Exploring the Sub-conscious using New Technology

(with 137 references + bibliography)
Third enlarged edition

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"… After using the electronic device for 10 minutes, I was very surprised to suddenly see a dark ghostly forest of trees, in twilight, moving slowly across my field of vision. The trees were in sharp focus, vivid and highly stereoscopic, not like a flat picture, and they maintained their correct relative perspectives as they slowly passed from right to left, which made me feel exactly that I was present in that forest. My eyes were closed, but I was fully wide awake … ."

The Author, Chapter A (ii)

"I found myself within a forest dark ... I cannot well repeat how I entered, so full was I of slumber at the moment ... . But still we were passing onward through the forest, the forest, say I, of thick crowded ghosts."

Dante (1300)

"... in the forest of the night ..."

William Blake (~1800)

"When I took ayahuasca, which contains N,N-dimethyl tryptamine (DMT), I saw a dense Amazonian forest just outside my window, instead of the normal suburban view outside!"

A taker of DMT (2012) [NOT the present author!]

(The natural brain neurotransmitter serotonin is closely related to the DMT molecule, and it can be converted into DMT by the pineal gland when suitably stimulated.)

C.S. Lewis * wrote that at the back of the wardrobe, the entrance to Narnia was just beyond some trees there, which may have been a vision which he himself had experienced? In an actual wardrobe, CO_2 narcosis, known to submariners, would occur. Very unwise! See "Mechanism" section in Chapter A(ii).

* *The Lion, the Witch and the Wardrobe*

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CONTENTS

DISCLAIMER: 4
PREFACE: Visualisation; Summary of chapters 5; 6

CHAPTER A New Practical Methods for: 9
(i) Lucid dreaming 10
(ii) Fast achievement of Visual Imagery: 31
An exploration of what lies beyond the normal 5 senses:
Viewing a non-physical world while wide awake.
Appendix 1: Edison's Method. *Appendix 2 & 3*: Circuits &c.
Appendix 4: Other Applications 80
Appendix 5: Attempts by psychologists to suppress Chapter A (ii)
Appendix 6: Auxillary MP3 player. *Appendix* 7: Troubleshooting.
CHAPTER B Remote Viewing 97

CHAPTER 1 Introduction 111

CHAPTER 2 Brain activity 114

CHAPTER 3 Left & right brain hemispheres 117

CHAPTER 4 Mind training 123

CHAPTER 5 Drugs, narcotics, opiates 128

CHAPTER 6 Biofeedback 131

CHAPTER 7 Light and Sound machines: 132
Left & Right Brain synchronising

CHAPTER 8 Electro-encephalograph (EEG) units 142

CHAPTER 9 Pathworking 147

CHAPTER 10 Sensory deprivation - flotation tanks 149

CHAPTER 11 Other machines - cranial electrical stimulators (CES), Ganzfeld units, Dream machines 170

CONCLUSION 173

REFERENCES (137 references + Bibliography) 174

Appendix 8 Collected procedures for Chapter A (ii); **CAUTIONS** 185; **188**

To
C. Maxwell Cade and Geoffrey Blundell
Pioneers in Biofeedback

"The normal waking state is neither the highest nor the most effective state of which the human mind is capable. There are states of vastly greater awareness which one can enter briefly and then return to normal living, enriched, enlivened and enhanced."
- C. Maxwell Cade & N. Coxhead.

"Then only is our life a whole -- when action and contemplation dwell in us side by side, and we are perfectly in both of them at once."
- Jan van Ruysbroeck.

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……
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Related products can be obtained from: www.toolsforwellness.com and others, or by typing search words into a Google search.

Information not covered in this book: You may be interested in the effect of strong magnetic fields on the brain. A free download of "Guide to Magnetic Stimulation" by R. Jalinous can be obtained from the website of The Magstim Company Limited, UK. (Contact below for a copy if it cannot be found).

The aim of this book is to avoid psychoactive drugs and to obtain similar results using other methods, such as electronic devices. Entry to advanced meditation is facilitated, and, the book is relevant to mind-states leading to inventive ability in technology.
Important: See Warning on last page (page 188).
Correspondence to: mgh@4-D.org.uk

List of Figures

Fig. 1 to 3 Electro-encephalographs of brain states 32
Fig. 1.2 Head light & sound inputs 35, 95
Fig. 2 EEG of untrained mind 40
Fig. 3 EEG during traditional meditation 40
Fig. 4 EEG during advanced meditation 40

Fig. 5 a&b Author's light & sound device circuits 41
Fig. 6 EEG graph 43, 71
Fig. 7 Author's light & sound circuit enclosure 42
Fig. 8 Eye lamps spectacles 44
Fig. 9a Printed circuit layout board for Fig. 5a 50
Fig. 9b Printed circuit board for Fig. 5b 52

Fig. B.1 A vision 98
Fig. B.2 A vision 99
Fig. A8.1 Tesseract 102
Fig. A8.2 102
Fig. A8.3 Tesseract 103

Fig. 1.1 Electrical Brainwave Frequencies 115
Fig. 2.1 Electro-encephalograph (EEG) patterns 118
Fig. 3.1 Mandala 120
Fig. 4.1 Biofeedback of brain state by colours perceived 139
Fig. 5.1 Binaural Beats 139

Fig. 6.1 A Maxwell Cade workshop 146
Fig. 7.1 Flotation tank 150
Fig. 6.2 Tarot Trump Card XXI 157

Un-numbered pictures in Appendix 3 are not listed above.

DISCLAIMER

No responsibility is accepted for any use of light & sound machines etc described in this book. This book contains descriptions of what the author did and experienced, and what others have reported (as referenced).
No responsibility is accepted for any adverse effects.
See **warnings** on page 188.
The instructions/procedures were written by the author for his own use, and their appearance in this e-book is **not** a suggestion or recommendation for them to be used by anyone else: this book is an account of what the author did, following the normal scholarly practice of reporting all results obtained in a set of experiments. It is not a recommendation for anyone to copy anything described in this e-book.

PREFACE

This book is for those who wish to know what may lie beyond the "normal":
There **is** something beyond what our normal 5 senses reveal.

The aim of this book is to explain drug-free methods for this investigation.
These are relevant both to mind-states leading to inventive ability in technology, and, to entry to advanced meditative mind-states.
VISUALISATION: An exploration of what lies beyond the normal 5 senses:
The author describes how he entered a state of consciousness beyond the normal 5 senses, in which he was simultaneously awake and asleep according to an EEG (electro-encephalograph) recording, which allowed perception of vivid visual images.

This expanded third edition describes this major new advance in **Chapter A (ii)**, a very rapid method for obtaining visual imagery, while wide awake, for those who can get little or no imagery with closed eyes.

This method is new, easy, quick, and really works, and was found to be effective in the first few attempts, requiring easily-constructed low-cost circuitry, and it only needed very passive attention. The simple device captures the user's attention due to its entertaining display of flashing lights, so no advanced ability of mind control techniques was required.
Important: See Warning on last page (page 188).

--o0o--

From time immemorial, visualisation seems to always have been the prerogative of a few artists or advanced meditators. For the average person, uncontrolled dreams were the only source of visual creativity.

The mingling of science and art can be seen in the inspired paintings, sculptures and inventions of Leonardo Da Vinci and Michael Angelo (The Creation in Rome and David statue in Florence).

But with the industrial revolution, further separation of the two occurred; logic and analysis took dominance. As we progress and modernise our world, this gap leaves us empty and isolated from our inner being. We probe for ways to "find" ourselves.

Yoga, meditation, chanting etc are prescribed, but in our busy lives, our progress using these traditional methods is slow. Sceptics cannot see the need or link between modern living and ancient rituals. Scientists and engineers see no meeting of paths between their analytical thinking and esoteric or intangible dreams. There is a chasm between **academic** ability and the **intuition** needed for invention, but intuition is ignored by most academics.

A few investigators however have tried to understand what lies beyond our obvious abilities. Today, major advances in electronics development has placed at our disposal a range of sophisticated techniques which we can use to examine ourselves and our brains in order to understand why the process

of visualisation occurs more readily for some than for others. A simple method is now available to allow vivid visualisation, even if none at all was possible before.

The understanding of our brain rhythms and how these are affected by our state of visualisation, relaxation, thinking etc is the corner stone of further development. With this knowledge we are now able to use electronic equipment to guide our brain rhythms so that we can achieve any desired brain-state. These techniques speed the process of visualisation, creativity, meditation, relaxation etc which take much longer by traditional means.

This book aims to explain these new techniques and the processes involved.

SUMMARY OF CHAPTER CONTENTS

Chapter A (i) describes an electronic method for inducing lucid dreams.

Chapter A (ii) describes a new fast method for vivid visual images while wide awake, with eyes closed. In the author's case, the commonest images are trees, with the author's point of vision moving slowly past them, at night or twilight, highly stereoscopic, but seeming more like ghosts of trees then trees. It is easy to stop the movement, or to see them moving in the opposite direction. After a few minutes it is possible for them to brighten up like normal daylight trees, with green leaves and branches swaying in the wind. The images were not only of trees – grey stone cottages in a village street and aerial views of a distant town were also seen.

This is somewhat like the "dream-world", and opens up the question of whether parts of it may be real (as reported by Remote Viewers), and parts of it may be virtual, which opens up the easy possibility of creating one's own virtual world while fully wide awake but without a computer!

A search through some literature revealed possible hints, from what others have mentioned:
Dante (1300) and William Blake (~1800) describe dark forests, as do some psychoactive drug takers of today. The present author takes no drugs, and the simple electronic method described in Chapter A (ii) is of course completely drug-free. But see the "Warning" section on page 188 (last page). Although Dante's "Inferno" mentions dark forests several times, the present author did not see or sense anything sinister whatsoever, while moving through the dark forests perceived when using the electronic method in Chapter A (ii) !
Important: This chapter A (ii) describes fast entry into deep meditative states which may otherwise may take years to achieve. The immediate (and drug-free) visions can be used as a starting point for advanced meditation.

Chapter B describes aspects of "Remote Viewing", used by various government intelligence agencies to observe actual real activities very far away from the observer, which is the subject of several documentary films and books.

Chapter 1 deals with creativity and gives examples of famous scientists who were able to combine visualisation with inventive and thinking ability.
A discussion of what could lie beyond our five senses encourages us to try to understand more about ourselves and our dormant capabilities.

Chapter 2 gives us the background and explains our brain activity and how this can be scientifically measured. This is explained in simple non-technical language for accessibility.

Chapter 3 explains the different functions of both our right and left brain hemispheres, and the possibility of activating the right hemisphere to increase our creative abilities; most of us have a very dominant left brain activity, for logic and deduction. The enhancement of right brain activity would therefore add a new dimension to our performance. Mind training is therefore very important and is covered in **Chapter 4**, where various traditional meditation techniques are presented, and their role in increasing visualisation is discussed.

Chapter 5 discusses the effects of drugs etc in relation to our natural physiological production of endorphins. The use of the various instruments (to be discussed in later chapters) is shown to be effective in reducing depression and has been demonstrated as an aid in alleviating drug withdrawal symptoms.

Chapter 6 defines the term "Biofeedback" and illustrates how by simply imagining or visualising a change in our state, we can actually change it. For example imagining ourselves to be colder or warmer or more relaxed etc can actually induce the real change.

Chapter 7 onwards describes various electronic equipment available on the market which can be used to help in achieving relaxation, meditation, creativity, memory etc. Light and sound technology is described and we see how simple pocket-size devices (entertaining and easy to use) can be used to synchronise our left and right brain hemispheres and how we can induce various states with the push of a button.

Chapter 8 deals with electro-encephalograph (EEG) units, which can be used to monitor the changes in our brain rhythms as we perform various tasks, and how these can be used in conjunction with biofeedback, to aid us along the path. Exercises are given to illustrate the various effects.

Chapter 9 describes a journey for the mind (pathworking). Important.

Chapter 10 describes flotation tanks and how these can be used to amplify the subconscious simply by removing the everyday "noisy" sensory input from our usual five senses, which normally "drown it out". Relaxation and drug-free imagery are immediate results, when relaxation is achieved in the tank.

Chapter 11 describes other useful electronic devices, such as the cranial electrical stimulator (CES) which can be used to reduce pain by increasing our endorphin production. Ganzfeld ('entire field') units are used to remove thoughts from our mind and help us relax. Finally, "dream machines" are used to make us self-conscious and aware in our dreams, so that we are able to guide them and remember them. These are also discussed in Chapter B.

-o0o-

The material in this book has been extensively researched, as evidenced by the large number of references which the reader can see for further information. Scientific data (described simply) is used to shed light on our behaviour and state of being, and to elucidate how this relates to our brain activity.

Training of the mind to bring out our latent creative abilities and balancing our logical minds is now an accepted concept by businessmen, sportsmen and even the US army as a means of improved performance. The techniques described in this book are now extensively used in the USA and increasingly in Europe and elsewhere.

This book is an information source for anyone interested in reducing stress, insomnia, etc, or for increasing creativity, inventive ability, learning skills etc, or exploring the subconscious through easier entry to meditative states.

Kundalini is said to be a non-physical energy residing at the base of the spine and cannot be proved by physical measurements. It is described in many books from many different cultures, mainly eastern. It is the cause of the familliar "tingling in the spine", induced by moving music, or beautiful scenery. No attempt is made to prove anthing here, and so:
"He who has ears to hear, let him hear"!

Kundalini is normally asleep in most people. As long as it remains asleep, the soul is limited, and true knowledge does not arise. Yoga can awaken Kundalini, allowing Liberation. For those interested in this aspect:

An excellent book [1] is: "Meditation", by Monks of the Ramakrishna Order, published by Ramakrishna Vedanta Centre (1972), ISBN 902479 30 3:

"*All spiritual endeavours depend on a major yearning for truth.*
Have an impression of eternity when starting to meditate, saying that you have no body, no mind, there is no time, no space; the Universe has vanished - only God IS."

-oOo-

PREFACE TO CHAPTER A (i) and CHAPTER A (ii)

The brain generates very small electric waves. These can be detected and displayed using an electronic amplifier (electro-encephalograph, EEG):

BETA waves (around 20 cycles per second, or 20 Hz) is our normal everyday thinking state.

ALPHA waves (around 10 Hz) is our state with eyes closed and all thoughts excluded from the mind, and is fairly easy to achieve. 'Thinking' usually puts us back into a **beta** state.

But it is possible to learn how to think while in the alpha state, and even to solve problems while in it, e.g. the physicist Albert Einstein was able to solve problems while in an **alpha** state.

The alpha state borders on the next-lower state, the theta state (about 6 Hz), which is responsible for creative and intuitive faculties. THETA (~ 6 Hz) is the dreaming-sleep state.

So the **alpha** state is the doorway to the **theta** state, but the everyday **beta** state is 'once-removed' from **theta**:

BETA → ALPHA → THETA → DELTA
awake → no thoughts → dreaming → sleep
20 Hz → 10 Hz → 6 Hz → 1 Hz

The inventor, **Edison,** used to relax in a chair with a metal sheet on the floor and a rubber ball in his hand over it; relaxation produces the alpha state and the deeper intuitive theta state, but this usually causes loss of beta, which means that one falls asleep. Edison prevented this happening because the ball then fell on the metal sheet, which woke him up **just enough** to maintain some activity in beta, alpha and theta, and he was then able to bring the inventions in this special state, into his aware mind. This mind-state and its imagery is of technological importance and is also relevant to meditation.

NOTE: The last parts of Chapter A (i) and of Chapter A (ii) contain practical circuits developed and used by the author for lucid dreaming, and for rapid perception of visual images while wide awake (with eyes closed). The latter, in {Chapter A (ii)} is of much more interest to readers interested in greatly improved **meditation methods** and / or in methods of increasing one's intuitive and **inventive ability** (Cf Edison's method of entering inventive mind-states). So it is **recommended** to read the author's experiences in Chapter **A (ii) first**. **Important:** See "Warning" section on last page (page 188).

CHAPTER A

A (i) Lucid Dream methods, and: A (ii) Fast Method for vivid Visual Imagery

Look within; seek thine own salvation diligently;
Even Buddhas can only point the way ... .
Every one is a Buddha already ... .

Buddha

Chapter A (i), and **especially A (ii)** give rapid methods for "looking within". Chapter **A (ii)** is the result of many years of developing a new fast method for vivid imagery. The method involves placing the mind into a state of deep sleep while *simultaneously* retaining normal fullly wide awake consciousness, using a simple electronic device. The author describes here what he did for his own use, and the reader must read the "Warning" section on page 188 (last page).

This is relevant to those who have tried meditation alone or at a retreat, but have not been able to develop any significant exploration of "inner worlds".

--o0o--

CHAPTER A (i): Lucid Dream methods

This Chapter A (i) has been published in:
http://wholistichealingresearch.com/user_files/documents/ijhc/articles/Hocking-13-3.pdf
and is reprinted here with consent: (starts on next page below).

Added note: It is recommended to first use the I-pod App (application) described below, in the way that it is intended by the App supplier, **before** adapting it to trigger lucid dreams. This enables the user to get used to it in its normal use mode, first.

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Methods for Lucid Dream Induction

Michael Gwyn Hocking, PhD

Abstract

Lucid dreaming is self-consciousness or self-awareness while dreaming. Normally, we are self-conscious or self-aware in our ordinary waking state, but not during dreams, when we are conscious but not self-conscious. In the usual dreaming sleep, the left brain hemisphere is closed down, leaving the right hemisphere active. The right hemisphere employs emotional, gestaltic, intuitive, present-oriented thinking, in contrast with the linear, reasoned, sequential, rule-bound and time-bound (past, present and future) logic of the left hemisphere. This explains why dreams are often bizarre, as there is no logic filter, which in our normal waking state, filters out illogical scenarios before they reach our normal self-consciousness. Methods for having lucid dreams are given, including a new method that requires no sensor of any type to be worn during sleep.

Key words: lucid dream, dream, consciousness, lucid dream method, stroboscope, brain hemisphere

Lucid dreaming

Lucid dreaming is self-consciousness or self-awareness in the dream-world. The dream-world may be a part of the so-called “astral” world, named as such for its self-luminous appearance, like dreams have. This is discussed below. We are self-conscious or self-aware in our normal, waking state of consciousness, but not in the dream state. That is, in the dream state we are only conscious but not self-aware, so we cannot direct our dreams. This is because our left brain hemisphere, which provides logical functions, appears to be shut down during sleep and the right brain then gives us bizarre dreams – bizarre because they are uncensored for logic by our waking-state, logical filter.

