Hypnotic responsivity:

(1) Meditation does not seem to enhance hypnotic responsivity.

(9) Perception:

(1) Meditation may increase rated perception of others.

(10) Actual selves:

(1) Result showed a systematic pattern of significant changes, over the 3 tests.

(2) Meditation came to perceive their actual selves as being increasingly similar to their ideal and social selves and developed a more strongly defined concept of their actual selves.

2.5 SUMMARY:

Sixty five studies on meditation were reviewed. In only six studies negative results were reported. In all other studies positive impact of meditation on various variables was found. Particularly meditation seems to have positive impact on mental-health.

All the studies done to find out the impact of meditation on stress, anxiety showed very encouraging results. Studies showed clearly that meditation decreases the level of stress.
and anxiety significantly. Though studies on frustration were not there but there were some studies on tension and other negative traits. Here also it was found that meditation brought out positive results.

Thus, the investigator was inspired to see the result of meditation on stress, anxiety and frustration.

Next chapter describes the plan and procedure of the present investigation.