It is helpful to place lucid dreaming within a spectrum of states of consciousness:

1. Normal waking state
2. Hypnagogia: the experience of the transitional state to or from sleep.
3. Normal dreams: These are usually in colour. The dreamer is unable to direct the events in the dream, nor to filter out absurdities, which often occur. Normal dreams are often forgotten unless one keeps a dream diary on waking up.
4. Vivid dreams: These are much more striking and memorable than normal dreams and sometimes include sounds. But the dreamer is still unable to direct the dream, nor to filter out absurdities. Both ordinary dreams and vivid dreams are remembered much better if one writes down what is remembered as soon as one wakes up. By this method, one can pass from hardly recalling any dreams, to detailed frequent dream recall.

5. Lucid dreams: One becomes self-conscious, just like in one's waking state, and have the ability to consciously direct the unfolding of the dream process. The dreamer is fully self-conscious or self-aware and can direct the course of the dream. A lucid dream may be quite short, such as perceiving oneself in another room in one's house which is bright as if in full daylight, even though the actual time may be midnight. One can look around the room at one's own will. A lucid dream may end abruptly, with loss of consciousness. Vivid dreams transition only rarely to lucid dreams. A lucid dream is accompanied by a sudden feeling of exhilaration, which a vivid dream does not have. The mind continues to create or add hallucinatory images to both types of dreams.
6. Out of body experiences (OBEs): One may observe one's physical body, lying asleep. OBEs may also occur when under anaesthesia and after brain injury. They can sometimes also be a part of "near death experiences" (NDEs).
7. Inspirational flashes of intuition for problem-solving: In dreams that provide solutions to problems the dreamer has been pondering, we often have the factual report of the images and actions that appeared in the dream which provided answers to previously unsolved challenges. Rarely are there clear indications that the dreamer volitionally directed the dream towards the solution, or in any other way directed other portions of the dream so that the dream could be identified with reasonable certainty as a lucid dream. In many of these cases, however, the person had a strongly held compelling desire to find a solution to a problem prior to entering the dream state. In some cases the quest for an answer had been present for months or even years. The reports of these dreams containing creative solutions were clearly very helpful and even inspirational to the dreamers. In this respect they demonstrate some of the qualities of a lucid dream.
8. Past life memories.

Everyone experiences the first four states, but lucid dreams are very rare unless one takes steps to induce them.

The different states of consciousness listed above can sometimes overlap as mixed experiences. For instance, hypnagogia may involve no imagery, but has been variously described as characterised by visions of half-sleep, 'faces in the dark', 'oneiragogic images,' etc. (Mavromatis, 2010).

An example of a vivid dream transitioning into a lucid dream is given by Celia Green (1968) in her classic book on lucid dreaming. It begins as a vivid dream that turns into a lucid dream. She quotes from Delage (1919):

> I find myself in Paris, on Rue Soufflot, where it meets Boulevard Saint-Michel. I am standing on the pavement, which is on one's right when going towards the Pantheon and I am looking towards the other side of the road, where I see an enormous second-hand bookshop. Long counters stretch along the shop-front under arcades, and there are assistants perched on ladders arranging the books. On the ground between the pillars there are tables loaded with books, and there are passers-by browsing through them and even people sitting to read. I look at this spectacle with a certain surprise, but without remembering in my dream that this is not in accord with reality. I know very well that in that position there is no second-hand bookshop but a large café. But in my dream I do not remember this.
>
> I move away, and a short distance away on the boulevard, between the street corner and the Medici fountain, I join a group of loiterers who are gathered around a contortionist. At this moment I become analytical. I remember coming to Paris the day before, which was a Saturday, and it occurs to me that the next day, Monday, I shall come again to Paris, as usual, for the meeting of the Academy. And from this I conclude that today is a Sunday. Then I say to myself, 'How is it that I came here on a Sunday? This is hardly ever the case.' And at once it

> dawns on me: ' If it is Sunday and I think I am in Paris, I must be dreaming.' The dream immediately becomes completely lucid, without losing any of its hallucinatory character nor any of its vividness.
>
> Thus, the consideration that brought me to the conviction I was dreaming was not the weighty argument that the corner of the Rue Soufflot seems to be occupied by a shop which (in reality, but not in my dream, for the memory does not occur to me) I know very well is not there, but in this very feeble argument I find myself in Paris on a day when I am not usually there.

Celia Green (1968) gives many typical lucid dream examples. She comments it may be hard to classify whether one is experiencing a lucid dream or an OBE. An example is given below.

> Oliver Fox (1968) asked a friend to appear in his room during a dream and reports:
>
> "The following evening we met and I found Elsie very excited and triumphant. 'I did come to you!' she greeted me. 'I really did. I went to sleep willing that I would, and all at once I was there! This morning I knew just how everything was, in your room, but I've been forgetting it all day – it's been slipping away.' She described in detail the following:
>
> (i) Relative positions of door, bed, window, fireplace, wash-stand, chest of drawers, dressing table.
> (ii) The window had some small panes instead of the usual larger ones.
> (iii) That I was lying, eyes open, on the left side of a double bed and seemed dazed.
> (iv) An old-fashioned pin cushion, unusual for a man's room.
> (v) A black Japanese box covered with red raised figures.
> (vi) A leather-covered desk lined with gilt, sunk plate on top for handle to fall back into, standing on the chest of drawers. She described how she was running her fingers along a projection ridge on the front of this desk."

Green adds:

> It is of interest that Fox initially thought that the last of these details was incorrect, and that what the subject had taken for a projecting ridge was merely a gilt line on the leather. However, having asserted that there was no projecting ridge anywhere on his desk, he later discovered that Elsie was correct: Fox noted: "The desk was placed to front the wall, and the hinges (which I had quite forgotten) made a continuous projecting gilt ridge just as she had described. Owing to its position she had naturally mistaken the back of the desk for the front."

Here is another short example from Green, classed as a lucid dream:

> Dreaming that I was walking along a road – straight and I think walled on one side – I realised I was dreaming. I knew this was a thing I had been trying to do and thought, 'Now I can make something happen'. I thought I would like to have an apple. I saw a patch on the road ahead and thought, 'By the time that I reach that, it will be an apple'. Before reaching it, I found I had another apple in my hand. I examined it, thinking, 'Quite a creditable imitation of an apple'.

Lamberton, in a state of hypnagogia at the end of a sleep, had a lucid vision of a blackboard of geometric drawings on it, which solved a problem he had been trying to solve by a different method. This is an example of a vivid vision/dream from which a scientific proof (invention) arose. Another example is that of the mathematician Poincare who invented Fuschian Functions. Probably they were still in a dream-type of mental state as they awoke, or they would not have seen these in a vision/image, for example as a blackboard.

It seems most promising to develop a state which may expand one's faculties in ways that are beyond normal self-consciousness, as an exploratory quest, perhaps even leading to out of the body experiences (OBEs). While associations are sometimes noted between lucid dreams and OBEs, a discussion of the link between these is beyond the scope of this paper and for more on this the reader is referred to Yushak (2009) and Green (1968).

Methods for deliberately entering a lucid dreaming state

Various mind-body methods have been employed to induce a lucid dreaming state.

Non-electronic methods

1. A fast, easy method to achieve lucid dreams is to use a flotation tank (Hutchison, 1984), but may require several sessions. This is typically an 8 ft x 4 ft tank holding 10 inches of nearly saturated solution of magnesium sulphate (BP or USP grade), at 35 degrees C (skin temperature). This creates an ambience where there is no sense of touch. The room is dark and soundproof, so all five senses receive no normal input. This causes the brain to "turn up its automatic gain control", which brings forward normally-subliminal inputs into one's consciousness – a very unusual state to be in. Also, an electroencephalograph (EEG) trace shows that bi-laterally symmetrical beta, alpha and theta brainwaves are spontaneously produced, normally associated with advanced meditation. After less than an hour, spontaneous bright images may appear, like a vivid dream, except that one is fully awake and self-conscious. These may be scenes from long-past memories, or cartoon characters. Several sessions may be needed to reach this state. Some call this a "WILD" (Waking-state Induced Lucid Dream).

A flotation-tank-induced state of consciousness has a wide range of uses, including achieving self-hypnosis for difficult subjects; pain relief (e.g., arthritis) achieved by endorphin release caused by the tank experience; super-leaning for students, used, for example, by lawyers preparing mentally for court case presentations and used by baseball team members before a game; improving athletic performance; reducing smoking and drug use; achieving weight-loss; giving access to the right-brain for creativity and enhancement of inventiveness; reducing stress and anxiety; and it appears beneficial in prevention of heart disease (Hutchison, 1984).

2. A simple method, needing no equipment, is to look at one's hands very frequently throughout the day and try to make them disappear, as a test of whether one is awake or dreaming. If this simple test is made habitual by being done very frequently during the day (which is surprisingly difficult to remember to do!), this will then automatically be continued during dreams but then one's hands will disappear and this will trigger a realisation that one is dreaming, and at that moment of self-consciousness the dream may become lucid. Through this process, one is inviting the left hemisphere to become active during dreaming. The dream can then be consciously directed.

A simpler variant is just to look at one hand frequently during the day and then, when going to sleep, decide to do the same in any dream. This action can trigger a lucid dream.

Another similar daytime exercise is to continually ask if one is dreaming or not by looking away and back again and see if the scene has changed. If it has, you are dreaming.

Other such trigger methods are described in books on lucid dreaming by the Lucidity Institute (LaBerge and Rheingold, 1990; Levitan and LaBerge, 1993).

3. Namkhai Norbu (1992) describes a retreat into a dark room for two or three days, which has been used by western psychologists to produce vivid dreams. But the same production of visual imagery

can be obtained in hours instead of days by using a flotation tank, described in (1) above. See also Appendix C.

Electronic methods

1. The “Dreamlight”® (Lucidity, web reference) utilizes a face mask containing LEDs which flash when dreaming is detected by rapid eye movements (REM). This series of flashes alerts the dreamer, within the dream, that he/she is dreaming, and this can trigger self-awareness. However, wearing a face mask has the disadvantage that it may be hard to sleep while wearing it.

2. A thermistor (a resistor that changes with temperature) is taped to a nostril to monitor breathing rate. Its resistance varies with temperature. One’s in-breaths are colder than out-breaths. One’s breathing frequency increases during dreaming sleep, triggering a frequency meter to send tiny electric shocks to the sleeper’s wrist, or to flashes of a bright strobe lamp. The dreamer perceives the flashes in the dream as part of the dream, and then realises he is dreaming and a lucid dream is thus triggered. People with epilepsy should not use the strobe flashing method because it can precipitate seizures.

3. A simple lucid dreaming method is to make a recording of fifteen minutes of silence, followed by one’s voice saying, “This is a dream. You are dreaming.” If this is played late at night when one is sleepy and seated in an easy chair, one may fall into hypnagogia within fifteen minutes and this may transfer into a lucid dream. A free program called “Audacity” to make this recording, is available from Audacity (web reference) and the recording can be copied to an I-pod or other recording device and listened to with earphones. In addition, earphones may be uncomfortable in bed, but perfectly alright when sitting in an easy chair.

4. Applications ("Apps") are now available on the I-pod Touch and I-phone, which wake one up during rapid eye movement (REM) sleep - the best state for lucid dreams.

a. One App is called "Sleep Cycle Alarm Clock" and is meant to wake you up only during a dream, giving a better wake-up feeling than an ordinary alarm clock, which may wake you in non-dreaming deep sleep and can leave you feeling disgruntled. This App detects dreaming sleep from the fact that one moves position slightly when dreaming, and then it sounds an alarm. Instead of using the programmed audible alarm, which would just wake one up, the output socket on the I-pod Touch can be taken off as in Figure 1 and used as shown in Figures 2 and 3 to trigger lucid dreams. (See further details and explanations in Appendix B, and the Sleep Cycle Alarm Clock display in Figure 5.)

For the Sleep Cycle Alarm Clock, the I-pod Touch can be used to detect REM sleep by using the accelerometer which is built into an I-pod Touch or an I-phone. This allows dreaming to be detected with nothing worn on the face and no sensor connected anywhere on the person while sleeping. Nothing is in contact with the body. This is a very major advantage, as one can sleep quite normally, unencumbered by attached sensors. The author of this article found the system works well for its user. A potential drawback is the use of strobe light flashes, but in this case another person sleeping nearby was not disturbed by the light flashes. (See Appendix B, Figure 2 for the strobe setup.)

b. An alternative to a strobe for the same method is to use a device intended as a “Snore Stopper” which can also be run from an I-pod. The type tested by the author is shown in a separate article (Hocking, web reference). It is worn like a wristwatch and is less convenient than the strobe, because it requires a sensor to be worn. The only advantage of the snore stopper method is that it would not cause epileptic seizures. When the I-pod is triggered by REM sleep, its signal can power either the strobe or the “snore stopper” device. The latter has an electret microphone which is meant to pick up sounds of snoring that persist for more than about 8 seconds, and then it delivers tiny electric shocks to the wrist, which rouses the snorer just enough to make him/her stop snoring, but without waking

him/her up. This has been found to alert a dreaming sleeper sufficiently to become lucid in his/her dream.

Herbal methods for lucid dreams

The author has found that if one eats a vegetarian dish in the evening called Lo Han ("Buddha's delight") with soy sauce, available in some Chinese Restaurants, one may have unusually vivid dreams in that night. The constituents of this dish, listed in Google, include lily buds and soy sauce.

Lily contains galantamine, which is known to cause lucid dreams. Choline or Alpha GPC may enhance this effect. In the author's experience, there are no effects during the day in the normal waking state, so this seems to be a morally acceptable herb/drug in that it is non-addictive and will not alter the user's behaviour in any ways that may affect others.

The extract from plantation-grown Red Spider Lily (*Lycoris radiata*) has a long history as an herbal treatment. For thousands of years people have used it for dream enhancement, as a headache treatment and for its positive effect on memory recall.

An herbal extract from the common snowdrop plant has long been used for improving memory in Eastern Europe. In experiments for the USA Food and Drug Administration (FDA), a synthetic version of this extract known as galantamine improves the memory of those with Alzheimers disease. These studies revealed an odd side effect, namely that those in the study reported significantly more dreams and enhanced dream recall. (See Appendix A for further practical details on the use of Galantamine.)

Other methods

The author has experienced what were undistinguishable from lucid dreams but which also seemed like OBEs, leading me to suggest that the dream state involves some aspect of the astral. On returning from Hawaii to the UK, the author had considerable jet lag and while waking from the first night's sleep back in the UK, the author's bedroom appeared as it is, except that garlands of flowers were hanging on the walls. The field of view was a full 360 degrees, but at the instant of waking, the field of view snapped back to the normal 170 degrees and the garlands vanished.

Sleeping at unusual times has been cited as a method for lucid dream induction, such as getting up at the usual time in the morning and then going back to bed to sleep again (LaBerge & Rheingold, 1980).

The following reports are included on a possible link between OBEs and lucid dreams. On such a link, see also Green (1968) who says lucid dreams are closely related to OBEs and gives many examples, and Yuschak (2009).

Appolonius of Tyana (Hocking, 2011) wrapped wool around himself to obtain out-of-the-body experiences (OBEs), which possibly relates to one of the flotation tank features of making the environment temperature equal to the skin temperature. A flotation tank (Hocking, 2011) can produce spontaneous "WILDs" (wake induced lucid dreams) but this is beyond the scope of this paper.

It is also reported that wrapping oneself up completely like an Egyptian mummy, also causes out-of-the-body experiences.

Ashcroft-Nowicki (1980s) recommends that we might use the following exercise: Imagine an old wooden door, with massive hinges (which will appear – depending on the depth of one's degree of visualisation). Through the doorway you see a wild moorland on one side and on the other side a set of cliffs, washed by a grey wind-swept sea. You exit and lock the door behind you, placing the key in your pocket. A detailed "pathworking" journey follows. Ancient archetypal paths can be used, defined

by scenes on Tarot cards (for example, Tarot trump card XXI is an "astral doorway" – a path between Malkuth (Earth) and Yesod ("Astral") in Kabbalistic terms (Z'ev ben Shimon Halevi [Warren Kenton], 1979). After such journeys, return through the door and lock it behind you. It is important to ensure that you are fully back in your own space and time (Hocking, 1993). Surprising revelations from your subconscious may be obtained by this method. *See also last para. of Conclusions (after Chapter 11).*

See also references (Hocking, 1993; and Hocking, web reference) for more information on brain hemisphere activity, EEG usage, biofeedback, light and sound devices, cranial electrical stimulators, Ganzfeld, pathworking, and flotation tanks and for a free download of related information by the author.

Inspirations during dream states of various sorts

An indication that a hypnagogic state (which is the precursor of the full sleep state) can yield valuable applied results is evidenced by a procedure used by Thomas Edison, who was an incredibly prolific inventor. He used to relax in an easy chair while holding a rubber ball in his hand, and dozed towards sleep. Falling asleep caused him to release the ball, which then fell onto a metal sheet on the floor that caused a noise sufficient to jar his consciousness enough for him to bring into his waking state many ideas for inventions. I would speculate that Edison's method may have led him into the theta brainwave dream-state which has many possibilities for creative consciousness. Cade and Coxhead (1989), using the Mind Mirror EEG (web reference), found that theta brainwaves increased in amplitude in the hypnagogic and dreaming states. Theta brainwaves (about 6 Hz) are associated with dreaming and meditative states, and are produced by experienced meditators but are absent in the normal waking state. Edison developed over a thousand inventions that were patented, many of which he obtained by his above special hypnagogic relaxation method, which he had devised for that purpose.

It is not known if Edison's hypnagogic reveries came only as ideas or as dream imagery, but many others report distinct imagery during hypnagogic states, which generated important literary and scientific contributions. Of note is Coleridge's "Kubla Khan"; in writing this, Coleridge experienced a daydream in which 'all the images rose up as things' (Koestler, 1981).

Poems, ideas for novels and entire novels have arisen in hypnagogic states (Mavromatis, 2010). Emily Bronte describes hypnagoic imagery in writing Wuthering Heights and Villette (Mavromatis, 2010). Charles Dickens derived many of his stories during hypnagogia, but it is not known if this generated ideas only, or imagery (Mavromatis, 2010). The author F. Miller (1906) describes in detail how a novel arose, with her eyes closed, from imagery involving the Incas (Mavromatis, 2010).

Jean Cocteau, on waking, visualised a play, as if he were watching it in a theatre, which he later published as "The Knights of the Round Table" (Mavromatis, 2010). Mavromatis gives many other such examples of dreaming, sometimes lucid dreaming, of material useful for various purposes. Other examples are given by Green & Green (1977), but too detailed to summarise here.

Probably the best-known example of a dream-state which yielded valuable scientific information was that of the organic chemist, Friedrich Kekule, who reported, "I fell into a reverie, and lo!, the atoms were gambolling before my eyes … I saw how, frequently, two smaller atoms united to form a pair, how a larger one embraced two smaller ones … I saw the larger ones form a chain … I spent part of the night putting on paper the sketches of these dream forms." Kekule had a series of such visions, the most famous one being on the ring structure of benzene. He did not 'direct' the dream, nor use the term 'lucid dreaming.'

Numerous other examples are given by Celia Green (1968) in her classic book on lucid dreaming.

A wide variety of examples demonstrate the broad spectrum of dreaming and inspirational mental states, particularly in the spectrum of vivid and lucid dreaming. If one considers that there are other zones of consciousness besides our normal three dimensional world and our ordinary conscious state, it seems worthwhile expanding our own consciousness to include these. Such exploration would increase one's inner knowledge.

Acknowledgement

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Books & forthcoming books by the author on related topics:
"The purpose of Life - Why are we here?" (free full-text downloadable Google e-book).

"Remote Viewing observations of atoms & quarks" (free full-text downloadable Google e-book).

For a free download of more information related to the topic of the present paper see:
www.4-D.org.uk/Books

APPENDIX A: Resources

Yuschak (2009) has published research papers and a book on galantamine, which is essential reading on this topic. He covers use of herbal supplements (which, unlike narcotic drugs, do not alter one's waking behaviour) to produce immediate lucid dreams and out of body experiences (OBEs), including seamless transition from waking awareness to induced lucid dreamstate consciousness ('WILD'). Herbal supplements are also discussed by Hocking (2011).

Internet links on galantamine:
Memeron (galantamine compound website): www.memeron.com
Razadyne (manufacturer's website): www.razadyne.com
Galantamine (patient information): www.meds-help.com/galantamine/

Useful websites on galantamine:
http://dreamstudies.org
http://dreamstudies.org/galantamine-review-lucid-dreaming-pill/
http://www.dreamviews.com

Internet suppliers of galantamine include:
www.smartnutrition.info/brain.html#Galantamine
www.dreamamins.com
Vitamin Express, who call it Galantamind: www.life-enhancement.com
See "Galantamine" in Wikipedia for more information.
Note: These are herbal products and so have no purity standard such as BP or USP. The author cannot recommend their use. The above details are given for information only. If preferred, natural lily buds as an ingredient of 'Buddha's Delight' (see in Wikipedia) can be bought from a Chinese food store, or ordered in a Chinese Restaurant as a dish called 'Buddha's Delight'.

In addition to www.saltcube.com and www.lucidology.net, another useful website is http://www.twoweekluciddreamer.com but the writer (MGH) has not tested this.

APPENDIX B: Instructions for I-pod device to trigger lucid dreams

This appendix explains the simple electronics for those who wish to put together a practical I-pod device for triggering lucid dreams.

The required application programme ("App") is called "Sleep Cycle Alarm Clock" (v. 3.0.1) (Maciek Drejak Labs AB, 2010), and is available from the
I-Tunes on-line shop (Health & Fitness section) for only £0.69 or US$1.00.

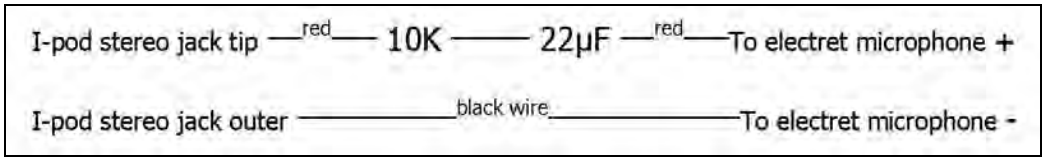
The App allows a "song" of one's own to be inserted and used as the wake-up alarm, which is played by the App only when REM dreaming is detected, within a 45 minute window immediately before a chosen wake-up time. To trigger the audio switch, 3 claps at about half-second intervals are recommended by the audio switch manufacturer, but it was more reliable to make up one's own recording with 3 sounds (not claps), half a second apart, such as**:**"pah, pah, pah", spoken staccato and very loud, which the I-pod voice recorder will record. A recording is available from the writer if there is difficulty with this. This recording has never failed to trigger the audio switch.

When using this, set the volume (when in the App programme) to maximum.

The aim is to convert the "song" output from the I-pod's App, into a signal that will switch on a strobe light at a settable flash frequency for a (settable) time interval of about 10 seconds, after which the circuit will switch the strobe off and lock out any further strobe activations.

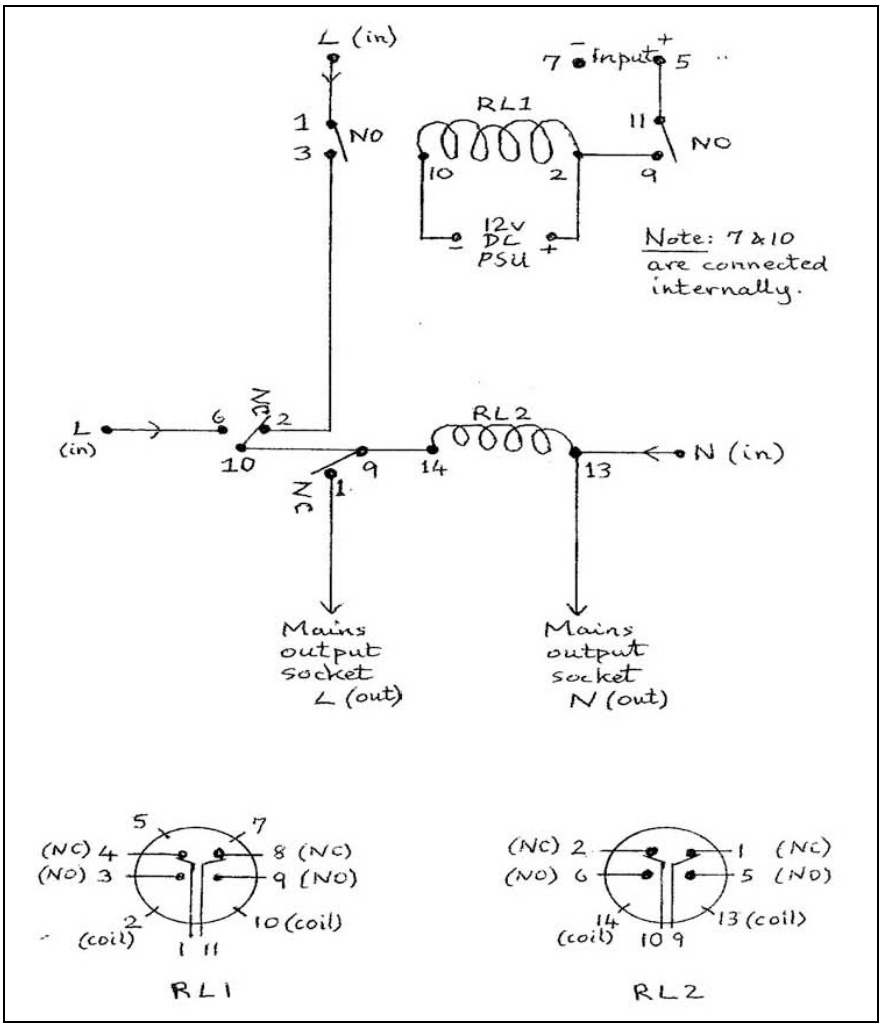
The audio output socket on the I-pod was used (see Figure 1) to activate the relays in the circuit of Figure 2.

Figure 1. Connection from I-pod to electret microphone in audio switch



Notes: Observe polarity! This is a 2 metre twin wire from the I-pod stereo jack socket, to the electret microphone in the audio switch shown in Figure 3.
This is the only item in this paper that needs soldering.
The 22µF electrolytic capacitor has its negative end connected to the 10K quarter-watt resistor and its function is to block the low DC voltage which exists across the electret microphone terminals. (Electret microphones have about 3 volts DC across their terminals, to work.)

Figure 2. Relay circuit



Notes: This setup uses two relays: RL1 is RS Type 348-245, a high sensitivity type with a 12 volt DC input into pins 5 & 7, which switches the relay RL1 contacts.
RL1 has a 12 volt DC coil (pins 2 & 10), powered by a second 12 volt DC output PSU, which was plugged into the mains socket strip (see Figure 6). NB: Correct DC polarities are observed for both of the PSUs. See Figure 6 for block diagram of all connections.
The first 12 volt DC PSU (observe correct polarity) is plugged into the output socket of the audio switch, and when it is switched on, it sends a 12 volt DC signal to the input pins (5 & 7) of RL1 which activates the Figure 2 circuit, which powers the strobe for the time period set on the time delay relay RL2. NC = 'normally closed' and NO = 'normally open'. 'Normally' = with power off.

RL2 is RS Type 340-617 time delay relay with a 240 volt AC coil. RL2 pins 13 & 14 are its mains 240 volts AC coil, and the other pins are self-explanatory from the diagram. The base for RL2 is RS 493-6341. This schematic of Figure 2 shows the base to be round, but it is oblong in fact.

For 115 volts AC mains, equivalent components are available. An Earth (Ground) connection is needed (not shown) – see caption of Figure 6.

Figure 3. Audio Switch (examples from eBay international sellers).

Notes: The 230 or 240 volt version is for UK use.
Some models are triggered by 3 claps (or staccato noises), but others require only 2 claps. Neither will work with the wrong number of claps.
The audio switch early versions had a reputation for overheating and starting to smoke! This was probably because high wattage appliances were plugged into them, but the small transformer used in this application takes an extremely low power. Nevertheless, the author did not leave the audio switch powered if no-one was in the room.

Safety:

We live in an increasingly litigious age. The author stresses that everything throughout this paper must be taken as an account of what the author did (even if it may appear otherwise from the local text in the articles) and cannot be used as the basis for any claim against the author, that is the author does not intend the articles in this document to be a suggestion for anyone else to copy what he did. For instance, if an author writes an article on bungee jumping, then he cannot be sued if someone copies what he did and then claims to have been injured. (Note: Never try bungee jumping – the deceleration can detach your retinas!)

(1) The circuit design (Figure 2) of this unit uses relays to keep it simple by needing only a screwdriver. But if a user has any doubt about safety, advice from a qualified electrician should be sought or the assembly job done by a qualified electrician.

(2) There should be no electrical hazard from the I-pod, as it is meant to be usable while connected to its mains charger, but as an extra essential safeguard, the 4-outlet mains strip which powers everything was plugged into an RCD (residual current detector) safety switch, which are commonly used for electric lawnmower safety.

This also allowed everything to be turned on and off together by just pressing the red test button on the RCD. A block diagram of all the interconnections is in Figure 6.

The mains output socket (to power the strobe light) must have a surge protector plugged into it, because RL2 switch contacts are rated at 3 A resistive load, and could be damaged if an inductive load is switched. The system was not left on all day (because the time delay relay coil would remain “on”). To prevent this, everything was always switched off after waking, hopefully after a lucid dream.

(3) Any electric blanket was switched off.

(4) A non-electrical safety aspect is possible stroboscopic effects on people with epilepsy, including as-yet un-diagnosed epilepsy. This requires the author to say that no-one with a history of epilepsy,

seizure dysfunction, or psychiatric or neurological disorders, should use flashing lights without taking medical advice from a qualified practitioner. But the strobe is only on for about 10 seconds and when the user is expected to be asleep. **Caution:** See the very last page (188) of this e-book.

IMPORTANT: If the author happened to be awake when the strobe light flashed, he kept his eyes closed – as it is important not to look directly at powerful flashing lights. Never look at a strobe with eyes open.

Note: A baby's eyes can be damaged by photoflash lights – never use a strobe in their presence, and never take photoflash camera pictures of babies.

Instructions used:
The "App" Alarm was set to a time about 30 minutes before normal waking-up time. It would then respond to the REM sleep periods which are likely to occur within the 45 minutes before this set time.

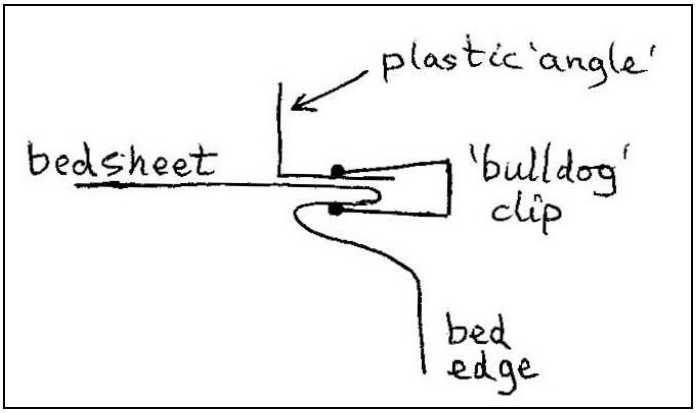
The time delay relay (RL2) was set at first to 6 seconds, but if this did not trigger a lucid dream, this delay time was increased. But if it woke the user up, instead of triggering a lucid dream, the delay time was decreased. The delay time is the time for which the strobe is powered on. The strobe was set to an (optimum) flash frequency (Levitan & LaBerge, 1993) between 2 and 4 flashes per second; this can also be varied (at the strobe unit).

Useful reading: references (LaBerge & Rheingold, 1990) and (Levitan & LaBerge, 1993).

To stop the I-pod falling off the corner of the bed, the best method is to use a "bulldog" clip as in Figure 4 to secure the plastic angle.

The relay switch contacts are wired such that further trigger signals (if any occur) are locked out (so that no further unwanted strobe activations occur).

Figure 4. Method of preventing I-pod from falling off the bed-edge

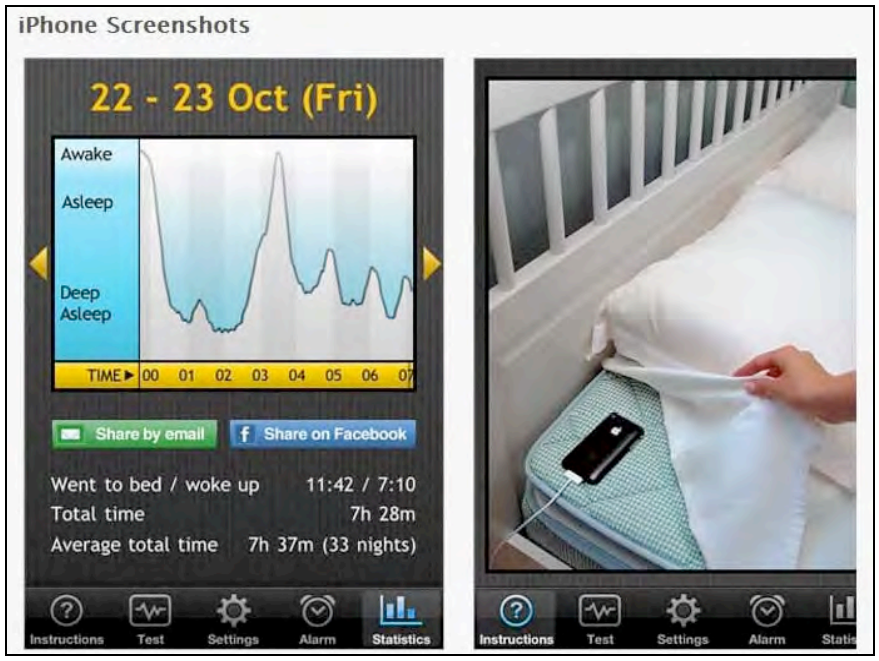


Place the I-pod face down where the words “bedsheet” are written in this figure.

The plastic angle (from DIY shops) is about 1 inch x 1 inch x 6 inch. Round off the upper corners to avoid being scratched by it.

The bulldog clip stops the angle from slipping. Use two clips, spaced apart.

Figure 5. I-pod Touch, or I-phone, in use with the Sleep Cycle Alarm Clock APP



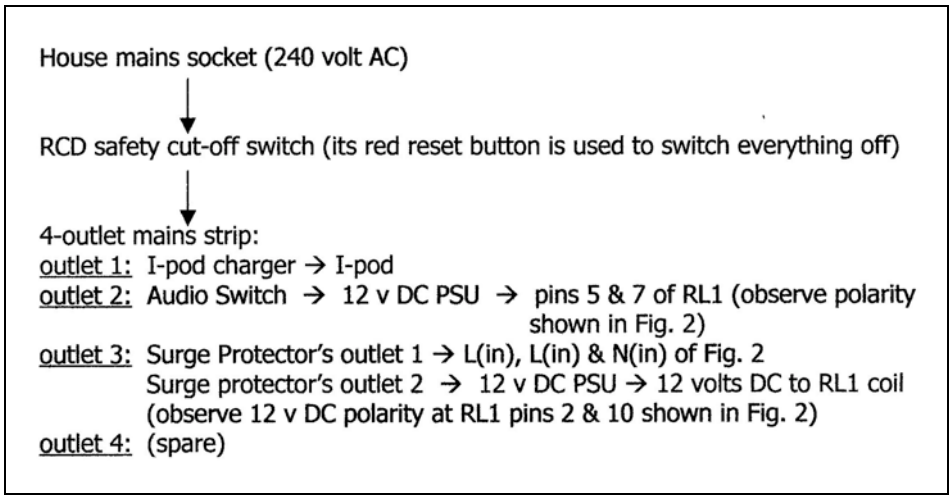
IMPORTANT: The I-pod as is wrongly shown about to be covered in Figure 5! It will overheat: see text on this point. (The APP will probably not work with Tempur® mattresses which are very compliant to body contours, but a piece of hardboard could be tried, under the pillow and extending under the I-pod.)

Website: http://itunes.apple.com/gb/app/sleep-cycle-alarm-clock/id320606217?mt=8&ls=1
Cost of the "App" is £0.69

NOTE: Airplane Mode must be set, to avoid unhealthy radiation from aerial all through the night when asleep!

REM (light sleep) periods are peaks on the graph. When sleeping, small body movements are made only in REM sleep periods and are then detected. The slightest movement of the I-Pod Touch activates its internal detector (accelerometer), which then sounds music as an alarm to wake you up. But instead of waking one with music, three sharp sounds can be used to trigger an audio switch which triggers a strobe light. This alerts one within the dream. One then becomes aware that one is dreaming and one's dream-state changes to lucid.

Figure 6. "Block diagram" of all connections for the strobe method



PSU = Power Supply Unit (mains to 12 volts DC output).

RCD = Residual Current Detector safety switch.

Important: The mains supply has 3 wires: Live (L), Neutral (N) and Earth or Ground (not shown). The Earth (Ground) connection is essential for the safety RCD to work.

Outlet 3 has a surge protector adapter plugged into it, with 2 outlet sockets on it.

The strobe was plugged into the output socket of Figure 2 ("Mains output socket" in Figure 2), and that output socket must have a surge protector plugged into it.

Circuit Notes:

Figure 2: Two points marked L (in): Connection for 240 volt AC mains power input from the RCD via a surge protector (e.g. RS 209-112). See Figure 6.

Figure 2: One point marked N (in): Connection for mains neutral power input from the RCD (via surge protector as above).

Figure 2 "Mains output socket" L (out) & N (out): These wires connect to a single mains output socket, containing (another) surge protector into which the strobe (or other device) plugs in, and so becomes powered by the relay circuit shown above.

Figure 2 "Input": This is for a 12 volt DC input from a 12 volt DC PSU plugged into an audio switch, which triggers the relays in circuit of Figure 2, to activate the strobe for a fixed time interval set by the time delay relay, RL2.

"NO" means these relay contacts are "**N**ormally **O**pen" and they close only of the relay coil is energised.

"NC" means these relay contacts are "**N**ormally **C**losed" and they open only when the relay coil is energised. Both relay switches are "double throw" types, DPDT (double pole double throw). DP means there are two separate sets of switch contacts.

Note that pins 7 & 10 of RL1 are connected together internally (not shown on above diagram).

Figure 2 “PSU”: is a +12 volt DC power supply unit, of the commonly available type which powers many small electronic appliances. It is plugged into the same 240 volt mains power supply strip that powers the above Figure 2 circuit and its +12 volt output is connected to pins 2 & 10 of RL1 (coil). It is on, for all of the time that the mains supply to the relays is on.

Note that there are two separate +12 volt DC power supply units: one is plugged into the audio switch, and another which is connected to pins 5 & 7 of RL1.

A detailed technical explanation of the relay switching logic is given on the author’s website, with other information: www.4-D.org.uk/Books and click on UPDATE for a free download.

A suitable strobe is the 45 watt Maplin LG38R, which is £30 and mains powered. It was placed on some furniture near the bed. A cheaper (£18) strobe (Maplin N97JB) should suffice if placed only 2 feet away.

Testing:
After recording the “song” (pah, pah, pah) in an I-pod or I-phone, it was loaded into the Sleep Cycle Alarm Clock App, which allows one’s own “song” to be used instead of the list they provide. For testing purposes, this “song” (3 loud “pah” sounds, to trigger the audio switch) can also be played outside of the App by just selecting it from the playlist or wherever it is stored in the I-pod.

Or, instead of using the I-pod, the user simply says 3 loud “pah” sounds into the audio switch direct (it has an internal microphone) and watches its 3 LEDs light up in sequence, and this should flash the strobe and it should stop flashing after the set delay time has elapsed.

Or, just tap the side of the audio switch 3 times at half-second intervals.

There are 3 LED lights on the audio switch (Figure 3) and each light should illuminate on each of the 3 “pah” sounds. Only if all 3 LEDs light up, will the audio switch be triggered. This is to reject spurious sounds.

If the audio switch is triggered, the LED light on the mains to 12 volt DC adapter which is plugged into it, will light. This adapter activates the first relay, RL1 in Figure2. Relay 1’s coil is powered by a separate 12 volt DC adapter.

Parts List:
RL1 is RS part no 348-245, @ £20, and base 342-569, @ £3.
Web reference: http://docs-europe.electrocomponents.com/webdocs/10ea/0900766b810ea7bb.pdf
RL2 is a time delay relay such as RS type part no 340-617, and base RS 493-6341.
Web reference: http://docs-europe.electrocomponents.com/webdocs/002b/0900766b8002b957.pdf
These are from RS Components UK (see internet catalogue).

Two surge protectors are required, e.g. RS part no 209-112, which is also a 3-way 13 amp plug adapter, convenient to plug into. Alternatively, a similar device which contains a varistor (rated at 360 volts) can be used. See Figure 6.

PSU (Power supply unit): AC-to-DC type, e.g. from Maplin, P/N L82BF. This type has a rather bright LED showing it is on. Some other types have a dimmer LED, but some indicator lamp is desirable to easily show if it is on or off. **Two** such regulated PSUs are needed, each giving 12 volts DC output. A low current output is needed, so no need for a high current model.

STROBE: Maplin LG38R, 45 watt, 240 volt AC, which is £30; or N97JB (£18).
AUDIO SWITCH: See Figure 3.

APPENDIX C

The so-called “Dream Yogis” of Tibet report the ability of maintaining continuous unbroken consciousness, day and night. Namkhai Norbu (1992) suggests visualisation of a letter A on a blackboard before sleeping and again on waking, and other methods for lucid dream induction. Tenzin Wangyal Rinpoche (1998) provides a similar approach, too detailed to summarise here. Lama Surya Das (2000) has produced an audio course on achieving lucid dreaming which is a worthwhile approach.

Michael Gwyn Hocking is a Professor of Materials Chemistry, University of London. He has published 150 scientific papers, and a major reference book on metallic and ceramic protective coatings. Books on topics relevant to the present paper are in the References list above.

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Chapter A (ii): New Rapid Method for obtaining Visual Images

Instant images, with eyes closed, can be obtained by inducing simultaneous brain states of wide-awakeness (Beta waves) **plus** deep sleep (Delta waves), but with wide-awake consciousness. The method described below produces very clear stable images, not just abstract geometrical patterns generated perhaps** within the brain, but natural images like trees with branches blowing in the wind, which are **vivid**, sharp, and **highly stereoscopic**.

This works even if only **blackness** is normally seen with eyes closed, and it gives immediate entry to advanced meditation. It could thus be of great value as a preliminary to meditation. The alternative, is years of conventional meditation practice, and even then, one may never achieve imagery.

Different flashing light frequencies into the left & right eyes, are known to produce imagery, but they are too blocked out by the distracting flashing. The new feature described below, is to switch off the beta frequency flashes into one eye, **after** about 10 minutes of beta & theta flashes into both eyes. Half the field of view is then flash-free, and the whole field only flickers like an old silent movie. This greatly reduces the swamping-out of imagery by the flashes, and greatly increases the strength of the visions, and also makes them very easy to maintain (stable).

The visions/imagery are somehow behind the flashes and the flashes can weaken, and even disappear from view, due to habituation. Extraneous thoughts do not disrupt the visions: simple mental arithmetic can be done. The subject can then pass on to advanced Buddhist or other forms of meditation.

The effect of flashing light, produced by the spokes of a wheel interrupting sunlight (to **closed** eyes) was known at the time of the Ptolemies in Egypt. The use was described of the spokes of a wheel, spinning, which interrupted sunlight reaching the closed eyes of a meditator. Definite trade links between Egypt and India in that era means that this method is very likely to have been known in India at the time of the Buddha, but has been lost there down the millennia to the present time. The method described

** (Footnote): Some reports say such patterns are also seen without strobe lights.

below is just a technologically-assisted way of doing the same thing, and is enhanced by blocking one eye as described above.

Although relaxation and clearing thought from the mind are essential for entering this state, when the state has been achieved, it is then possible to think while in this unusual mind-state. This intuitive creative state can be of interest for inventors, as well as for those interested in meditation.

Fig. 2 to 4 show brainwaves at various stages of conventional meditation:

Fig. 2 to 4. *Electroencephalographs of brainwave states:*

The left-hand lines are graphs of the left brain hemisphere's electrical activity, with frequency plotted vertically ↑;
the amplitude is plotted horizontally, increasing to the left ← .

The right-hand lines are graphs of the right brain hemisphere,
with amplitude increasing to the right → .

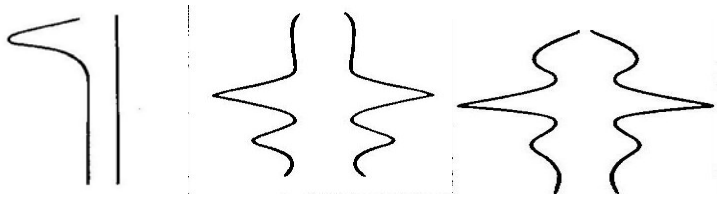

Fig. 2. Fig. 3. Fig. 4.

Fig. 2. The untrained mind.
This is the "linear logical calculating" brain function, of an average person.
The logical calculating left brain hemisphere is active.
Artistic people also show a similar peak in their right brain.
The β (beta) peak at, 18 Hz, indicates the normal, average, waking state.

Fig. 3. Traditional meditation: **α** & **θ** peaks.
*The beta peak of Fig. 2 above has nearly gone, & large symmetrical **α** & θ peaks in both left & right brain hemispheres occur at about 10 & 6 Hz, respectively.*

Fig. 4. Illumination – an advanced type of meditation: **β, α** & **θ** peaks.
*A small beta peak at 18 Hz, above the alpha at 10 Hz, indicates 'wakefulness', but unlike Fig. 2 (the normal waking state), there are also alpha (**α**) & theta (θ) peaks at about 10 & 6 Hz, and all are symmetrical (in both left & right brains).*

The main text starts on the next page:

Induction of dream-state visual imagery while awake 33

M. G. Hocking

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ABSTRACT

Rapid entry to a state of vivid visual imagery, starting from the normal waking state, is reproducibly obtained using a modified stroboscopic method. The modification removes most of the distracting flashing and allows imagery to be perceived even by those who normally see only blackness when closing their eyes. This approach is complementary to the use of 40 Hz tACS on dreaming sleeping subjects, which can trigger lucid dreams. Mechanisms are suggested. The method is relevant both to meditation **and** to develop the inventive intuition ability needed to enhance technolgical invention.

INTRODUCTION

Voss et al [1] report that when sinusoidal 40 Hz transcranial alternating current stimulation (tACS) is applied to the brain, lucid dreams are reported, for a subject who is asleep and in a normal dreaming state. I.e. the subject moves from the status of a **conscious** but passive observer (the normal dream-state), to that of a **self-conscious** participator in the dream (a 'lucid dreamer').

The new method reported here, approaches from the opposite direction, i.e. with a subject (with eyes closed) who is wide awake, and who then has a deep sleep brainwave state added to his existing wide awake brain-state, both states then being simultaneous. This method produces immediate vivid imagery, in the wide-awake state, even for those who normally can only see blackness when closing their eyes. **Important:** See Warning on last page (page 188).

IMPORTANCE

Many dreams are products of the imagination and other subjective factors. But semi-lucid dreams which solved actual problems in the objective world, were used by Edison to bring forward inventions from his subconscious into his conscious mind. Edison wrote over 1000 patents, and the subject of dream enhancement is of great technological importance. Edison's dream method is described in Appendix 1.

Dreams are often misleadingly bizarre because the left brain is the logical filter which normally removes bizarre ideas which arise in our right brain, the intuitive inventive side. But when asleep, this left-brain logic filter is almost inactive, and so bizarre dreams can result.

RELATION TO STROBOSCOPIC LIGHTS

Different simultaneous flashing light frequencies into the left & right eyes, while awake, have long been known to produce images/visions, although usually too swamped-out by the distractingly strong flashing. In the research reported here, both eyes start with flashes at 10 Hz and then, by ramping, one eye receives flashes ramped during 9 minutes to 18 Hz (beta frequency), while the other eye is ramped simultaneously to 6 Hz (theta frequency). EEG

measurements then showed very large peaks at 38 Hz (even though the ramp target was 18 Hz), and, also, at 1.5 Hz (even though the target was 6 Hz). The 18 Hz flashes are then switched off, which reduces the distracting flashing to an acceptable level. The 6 Hz flashes maintain the special state of vivid imagery.

INTERPRETATION

This 38 Hz (gamma frequency) produced, is at the same maximum lucid dreaming effect frequency of 40 Hz reported by Voss et al [1]. REM dreaming sleep has a brain-wave frequency of about 6 Hz (theta), and deep sleep has 1.5 Hz (delta). The dreaming subjects used by Voss et al [1] were already in a theta and/or delta state, and were conscious of dreaming, but not self-conscious (lucid) because they had negligible beta or gamma (beta is the normal self-conscious brain-state). They just needed some beta or gamma frequency to make them self-conscious, which Voss et al then added, by using a tACS device. The significance of this is that 40 Hz indicates a wide awake brain-state, and so this, when added to their dream state, caused self-consciousness (a lucid dream began). This interpretation assumes that the 40 Hz is causal.

This compares with the method reported below, which is to produce visual images starting from a wide awake state, in which the subject already has beta and gamma activity, and just needs sleep theta and/or delta activity to produce the imagery characteristic of the dream state. The result is comparable to a lucid dream-state. I.e. the method reported here approaches the result of Voss et al [1], but starting from a wide awake state, instead of from the dream-state of Voss et al's subjects. The two methods are somewhat complementary.

METHOD

The new feature of this study, described below, is to switch off the beta frequency flashes to the left eye (or right eye) after (essential) beta and theta flashing into both eyes. Half the field of view is then almost flash-free, and the whole field only flickers like an old silent movie. This greatly increases the strength of the images, and also makes it much easier to maintain them, even allowing extraneous thoughts not to disrupt them: simple mental arithmetic can be done without losing the images. The images are not just abstract patterns produced in the brain by a stroboscopic effect, but are natural images such as trees blowing in the wind, vivid, coloured and highly stereoscopic. These images are somehow 'behind' the flashes, which weaken and even disappear due to habituation, when the flashing is limited into only one eye. The images are very reproducible, on different days.

Spectrum Analyser EEG graphs of the final state (discussed later) show a very high (off-scale) left-hemisphere peak and a medium high right-hemisphere peak, both at 38 Hz (gamma). At 1.5 Hz there was a large left hemisphere delta peak, when the final flashing (6 Hz) was only into the right eye.
It may be significant that the 6 Hz flashing frequency is a harmonic of 1.5 Hz.

Further research is needed on the effect of changing the ramp target frequencies to the actually measured final EEG frequencies produced, of 38 Hz and 1.5 Hz, instead of the notional target frequencies used (18 Hz and 6 Hz), but it may make little difference if the brain settles naturally into its preferred final frequencies of 38 Hz and 1.5 Hz. See ref. [40].

FLASHING PROGRAMME USED

It is essential to first entrain the left & right brain hemisphere frequencies to 18 and 6 Hz target frequencies, before blocking off the 18 Hz flashes from one eye (left or right), leaving only the 6 Hz theta frequency active into the other eye (right or left). **Caution**: See DISCLAIMER on page 4, & see p. 188. Important: both eyes must be kept closed throughout.

This method is explained in Fig. 1.2 below, assuming it will be the 18 Hz beta flashes to the left eye which will be stopped:

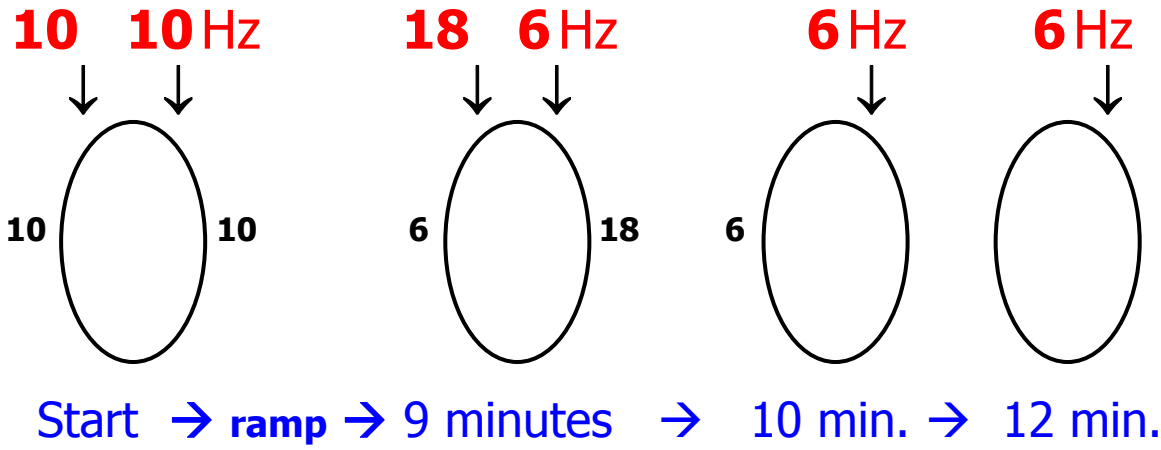


Fig. 1.2 Top view of head. Ears not shown. Frequencies in Hz.
Light flashes in **bold** type, sound tones in normal type:
Start: **10** Hz flashes to both L & R eyes, and 10 Hz tones to L & R ears.
The ovals are top views or "plan views" of the head, at the times shown.
Ramp (automatic) to reach **18** Hz (Beta) flashes to L eye, & 18 Hz sound tones to R ear, and, **6** Hz (Theta) to R eye & L ear, at 9 minutes. (No need for user to measure 9 minutes as it is obvious from the lights & sounds that they have become constant after 9 minutes).
Remove right earphone (18 Hz, Beta) at 10 minutes.
Rotate **left** potentiometer to zero to stop flashes to **left** eye (18 Hz, Beta) at 10 or 11 minutes.
Remove left earphone (6 Hz, Theta) at 12 minutes.
{Optional Experiments: After about another 2 minutes, very slowly reduce the R brightness. After a further 5 minutes, reduce right brightness further, but if the vision is lost, increase it. Later, raising to maximum brightness will produce more-vivid images.}
Hold for 30 to 50 minutes (optional session length).
Important: Eyes MUST be kept closed at all times, (for safety reasons).
Important: Appendix 7 gives "Troubleshooting" in operating the above programme.
Appendix 6 gives essential instructions on using an MP3 audio player, and especially **Appendix 3**, page 74 gives other important essential instructions that the author used.
Caution: See the very last page of this e-book.

Flashes and sounds are partly crossed-over within the brain, to the hemispheres in a way described in [2], but the above instructions can be reversed (in a new session) to send the 18 Hz flashes to the other eye, also of course changing over the left & right sound inputs, to give an improved result

after a week's use of the first version. This alternation of the active eye is advantageous.

The normal effect of Light & Sound (L&S) devices is to artificially create brainwave patterns of the types shown in Fig. 3 & 4, but the specific programme described in this article quickly creates a brain-wave state with gamma plus delta. Fig. 3 & 4 types of pattern may take many months or even years of traditional (unaided) meditation practice to achieve, with no L&S device. Fig. 3 & 4 can also be achieved fairly quickly, using biofeedback, monitored by a spectrum analyser EEG device such as the 'Mind Mirror' [3]. Simultaneous monitoring or biofeedback using an EEG, is not required for the simple method described here.

The programme described below should rapidly produce visual images, in just one or two sessions, on separate days, even if previously one normally can see only blackness when trying to visualise anything.

RESULTS

The results below describe what the author experienced, but if other researchers consider using this method, the safety section at the end of this chapter, headed: ***"CAUTION if using Light & Sound devices"*** *must* be read. This chapter is not a *recommendation* to use this method and no responsibility can be accepted for any adverse effects. For legal reasons, the author reports the method below in a "first person" narrative style ("I"), and not as a set of instructions to others. It is what I did, where "I" is the author. **Caution:** See the very last page (188) of this e-book.

I normally see only blackness when I close my eyes, and I cannot visualise.

- I sat in a comfortable easy chair, so as not to be distracted by bodily discomfort.
- Room was in total darkness (important). A grey or lighter background reduces the essential contrast of the images, to an unusable state.
- It was 6 am, on winter mornings, when I usually had no distracting thoughts.
- I used the simple Schultz relaxation method [4] first, if I sometimes had problems relaxing.
- If I relaxed and cleared all thoughts [5] from my mind before starting, then after about 15 minutes into this 30 minute programme of **Fig. 1.2**, I began to see objects, e.g. trees, 'behind' the flashing lights.
- As the brain habituates itself to the flashing, the flashing almost disappears.
- After 15 minutes I saw a scene which had only a slight flicker superimposed on it (like an old silent-era movie), or even no flicker at all.

Important: Both eyes **must be** kept closed at all times.

- If the mind wanders onto irrelevant thoughts, this can prevent any images for the whole half-hour session! This rarely happened.
- I blocked out extraneous thoughts if necessary, by mentally repeating "one, one, one …" or any other monosyllable. Those with a Christian background can try 'mentally hearing' music (music only, with no voices singing) of a bright yet devotional hymn like "Angels from the Realms of Glory", which the author finds surprisingly effective in excluding unwanted thoughts and in

pushing the residual flashing into the far background. Any devotional music from any other religion would be suitable and this is **not** an attempt by the author to "push" Christianity.
• I did this exercise daily, in the early morning, before my mind began thinking about other things.
• It is passive, very easy to do, and not at all boring, due to the visual light-show input instead of the boring blackness which discourages many people from conventional meditation-type exercises.
• Total darkness of the room is essential, or use black cloth over the lamp glasses.

The programme used, reaches and settles at its target of theta and beta frequencies after 9 minutes (Fig. 1.2).

• Then, if I relaxed and became "disinterested", I may see at first many small dark grey irregular shapes, hardly flickering, in a slightly lighter grey background, which may then become like an irregular ancient grey stone wall, and then dark deciduous leafless trees or other scenes appear, very stereoscopic, slowly moving past me, i.e. as if I am walking past static trees in a forest.
• I showed no interest in them, or they would vanish and be replaced by the flashing lights.
• But relaxing and clearing thoughts from the mind produced the trees again within a minute, and the flashing faded again into the background.

Often, the trees etc did not appear until the 18 Hz flashes to the left eye were faded to off, but I still proceeded with the final steps (of fading out the 18 Hz flashes to the left eye &c), and the trees always then appeared, within a minute.

• If the trees were already (faintly) visible before the flashing to the left eye was faded to off, then at fully faded-off, the trees suddenly became very much denser and with thicker branches, moving past me, quite a marked effect. It was **very** astonishing indeed, as I had never before seen any visual imagery, but only blackness, with my eyes closed.

• The trees are initially as if seen just before dawn, all grey and dark, with no colour, like in real life when the eyes lose their colour sensitivity in low light conditions, a well-known property of the eye's retina light receptors.
• They look more like 'ghosts of trees', than actual trees, completely without movement, and very detailed, and highly stereoscopic. Others report different scenes, such as a hillside with skiers on it.
• After a week or more of practice, I could move easily in and out of seeing the trees, during a session, by thinking extraneous thoughts, which made the trees disappear and be replaced by the flashing lights. But then clearing my mind of all thoughts, made the trees re-appear within a minute.
• The trees were most definitely not just an image of blood vessels in the eye.

As it was early morning, I had no natural tendency to go to sleep, as a possible consequence of this deltawave-inducing method. The trees were very stereoscopic, and obviously the physical eyes were not involved because the left eye flashes were switched off (2 eyes are needed for stereoscopic vision).

As soon as the left eye flashes were switched off, this image was very much more stable, and much easier to maintain than all previous ones, and was an impressive result.

Finally, after about 12 minutes from the start, when I removed the left earphone (6 Hz), the trees gained a light purple blossom, and soon some much lighter green-leafed trees appeared, interspersed with the other dark grey trees. From Maxwell Cade's "inherent feedback" observation [4], **purple** indicates **theta waves,** and **green** indicates **beta waves**. The purple may also indicate delta waves (not mentioned by Cade, but seen in my EEG trace Fig. 6).

A wind sometimes occurred later, blowing the branch ends vigorously – the first movement ever seen, up to then, of local parts of the trees. The whole field of view could also be made to be stationary by imagining it to slow down to a stop. For these enhanced results, a relaxed state is essential.
Very different degrees of success may be obtained on different days, depending greatly on one's relaxation state and if extraneous thoughts occur and recur. If such thoughts are a problem, then first practice avoidance of extraneous thoughts by the simple exercises given by Mouni Sadhu, in his book, "Concentration" [5], e.g. look at the second hand of a watch, until it can be done for 5 minutes without extraneous thoughts arising. This exercise may take several weeks to achieve for some people.

Possibilities for modifying the visual images include the following observations: I found that the views became lighter, and with thinned-out spacing of trees and more gusts of wind blowing them, if uplifting thoughts are entertained. These can be of a simple verbal nature, or, from an external source.

I found that the views became lighter, had thinned-out spacing of trees, and more gusts of wind blowing them, if the following were recited: (Note: If I were an atheist, I would suspend my disbelief at this stage, and resume it after the exercise!): *The love of God be with us, always.*
(Or anything which gives exalted feelings).

NOTE: Infrasound creates devotional thoughts, and, because both ears are free, the possible playing of infrasound or near-infrasound may be effective (not yet tested sufficiently). Suggestion: Play CD [6, 35].
E.g. measurable biochemical effects are produced by infrasound and near-infrasound low frequencies. Low sound frequencies echoing from monastery walls alter one's state of consciousness, and cause brain biochemical effects -- hence the chanting of monks, especially Tibetan chants at very low frequency. Recordings of these are available, to be heard with eyes closed for optimum effect [6, 35]. Some large cathedrals resonate at infrasonic frequencies produced by infrasonic organ pipes, which are too long to produce audio-range sound, which were specifically designed, centuries ago, to enhance devotional effects: instead of you meditating, these effects 'meditate' you.

As both ears are open after 12 minutes (see Fig. 1.2), such infrasound can then optionally be played to enhance the images, if an infrasonic sub-woofer audio system is available (suitable audio driver: Velleman kit K8060, 3 Hz to 200 kHz).

The vision of trees &c is only the beginning – one must slowly thin out the trees, and create other visions of one's own choosing – likely to be a long process, but this method is a valuable starting point for pathworking etc [36, 37, 12], and for advanced meditation: See last para on page 16, & see Chapter 9 and especially the last para. of Conclusions (after Chapter 11). Much further effort and time is needed to convert these 'instant' images into mystical experiences, for those who wish to explore that avenue. A Mantra audio CD is available [41].

Some traditional meditation books advise against being (what they call) "sidetracked" by phenomena during meditation, but the author disagrees with this advice, because if a vision of anything is seen, instead of just blackness, that gives a **very** valuable starting point of entry, which offers the chance of changing it into a mystical experience. Visions/imagery obtained by this fast method are also a great encouragement to continue meditation practice, especially for a beginner.

After some weeks of practice, if the mind is cleared, and if not concentrating on the trees, other visions eventually occurred almost spontaneously, e.g. a wall and a house, and later an aerial view of a town with distant people moving in the streets.

Note: the more time the brain spends in this special beta + delta state, by any method, then the more likely it is to achieve it at other times, **without** using a light & sound (L&S) device.

The Sheehan Visualisation Scale (imagery):

Perfectly clear & vivid like actual experience:	**1**
Very clear, comparably vivid like actual exp.:	**2**
Moderately clear & vivid :	**3**
Not clear or vivid but recognisable :	**4**
Vague & dim :	**5**
So vague & dim as to be hardly recognisable:	**6**
No image at all, only thinking of the object :	**7**

Table 1. The Sheehan Visualisation Scale.

Note: Without this Light & Sound device method, trying to visualise trees, the author's result is only grade **7** on the above Sheehan Scale: No images at all, always just blackness!

Comment on frequent spontaneous visions of trees: Dante [39] says,
"I found myself within a forest dark … I cannot well repeat how I entered,
So full was I of slumber at the moment … .
But still we were passing onward through the forest, the forest, say I, of
thick crowded ghosts." Et passim.
A line from a famous poem by William Blake: "… in the forest of the night …"

ELECTROENCEPHALOGRAPH (EEG) STUDIES

Spectrum analyzer EEG graphs of meditative brainwave states are shown in Fig. 2 to 4 below, using a spectrum analyzer EEG biofeedback conventional method [4]:

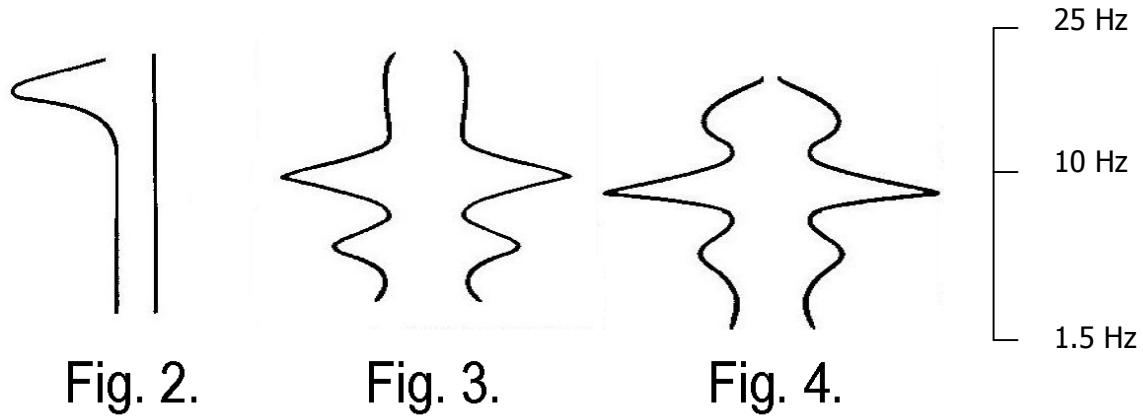


Fig. 2. Fig. 3. Fig. 4.

Figs. 2 - 4. Spectrum Analyser Electroencephalographs of brainwave states [4].

The left-hand lines in each figure are graphs of the left brain hemisphere's electrical activity, with the frequency spectrum plotted vertically ↑ from 1.5 to 25 Hz; the amplitude is plotted horizontally, increasing to the left ← .

The right-hand lines in each figure are graphs of the right brain hemisphere, with amplitude increasing to the right → .

Fig. 2. The untrained mind.
This is the "linear logical calculating" brain function, of an average person.
The logical calculating left brain hemisphere is active.
Artistic people also show a similar peak in their right brain.
The β (beta) peak at, 18 Hz, indicates the normal, average, waking state.

Fig. 3. Traditional meditation: α & θ peaks.
The beta peak of Fig. 2 above has nearly gone, & large symmetrical α & θ peaks in both left & right brain hemispheres occur at about 10 & 6 Hz, respectively.

Fig. 4. Illumination – an advanced type of meditation: β, α & θ peaks.
A small beta peak at 18 Hz, above the alpha at 10 Hz, indicates 'wakefulness', but unlike Fig. 2 (a common waking state), there are also alpha (α) & theta (θ) peaks at about 10 & 6 Hz, and all are symmetrical (in both left & right brains).

SPECTRUM ANALYSER EEG MEASUREMENTS

A Mind Mirror II spectrum analyser type electroencephalograph [3, 4] was used to find the brainwave frequencies during an image of moving trees observed during use of a commercial "D.A.V.I.D. Paradise" (DP) Light & Sound (L&S) device [7]. The DP programme used gave, on first use (after the target frequencies were ramped down to), a very clear 3-D image of moving trees about 2 minutes after the ramp-down frequencies had been reached (at 9 minutes). The image quality was grade **1 or 2** on the Sheehan Visualisation Scale (Table 1, above).

The author's own design L&S device shown in Fig. 5, gave the same images. This type of research can be done with such low-cost equipment, and so could be suitable for projects, **subject to** the safety caution given in this paper. The cost of components is only about £25. **Important:** See Warning on last page (page 188).

Without the L&S device method, if the author tries to visualise trees, the result is only grade **7** on the Sheehan Scale: The author normally sees only blackness with eyes closed, due perhaps many years spent on research and writing scientific papers and calculations, all involving only the left brain. Right brain activity, such as art, is needed to produce visions/imagery.

Fig. 5 (a) Flasher Circuit:

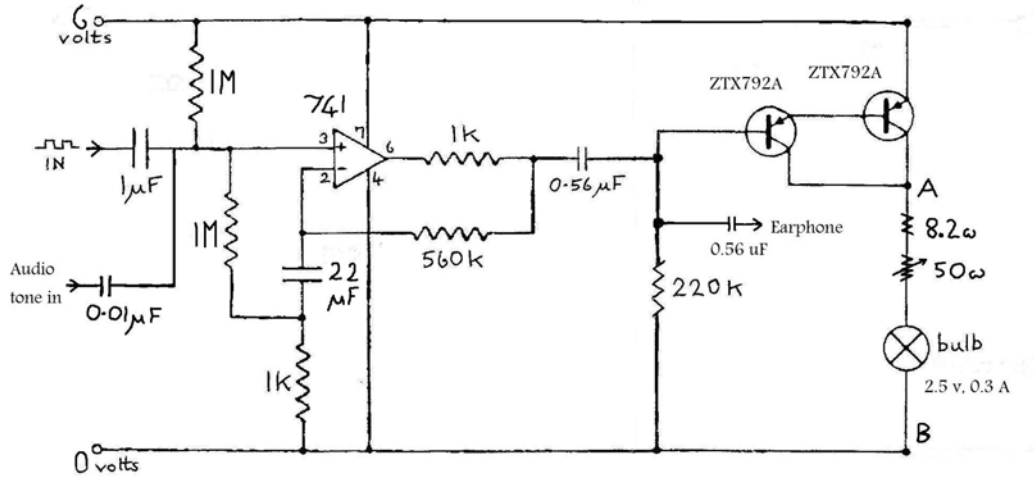


Fig. 5 (b) Audio Oscillator:

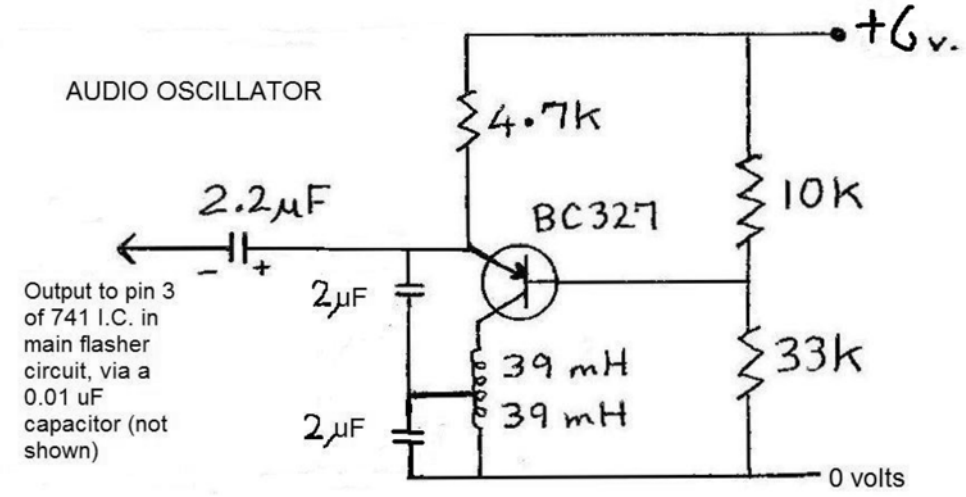


Fig. 5 (a) & (b). Author's Light & Sound device circuit design.
Two flasher circuits are needed, for each left and right lamp, or group of left and right lamps, but only one audio oscillator. Transistors are ZTX792A.
Each flasher circuit will drive several "lilliput" LES bulbs.
The circuit board layout diagram is given in Fig. 9 in Appendix 2. See also Appendix 3.

Notes: The same +6 volts 800 mA power supply unit is used for all circuits. The above information is minimal, and more-detailed instructions are given in Appendices 2 & 3 below, essential to see for full details of the method, including low-cost DIY circuits, printed circuit board layout diagrams, parts lists, and the lamp bulbs used. Caution: See the very last page of this e-book.

For the EEG measurements, when the trees' image stabilised, at 6 Hz, the EEG "hold" button was pressed, to freeze and record the display on the Mind Mirror EEG.

Fig. 6 gives the EEG results, using a Fig. 1.2 process.

There is a very high (off-scale) left-hemisphere peak and a medium high right-hemisphere peak at **38 Hz** (gamma frequency range).
At **1.5 Hz** there is a large left hemisphere delta peak.
It may be significant that the 6 Hz flashing frequency is a harmonic of 1.5 Hz.

Further tests are needed, such as the effect of ramping down to 1.5 Hz (delta) to the right eye, instead of to 6 Hz. The actually measured final EEG frequencies of 38 Hz and 1.5 Hz, instead of the notional target frequencies used (18 Hz and 6 Hz), but it may make little difference if the brain settles naturally into its preferred final frequencies. Voss et al [1] found that only 25 Hz (high beta) and 40 Hz (gamma) caused lucid dreams, indicating that beta or gamma are essential.

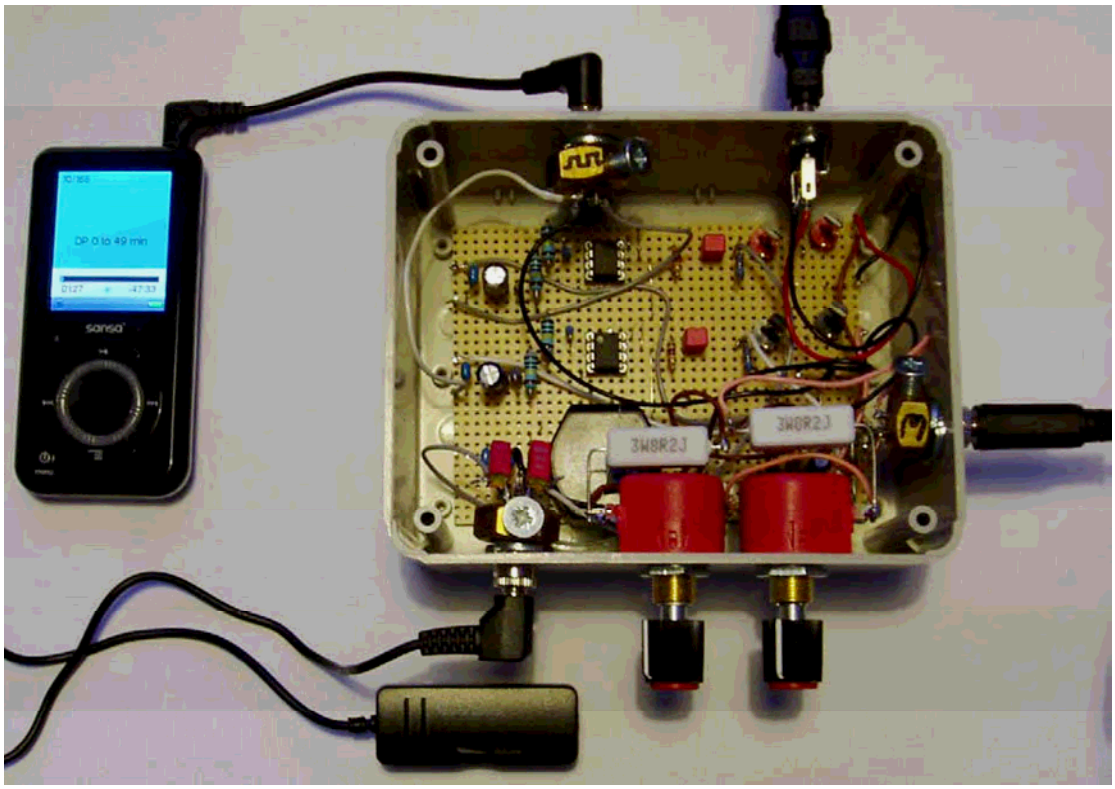


Fig. 7. Light & Sound Device. ((Note: Fig. 6 is below Fig. 7))
All parts were conveniently assembled in a plastic box.
The printed circuit board has the left and right identical flasher bulb circuits on the top 10 and next 10 copper tracks, and the single audio circuit on the remaining 10 lower tracks. Lower left: for earphones, with volume control.

The two (red) 50 ohm potentiometers control the left & right bulb brightness.
Grey 3 watt resistors (8.2 ohm) are seen above each potentiometer.
The "power in" socket on the top right is shown with a plug in it, from the 6 volt DC power supply unit.

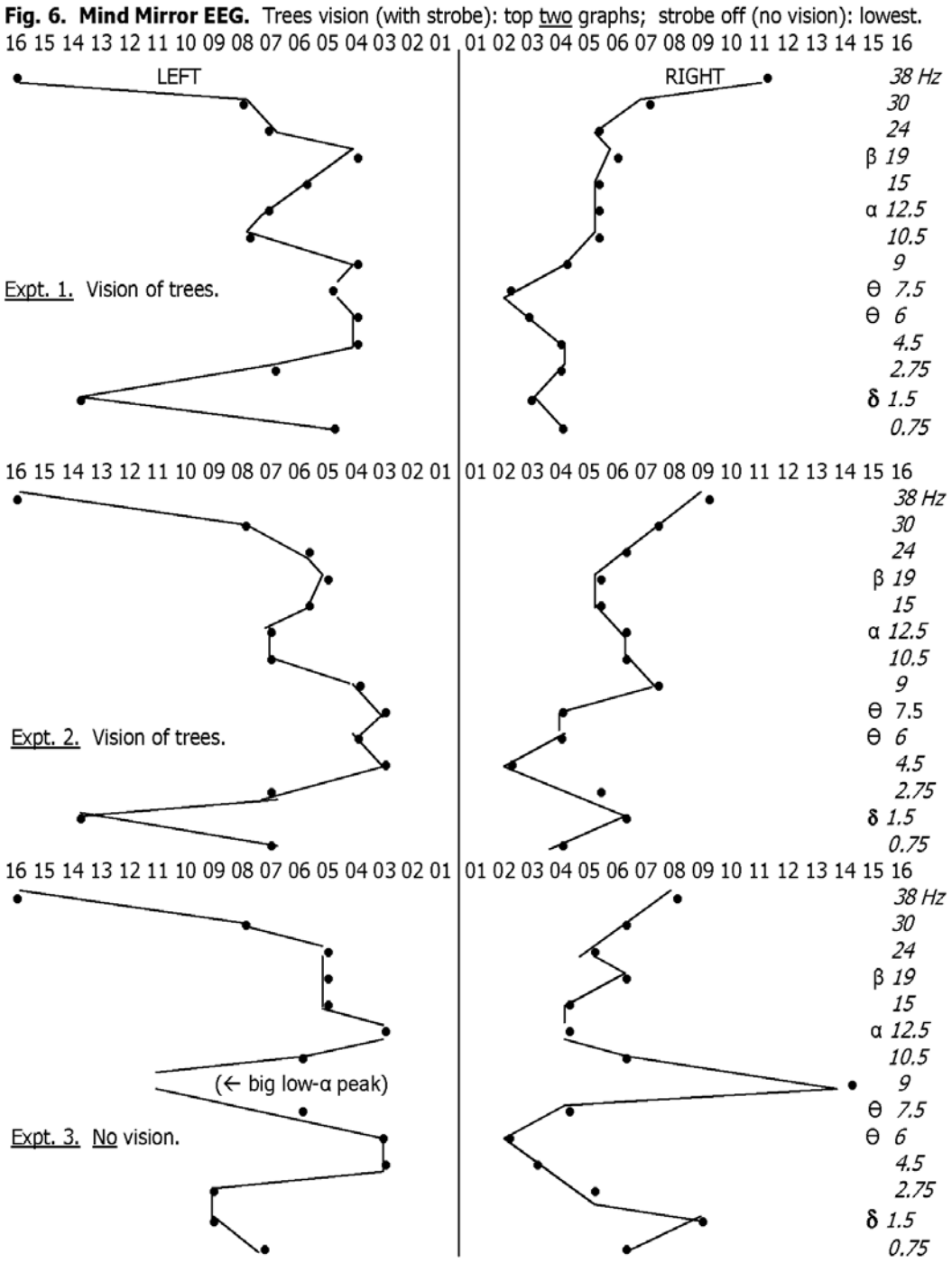


Fig. 6. The 16-01-01-16 scales are the 16 LEDs of the EEG display [3], and the *italics figures are frequencies* in Hz:
LED means a "light-emitting diode", an indicator lamp whose lateral position from screen centre line = signal amplitude at that frequency.
The left half of the screen is for the left brain hemisphere, and the right half is for the right hemisphere.
The Mind Mirror spectrum analyser EEG graphs below were recorded at its maximum sensitivity of 3 microvolts full scale, i.e. LED No 16 lights up at 3 μV (0.000003 volts).
The scale is linear: LED 1 is zero volts and LED 16 is 3 μV.
Experiments 1 & 2 are to indicate reproducibility. Experiment 3, for comparison, was just after thinking extraneous thoughts to destroy the image (no image seen).

GLASSES (SPECTACLES) USED

Modified plastic reading glasses were used for the first tests [8]. But improved images, due to spreading out the illuminated area field of view, were obtained using 4 "lilliput" bulbs for each eye (Fig. 8), in a square array (of 1.6 cm side), sandwiched between two pieces of very thin paper or thin (0.4 mm) translucent plastic sheet for diffusion of the light. The sheet was secured close to the lamps, with as small a gap as possible, to best spread out the illuminated field. The miniature bulbs were in "lilliput" LED lamp sockets, conveniently secured to the plastic lenses with cable ties through drilled holes (Fig. 8). The improvement in the imagery obtained is due to spreading the flashing over a wider field of view:

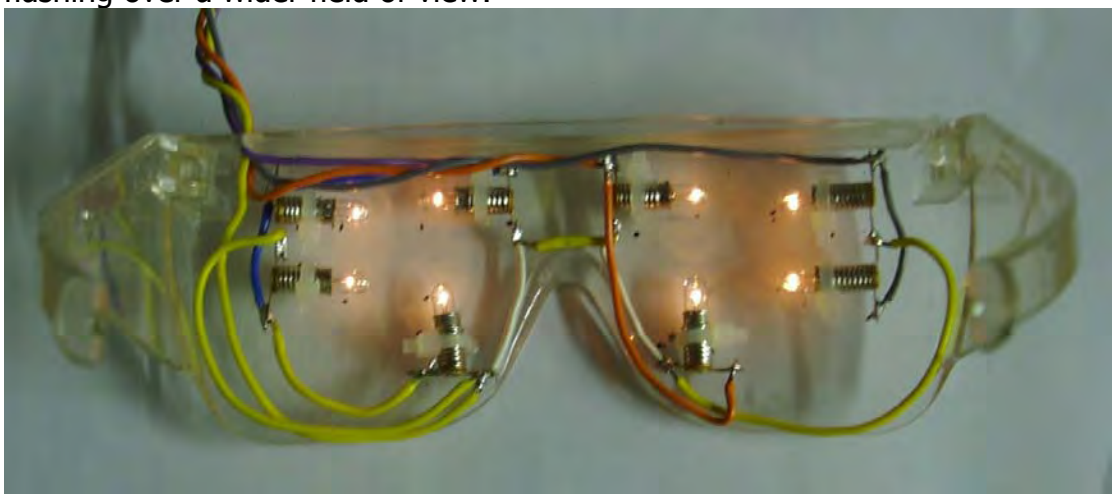


Fig. 8. Spectacles with 4 + 4 "lilliput" (LES) 6 volt 60 mA lamp bulbs. These are fitted in plastic "safety glasses"; the right side-piece is clearly visible on the extreme right. The type was selected to have an almost flat-front large area lenses. See text above.

Important: Four LES "pygmy" torch bulbs are used over each eye (6v, 60mA), sandwiched between two pieces of thin paper for diffusion of the light. Eyes **must** be kept closed during use. Each set of 4 bulbs are in a square array (of 1.6 cm side), sandwiched between two pieces of very thin paper or thin (0.4 mm) translucent plastic sheet for diffusion of the light, which greatly improves results. The sheet is secured close to the lamps, with as small a gap as possible, to best spread out the illuminated field. The miniature bulbs are in "lilliput" LES lamp sockets, conveniently secured to the plastic lenses with cable ties through drilled holes. Further essential details are given in Appendices 2 & 3 below.

The room must be totally dark (e.g. very early winter mornings) **or**, black cloth must be fitted over the front of the lamp spectacles to ensure that the background is as black as possible. A grey or lighter background reduces the essential contrast of the images to an unusable state.

Siever [9] reports that a problem with whole eye stimulation systems is that they do not account for the distinct visual fields that exist in each eye:
The left visual field of both eyes activates the right brain, and, the right visual field of both eyes activates the left brain [2].

This suggests that lamp bulbs are be best placed so that four bulbs are over each eye, arranged such that the 2 left-most bulbs over the right eye can be switched off, to stop flashes from the right eye from activating the left brain. But results indicate best results are obtained by instead switching off the two right-most bulbs over the right eye, after about 15 minutes (see in scheme below). See essential details of switches (in wires to glasses) & pictures of glasses in Appendices 2 & 3 below.

SQUARE WAVES FOR LIGHT & SOUND DEVICE

A square wave generator is needed as the input to the main flasher circuit board, which after amplification sends flashes to the bulbs.
A computer was used to generate the ramped frequency paths, which are as used by commercial L&S devices. A download audio generating programme with ramps was obtained from www.nch.com.au/Tonegen and "Audacity" was used to combine the ramps: http://audacity.sourceforge.net

It is not necessary to have a computer available while using the flashing lights unit, because the square-wave output (ramped) of the computer's USB Audio Device can be copied into any small recording device as an MP3 file: Fig. 7 shows a small Sansa MP3 player, on left of main L&S unit.
Important: See Appendix 6 for an alternative low cost MP3 player procedure.

NOTE: The above information is minimal, and a parts list, and essential detailed instructions are in Appendices 2 & 3 of this free Google Ebook by the author, which includes oscilloscope pictures of the square waves produced. Please report any problems to the author. See Appendix 7 for "Troubleshooting".

FURTHER DISCUSSION

The author is investigating an alternative to flashing lamp bulbs, using two electrodes on the inion and vertex [1, 10], because such electrical stimuli produce phosphenes [10, 11].
Voss et al [1] report that when sinusoidal 40 Hz transcranial alternating current stimulation (tACS) is applied to the brain (via inion & vertex), lucid dreams are reported, sometimes bizarre, for a subject who is asleep and in a normal dreaming state. I.e. the subject moves from the status of a *conscious but passive* observer (the normal dreamstate), to that of a *self-conscious participator* in the dream (a 'lucid dreamer').

The left brain is the logical filter which normally removes anything bizarre which arises in our right brain, when awake. Nothing bizarre was seen by the author, probably because the starting brain-state was the normal wide-awake state, the opposite direction from that which Voss et al [1] started from. Voss et al started from a REM dreaming sleep state and their subjects were awoken after only 5 to 10 seconds after tACS gamma stimulation at 40 Hz. But in a flotation tank, in which one starts from wide-awake, bizarre images are seen [12].
Visual imagery in a flotation tank is far more inconvenient to use than the L&S method described here. In this L&S method, the author was fully conscious (felt "wide awake"), unlike when deeply relaxed and imagining a scene (a very rare occurrence for the author), and the highly stereoscopic vision (e.g. trees) felt like the author was actually present "there", somewhere.

The author's visions of trees were quite unlike any ever seen in actual walks in woods, and were not from any memories. The initial procession of trees across the field of view could be modified; it was more like a view into another dimension, into which a window had suddenly opened. See also the comment above on Dante.

Also, the author has tried ramping the right eye down to 3 Hz, and this changed the images of trees seen at 6 Hz, to grey-stone buildings in village streets, no trees. But unlike the easily recoverable stable images of trees seen at 6 Hz, the images of buildings seen at a 3 Hz final frequency were difficult or impossible to recover, if lost due to adventitious extraneous thoughts.

It is necessary to have simultaneous gamma or beta, and, theta or delta, linked with some alpha activity, to be in this unusual brain state. This type of research is very important, because, for example, Einstein and Edison were able to function with normal waking awareness while being *simultaneously* in a dream-type state, allowing insights into many important scientific and technological problems. See Appendix 1.

Other methods for entering visionary states are available [30] and a new method devised by the author for **lucid dreaming** requiring no sensor at all in contact with the sleeper [30].

FUTURE RESEARCH

Siever [9] reports that a problem with whole-eye stimulation systems is that they do not account for the distinct visual fields that exist in each eye: The left visual field of both eyes activates the right brain, and, the right visual field of both eyes activates the left brain [2].

This observation suggests that lamp bulbs may be best placed so that (at least) two bulbs are over each eye, arranged such that the leftmost bulb(s) over the right eye can be blocked out, to stop flashes from the right eye from activating the left brain. But early results indicate best results are obtained by instead switching off the two right-most bulbs over the right eye.

The final flashing into one eye is **far less distracting** than if into both eyes, but the possibility is being investigated of **further reduction** by just applying the final 6 Hz **only as electrical impulses** to electrodes at the inion and vertex (reported [10,11] to produce phosphenes). For this, electrodes are connected to points A & B in Fig. 5a via a potentiometer and a simple amplifier (e.g. Velleman 7W mono audio amplifier module, VM114, 20 Hz to 20 kHz, or better, Velleman K8060, 3 Hz to 200 kHz), adjusting the potentiometer upwards from zero for safety. Phosphenes and magnetic effects have been reported in many papers by Cohen Kadosh et al [11].

The visions of trees &c had no flicker, so they were not dependent on any optical persistence of vision -- the lamp flashes at only 6 per second, which is well below that used and needed for cine/film projectors.

Important: In case the pineal gland is being activated to produce DMT by by flashing lights (see "Mechanisms" section below), a possible optimum flashing frequency should be investigated by stepwise reducing the final 6 Hz.

MECHANISM

Evolutionary natural selection has developed the 5 primary senses to warn animals and man about events in their immediate vicinity, which might affect their survival. E.g. hearing, to detect a snapping twig in a forest; vision, to detect an enemy, etc. But if these senses are all suppressed, e.g. by deep relaxation, or dreaming sleep, or in a flotation tank [12], then much weaker subliminal secondary senses' inputs may become perceivable, and, may be enhanceable by psychoactive compounds.

Events beyond the immediate vicinity, are less of a threat and thus secondary, and less developed, and if the author may be allowed to hypothesise, if they exist they should have a biological basis -- an organ to sense them. For subliminal (secondary) vision, this could be the pineal gland, which produces serotonin and melatonin, tryptamines, which are a class to which several naturally-occurring psychoactive compounds belong, such as psilocybin and DMT (N,N-dimethyl-tryptamine). Melatonin is a pre-cursor of DMT with a very similar molecular structure, and is produced by the pineal gland in dark conditions. Psychoactive compounds have been used in attempts to enhance creativity, by opening perception to subliminal areas [13], rather like Edison's drug-free method (see Appendix 1). A link between vision/imagery and the pineal gland is that nerves from the eyes connect (circuitously) to the pineal, and light regulates seratonin and melatonin production by the pineal, instantly suppressing its melatonin release if absent. See caption of Fig. B.2 in Chapter B.

Strassman [14] (84 references) has suggested that DMT is produced by the pineal gland at times of special stress and other specific times. Enzymes which convert seratonin and melatonin into psychoactive compounds are present in the pineal gland, as methyltransferases, which can di-methylate tryptamine to create DMT. Another example is the production of betacarbolines by the pineal, which act with DMT [14] to produce the same powerful psychoactive *ayahuasca* as occurs naturally in *Psychotria viridis* and *Banisteriopsis caapi* [15] (360 references).

DMT produced by the pineal would cause unwanted overwhelming visionary effects which would be dangerous especially in daylight, and its precursor melatonin is suppressed by light to protect the individual [14]. Excessive stress can overcome this protection, as can psychosis, allowing (unwanted) DMT production. Dreams occur around 3 am when metatonin levels are highest, which suggests a link with DMT and betacarbolines [14, 16].

Meditation may also affect production of psychoactive compounds by the pineal gland, and the EEG patterns in Fig. 3, 4 & 6 in the present paper likewise. The devotional effect, mentioned earlier, of infrasound on the pineal, if any, has not been studied, nor has the effect of flashing lights.

Questions are raised about whether electronic techniques can be applied to meditation.

.

Footnote: Cortisol, dopamine & serotonin levels increase during simple use of a colouring book!

E.g. it can be said that the "God helmet" [32] can "generate so called spiritual experiences", but, it could instead be said that the God helmet "can put the brain's receptors into a state in which they perceive what are normally un-perceived subliminal inputs". This is a very topical subject, as many neurologists today are trying to show that all religious experiences can be explained as being simply physically generated by brain neurological activity.

Persinger [32] developed a method using low intensity magnetic fields at 1/50 of the Earth's magnetic field, but alternating at low frequency (Cf. Fig. 2 - 4), to induce a dissociation effect. It seems as if another person is present, but it could be a higher aspect of one's self, which is normally not perceived. The effect is reported by some as being in the presence of God or an exalted being [32]. A book "The Third Man" [33] describes this unusual effect, which is also encountered by mountaineers under extreme conditions, including anoxia which causes CO_2 narcosis, putting the brain into a receptive state for subliminal inputs (visions). The breathing exercises of yoga also increase CO_2 (narcotic) levels, producing the same effect, as discussed above. Very high currrent magnetic methods are at the other extreme, producing savant-like effects [34].

The vision of trees described above may be that the L&S activates or opens the so-called "third eye" or eyebrow chakra [38, 12]; books by Dante ["The Divine Comedy" - Dante's Inferno, etc] report many visions of trees [39]. The present author saw nothing which was in any way threatening or sinister!
Important: "Stop Press" item added: see on page 83, just before Appendix 5.

Safety Note: To avoid leaving the user in a dreamy state, for safety, any user of any L&S unit should add a ramp up to a higher flashing rate **after** the session end [7], to exit from the low frequency brain-state, – any frequency ramp programme can be created using a computer as explained in Appendix 2 & 3.

DISCLAIMER
The author can take no responsibility for any effects produced by the above methods. This paper is a description of what the author did, not a recommendation for anyone to use flashing light systems and professional advice must be sought if in doubt. ***See page 188 of this e-book.***

CAUTION IF USING LIGHT & SOUND DEVICES
The items described are experimental consciousness-enhancing products, for which no medical claims are made or implied. Diagrams in Fig. 5 & 7 are freely given, but without warranty. **Important:** See Warning on last page (page 188).

Light & sound and CES units should not be used by persons with a history of epilepsy or other neurological disorders, but, for information only, from Maxwell Cade & Coxhead [4]**:** *"After 4 years use of the lights, with more than 4000 pupils including 25 known epileptics, there have been no mishaps, and most of the epileptics have reported a marked improvement in their condition. ... subjects were only exposed to the lights after they had become very relaxed..."* (see page 49 *loc cit* [4] for more details). This is quoted for information only and the best advice is that medical advice should be obtained before proceeding in such cases. See Fig. 6.1 for Maxwell Cade's workshop.

Note: To avoid leaving the user in a dreamy state, for safety, any user of any L&S unit should add a ramp up to a higher (beta) flashing rate after the session end, to exit from the low frequency brain-state, – any frequency ramp programme can be created using a computer as mentioned above.

Additionally, it is essential to allow at least half an hour after using light and sound devices and other mind-enhancing units and tapes before operating machinery or driving a car. Dangerous accidents could occur and so the author cannot recommend use of any equipment mentioned, nor accept any responsibility for any adverse effects. No responsibility is accepted for any use of light & sound machines or devices, nor if any of the above information is used. **See additional cautions at end of Appendix 3, and on page 188.**

Flashing LEDs and flashing xenon lamps, MUST be viewed ONLY through **closed** eyelids, NEVER with eyes open. LEDs have a small laser effect, harmful if the eyes are open. Bright MES and LES filament lamp bulbs very close to the eyes could be a hazard if the eyes are kept open.

APPENDIX 1: EDISON'S METHOD

The inventor, Edison, used to relax in a chair with a metal sheet on the floor and a rubber ball in his hand over it; relaxation produces the alpha state and the deeper intuitive theta state, but this usually causes loss of beta, which means that one falls asleep. Edison prevented this happening because the ball then fell from his hand onto the metal sheet, which woke him up just enough to maintain some activity in beta, alpha and theta, and he was then able to bring his inventions in this special state, from theta into his aware mind, beta. Fig. 3 & 4 show beta linked via alpha to theta, necessary for images and ideas in theta to be brought into the normal waking consciousness of beta.

APPENDIX 2: Layout diagram for a printed circuit board for circuit of Fig 5.

See further more detailed information in **Appendix 3**.

Fig. 9 (a & b) are views of the top (component side) of the printed circuit board. To obtain a view from the underside of the board, the figure can be put into any graphics programme with an option to create a "mirror image" view.

A printed circuit board with 30 rows of parallel copper tracks is used.

The top 20 tracks are used for the left & right channels, and the lower 10 tracks are used for the audio oscillator circuit.

Only the top 10 tracks are shown in Fig. 9a, 1 to 10. Tracks 10 to 19 are identical to tracks 1 to 10, with track 10 being the positive 6 volt DC power input track, just like track 1.

So the emitter of T4 is on Track 10, but in the layout diagram below, only a 6 volt connection to track 10 is shown. The other connections must be added as in track 1 above it.

The zero volts track 16 must be connected to track 7.
An 800 mA (minimum) mains adapter with 5, 6, and 7.5 volts DC outputs is preferred. The 7.5 volts can be used, optionally, for brighter flashing, but 5 or ***6 volts*** *is preferred.*
Note: A silicon diode is shown on the layout circuit, intended to prevent damage in case the DC power supply unit is connected with reverse polarity by mistake.
An **X** indicates that a copper track is cut at that point.

9a: Flasher circuit layout diagram (below):
For the left flasher circuit, **A** & **B** connect to (not shown) a 50 ohm potentiometer in series with an 8 ohm resistor and a torch/flashlight bulb(s) fixed to the left spectacle lens. Similarly for the right flasher circuit.
A 3.5 mm stereo socket is used to connect to the left and right lamp bulbs.
C is connected via a 0.56 µF or 0.68 µF capacitor to a 3.5 mm stereo socket for the earphones, via an in-line volume control.
Important: **T3** & **T4** are high current types. These should be checked when first switching on, by placing a finger atop each one and it should not exceed about 75 degrees C when the relevant lamp bulb's potentiometer is turned up until the bulb is quite bright. Check T4 before T3. (Note: 70 degrees C is the hottest temperature surface which one can comfortably keep one's finger on).
The ZTX-792A transistor has its wires as c,b,e in a vertical line, with the transistor case as a **D** seen from its **top**, or e,b,c if viewed from its **wires'** side.

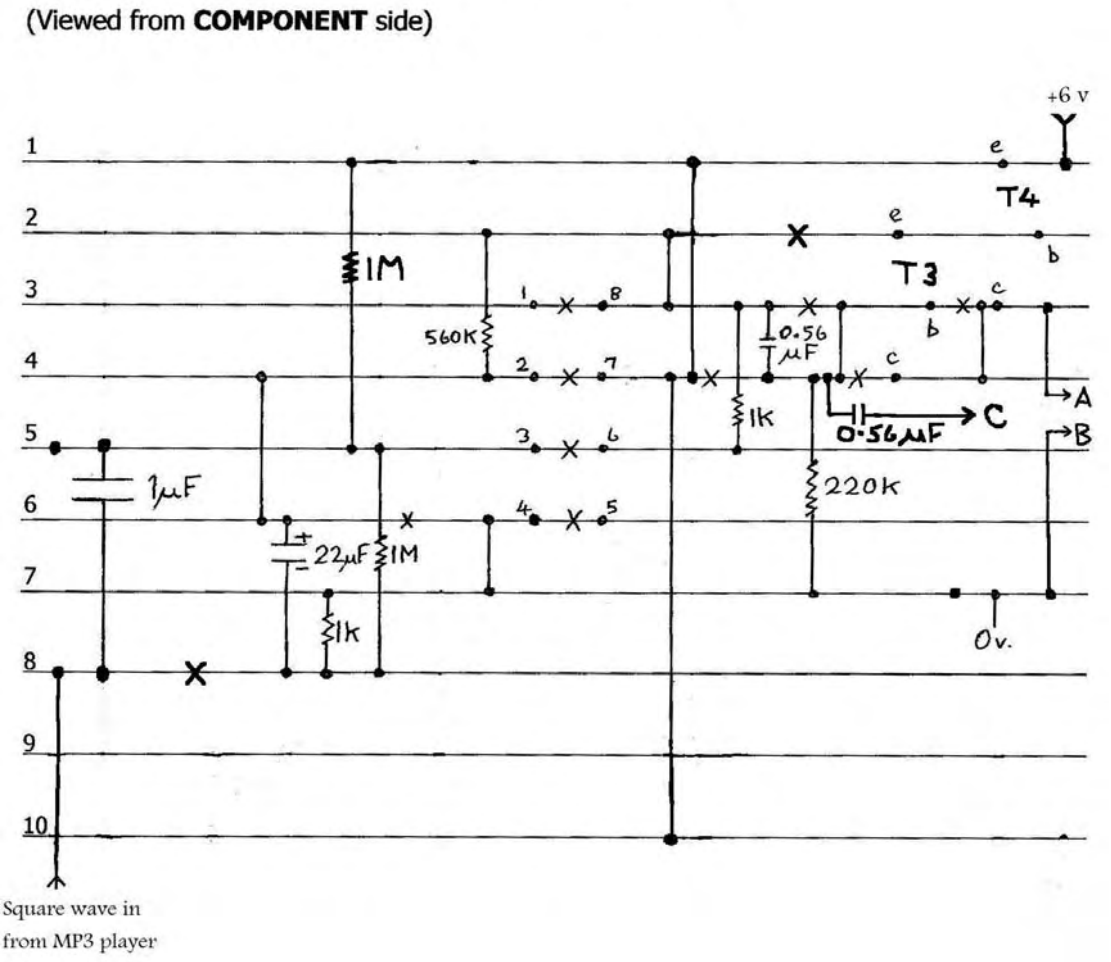


Fig. 9 a. Printed circuit layout board for Fig. 5a: square wave amplifier.

9b: Audio oscillator circuit layout diagram (below):
The lowest 10 tracks on the 30 track board are for the audio oscillator. Its voltage supply (5 to 7.5 volts) and zero volts supplies, are taken from the circuits above it. The audio oscillator output is connected via a 0.01 µF capacitor to the left flasher channel's track 5 (left-hand side), and is connected via another 0.01 µF capacitor to the right flasher channel's track 5 (left hand side).
The simple audio circuit generates a tone output which is connected to pin 3 of both the left and right 741 integrated circuits in the main flasher circuits, via a separate 0.01 µF ceramic capacitor for the left and right flasher circuit inputs, not shown on these circuit diagrams. The audio output pin on line 4 of Fig. 9b connects via these capacitors to copper track 5 on the upper flasher circuit (= pin 3 of the 741 I.C.), and similarly to the 741 of the lower flasher circuit.
Only one audio circuit is needed to feed audio to both flasher circuits.
Note: A larger capacitor than 0.01 µF gives a continuous audio tone at the earphones, instead of tone pulses which are in phase with the square waves (which are amplified to light the bulbs).
The audio oscillator board uses tracks 21 to 30 on the board, but these are labeled in Fig. 9b as 1 to 10, and are below the left and right square wave flasher channels which occupy the top 20 tracks on the same board.
The dots at the end of copper lines 1, 3 & 4 in Fig. 9b are single-sided printed circuit board pins, for connections to the main flasher circuits above it on the circuit board.
The BC327 transistor has its wires as c,b,e in a vertical line, with the BC327 transistor case as a **D** seen from its **top**, or e,b,c if viewed from its wires' side.

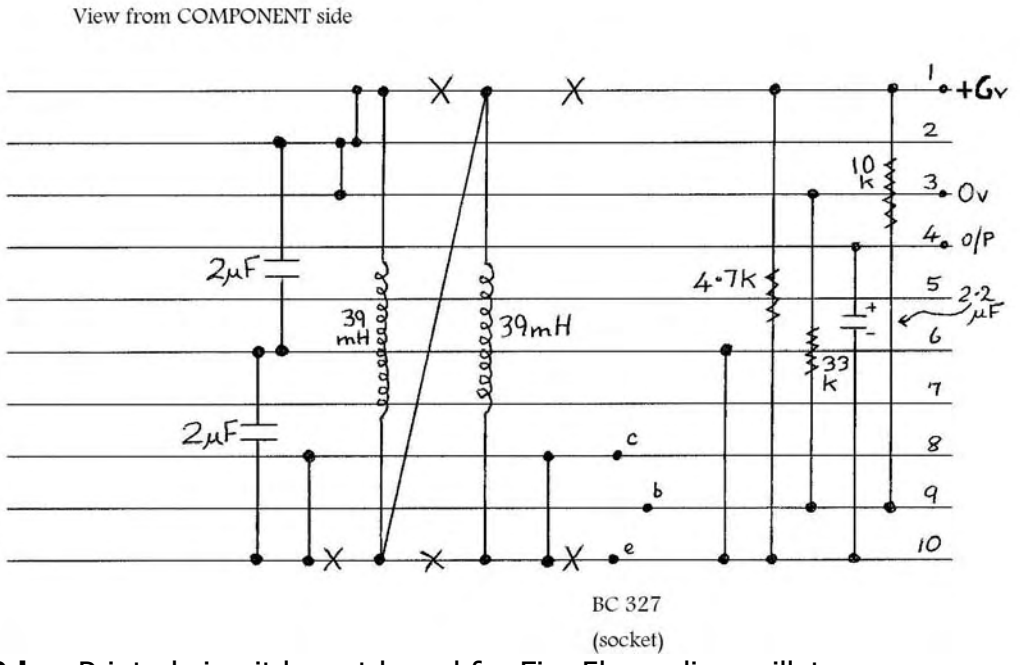


Fig. 9 b. Printed circuit layout board for Fig. 5b: audio oscillator.

APPENDIX 3: MORE DETAILED TECHNICAL INFORMATION

Rapid Electronic Method for obtaining Visual Imagery

NOTE: The Reference numbers in this Appendix 3 are for this Appendix 3 only, and they do not correspond to the reference numbers in any other Appendices above.

Caution: See the very last page (188) of this e-book.

CONTENTS:

Circuit diagrams & corresponding printed circuit board layout diagrams 2
Component Parts List 5
Glasses / spectacles 7
Square wave generator 14
USB audio device 16
Picture of constructed unit 17
Circuit testing & troubleshooting 18
Mind Mirror EEG spectrum analyser biofeedback graphs.....19
Oscilloscope Graphs (for testing only).....21
Miscellaneous instructions for use 23
Future research 25
SAFETY 26
References 27

Soldering safety:

Between uses, always put the iron where it cannot burn anyone, and because solder flux smoke is carcinogenic (like cigarette smoke) do not let it reach your face. Use a simple fume extraction system – some soldering irons are available with a simple in-built small fan, or consider working with a fan blowing the smoke away out of an open window as you solder, or work in a porch in open air.

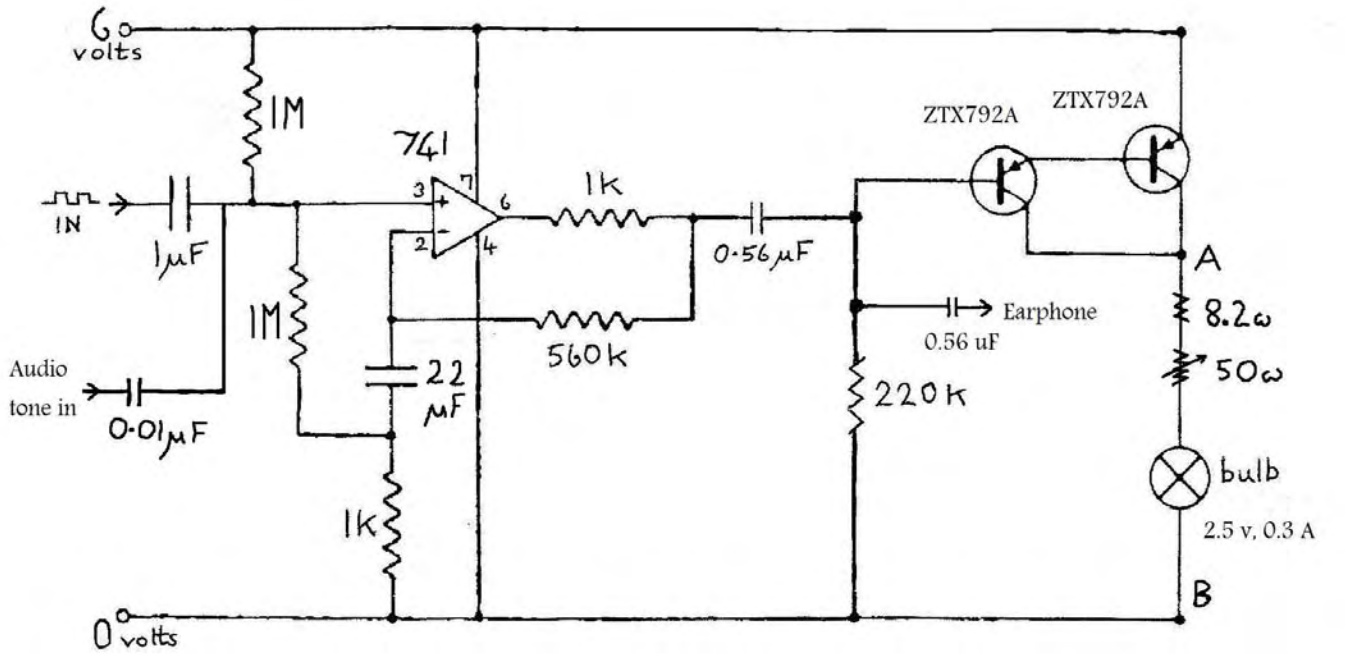
Do not forget to switch a soldering iron off, if room is unattended.

For printed circuit soldering, use an iron with a bit diameter not over 2 mm.

Skill and practice is needed to avoid creating unwanted solder "bridges" from one copper track to the next. If this occurs, use Cu solder-removal braid (from electronics suppliers like Maplin) and press it onto the unwanted bridge with the iron; the braid will remove the solder bridge. Or, invert the circuit board (i.e. with the copper tracks facing downwards) and try to run off the molten solder by gravity, onto a clean soldering iron tip coming up from below.

Soldering skill is the same as embroidery skill, and women have told me incorrectly that none would construct this (very simple) circuit. It is a fact that in electronics industry factories, women produce excellent reliable soldering on printed circuit boards.
Any science teenager with moderate dexterity could construct the circuits given below.

CIRCUIT:



A parts list is given later below.

Note: A silicon diode is shown on the layout circuit below, intended to prevent damage if the 6 volt power supply unit is connected with reverse polarity by mistake. This is good practice in circuit design, but has not yet been tested by the author (for any effect on performance).

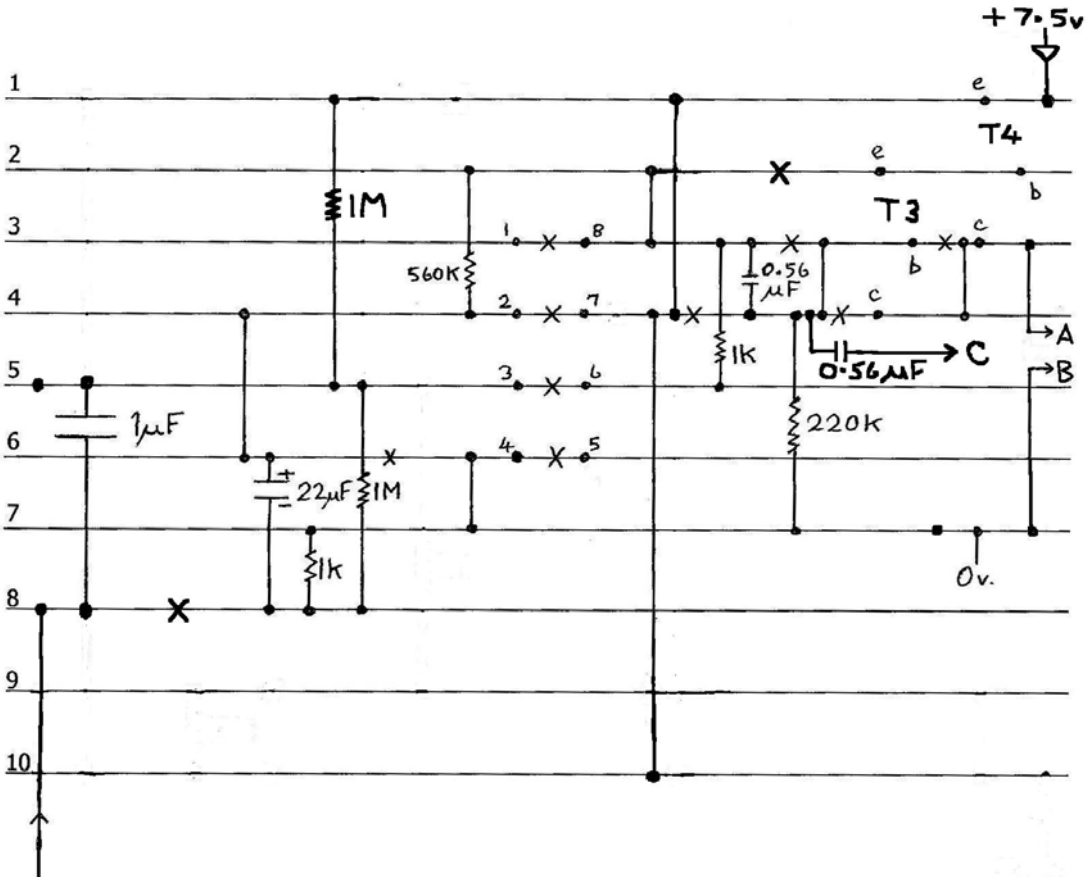
The last 10 tracks on the printed circuit board are for the audio oscillator, whose circuit is as shown below as the "AUDIO OSCILLATOR CIRCUIT". Its 6 volt and zero volt power supply are taken from the circuits above it. The audio oscillator output is connected via a 0.01 µF capacitor to the left channel's track 5 (left-hand side), and is connected via another 0.01 µF capacitor to the right channel's track 5 (left hand side).

Use sockets for the 741 I.C. and for all the transistors.

x means that the copper track is cut at the **x**, on the component layout diagram below. The view given below is as seen from the components side, but to see a view from the copper tracks side, many graphics programmes have an ability to convert a picture to its mirror image.

Layout of square-wave oscillator for L&S machine on printed circuit board:

(Viewed from **COMPONENT** side)



Square wave in, from MP3 player.

Note: Set the PSU to **6 volts**, not the 7.5 volts shown in the above diagram.

A & **B** connect to (not shown) a 50 ohm potentiometer in series with an 8 ohm resistor and the torch bulbs fixed to one of the spectacle lenses. The bulbs are in parallel with each other. One 3.5 mm stereo socket is used to connect to the bulbs, for each channel (L & R).

C (earphone from each channel, L & R) is connected via a 0.56 µF or 0.68 µF capacitor to a 3.5 mm stereo socket for the earphones.

The ZTX-792A transistor has its wires as c,b,e in a vertical line, with the BC327 transistor case as a **D** seen from its **top**, or e,b,c if viewed from its **wires'** side.

Important: T3 & **T4** are higher current types than used in an earlier prototype and are both **ZTX-792A**, available from Farnell. These should be checked when first switching on, by placing a finger atop each one and it should not exceed about 75 ºC when the relevant bulbs' potentiometer is turned up until the bulbs are quite bright.

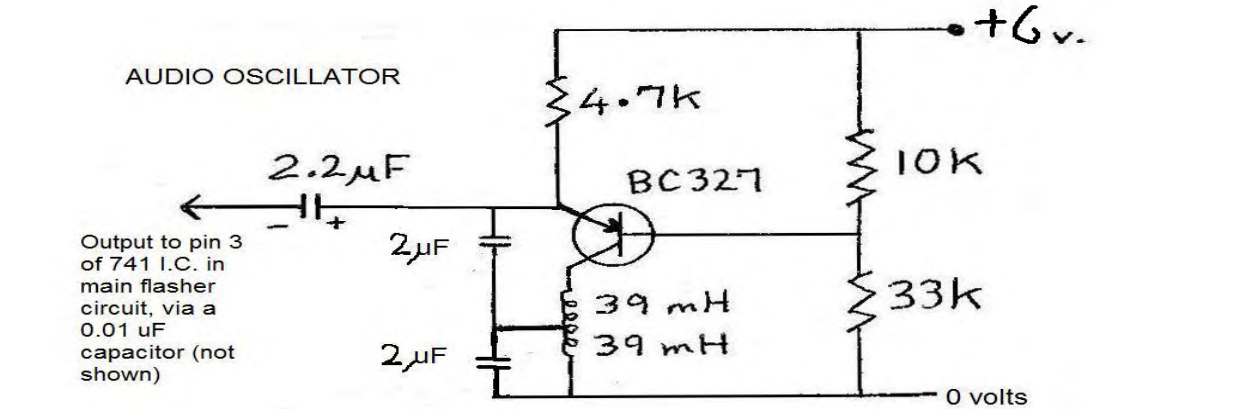
Check T4 before T3. (Note: 70 ºC is the hottest temperature surface which one can comfortably keep one's finger on).

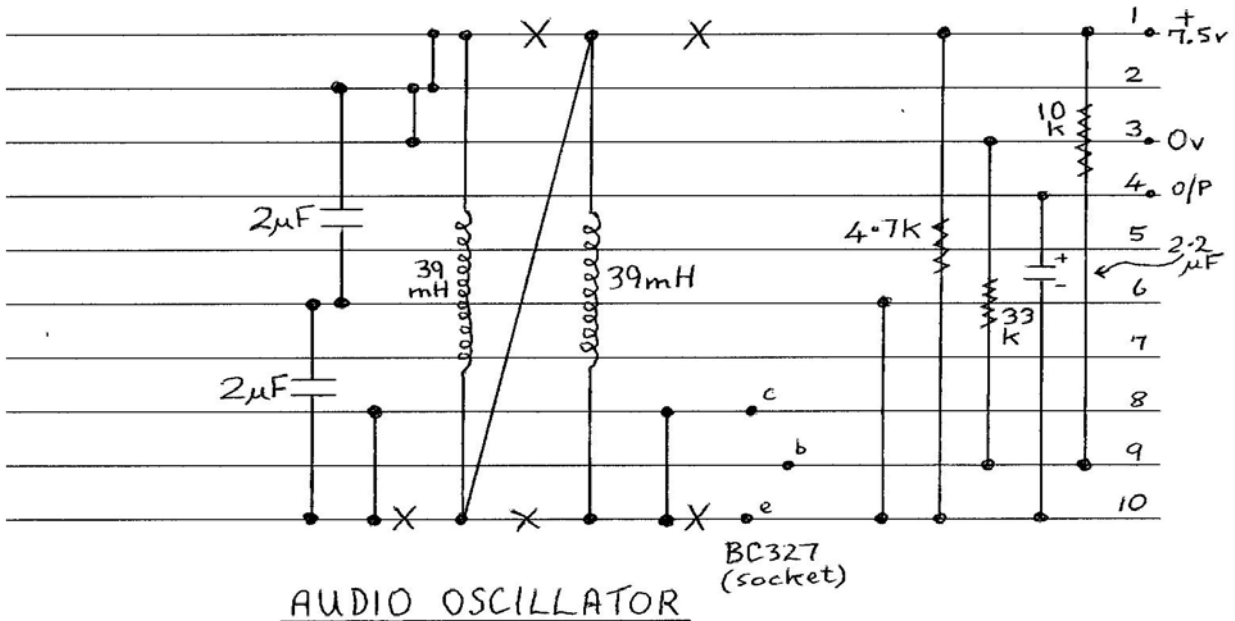
AUDIO OSCILLATOR CIRCUIT:

NOTE: This occupies the lowest 10 copper tracks of the 30-track circuit board containing the left & right flasher circuits (above it).

The simple audio circuit below generates a tone output which should be connected to pin 3 of both the left and right 741 integrated circuit in the main flasher circuit, via a 0.01 μF ceramic capacitor (<u>not shown</u> on these circuit diagrams). NOTE: A <u>separate</u> 0.01 μF is needed for <u>each</u> flasher circuit input (i.e. left & right). But only ONE audio circuit is needed, to supply the same tone to both boards.

<u>Note:</u> A larger capacitor than 0.01 μF gives a continuous audio tone, instead of tone pulses which are in phase with the square waves (which are amplified to light the bulbs).





AUDIO OSCILLATOR

Layout view, from <u>component</u> side

Note: The PSU was set to **6 volts** rather than the 7.5 volts shown on the above layout diagram. It is connected to the same 6 volts supply unit as the left & right flasher circuits on the same board above it.

The dots at the end of copper tracks 1, 3 & 4 are single-sided printed circuit board pins, for connections to the main flasher circuits above it on the circuit board. The pin on line 4 connects with a wire to Cu line 5 on the flasher board (= pin 3 of the 741 I.C.).
The BC327 transistor has its wires as c,b,e in a vertical line, with the BC327 transistor case as a **D** seen from its **top**, or e,b,c if viewed from its wires' side.
NOTE: Only ONE audio oscillator circuit is needed, not two.
x on the layout diagram means the copper track is cut at the x.

PARTS LIST: Box: Maplin Part No RL6335-F. This box has a thick wall which needs to be thinner where the stereo jack sockets are installed, needing a wider drill to bore part-way through the wall before drilling the jack socket holes.
Circuit board: Maplin Part No JP47, which has 30 rows of copper tracks. The top 20 tracks are used for the left & right channels and the lower 10 tracks are used for the audio oscillator circuit. Only one oscillator circuit is needed to drive both left & right channels.

Transistors: T3 & T4 are both ZTX792A; available from Farnell as part no 9526137 (£1 each).
(Transistors T1 & T2 do not exist – used in an early prototype device only.)
Transistor sockets: Use these in case easy changing is required: Farnell type 177-128 or equivalent small 3-pin type.
Bulbs: A prototype used a standard MES torch bulb (2.5v, 0.3A), for testing, but these are replaced by four LES bulbs, (6v, 0.06A), for each eye, for much improved performance, discussed later below.

Bulb holders: Conventional MES type, Maplin part no JX87U. MES torch bulbs can also be got from Maplin (part no BT96E (2.5 volt, 0.3 amp), or from Farnell as part no is 150-492. These are for testing only and LES bulbs (below) are used for the actual final device. If using MES 2.5 volt bulbs, the potentiometer must not be turned up too far, as the voltage to the bulb filament will exceed 2.5 volts and burn out the bulbs.

If miniature 6 volt LES bulbs (lamps) are used (recommended), different holders are needed: miniature tungsten bulbs, as in the DP L&S machine, obtainable from Farnell (see on internet) as part number 113-9306 (6 volt, 0.06 amp Lilliput LES lamp) Farnell part No 329-368 lamp holders are also

needed. Or Maplin part numbers are UJ72P (LES bulb holder) and BU12N (6 volt Lilliput LES bulb).

Other miniature bulb types are available, but it is probable that the DP spectacles bulbs are a miniature tungsten type, because they are dimmable and their light looks yellowish.

Resistors: Quarter watt, except the two 8 ohm resistors: 5 watt.
Capacitors: Low voltage types, non-electrolytic types.
Potentiometers: Two, 50 ohm, Farnell type 150-2919 (wirewound, 1 watt).
Battery Eliminator: (power supply unit, PSU), 6 volt (e.g. Maplin model L06BR, or any type giving at least 500 mA at 6 volt). Use 2.1 mm "power in" type socket to accept the 2.1 mm "power in" plug on the PSU, available from Maplin.

The circuit layout board is shown below, but only the top 10 tracks are shown, 1 to 10. Tracks 10 to 19 are identical to tracks 1 to 10, with track 10 being the positive 6 volt DC power input track, just like track 1, fed by the same single power supply unit (PSU).
So the emitter of T4 is on Track 10, but in the layout diagram below, only a 6 volt connection to track 10 is shown. The other connections must be added as in track 1 above it.
The zero volts track (16) must be connected to track 7.

The Maplin PSU Part No given in the parts lists has a 6 volt option. 7.5 volts can be used, optionally, for brighter flashing. A 6 volt supply is preferable.

Parts List for audio oscillator:
The 2 μF capacitors can be made up using two 1 μF capacitors in parallel (exact value not critical). The 6 volt supply and the 0 volts are taken from the main flasher circuit (no separate PSU is needed.)
If the 39 mH + 39 mH choke used, has different pin spacing, the layout needs to be modified to allow for this. Chokes available from Farnell at www.farnell.co.uk

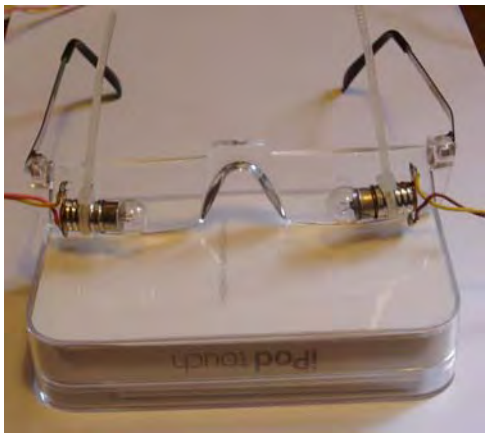
NOTE: The final audio output to the (external) earphone volume control is taken from the main flasher circuit at the connection from the 0.56 μF capacitor and the base of T3, via (another, different) 0.56 μF (or next available higher) capacitor. This audio output is taken from each channel (left circuit & right circuit) to a 3.5 mm stereo jack socket, into which standard low impedance earphones are plugged (like the normal

earphones used to listen to MP3 players etc). To control the volume, an external "extension cord with volume control" (available from Maplin etc) should be used if the audio is too loud. To effectively drive the brainwaves, the audio should be "quite loud", but not "very loud".

To decide which are the left and right earphones, it was easiest to listen to the session (without putting on the glasses) and note which earpiece gets the higher oscillation rate, and that is the 'Right' earpiece. The left earpiece wire should then have a simple knot put in it, to identify it as the left channel for future use.

GLASSES / SPECTACLES DEVELOPMENT

Pictures of the prototype plastic reading glasses (cost £3) used for tests:



Prototype glasses, using 2 MES bulbs

Shows the two cable ties used to secure the torch bulbs to the plastic reading glasses via drilled holes (supported on a small plastic box for this photograph). Two holes were drilled through each plastic lens, to thread the cable ties through. The cable tie ends (shown here still pointing upwards) were then cut short.
Important: The distance between the eyes of different people varies. To fix the torch bulbs in the right place, the glasses are put on, and then looking into a mirror, a fibre pen is used to mark the centre of vision spot for both eyes.
This is where the bulb centre should be, laterally. Then the holes can be drilled for the cable ties. The bulb centre should preferably be a little below the line of vision, which gives satisfactory brainwave entrainment, but avoids being too bright (can wash-out the imagery to some extent).

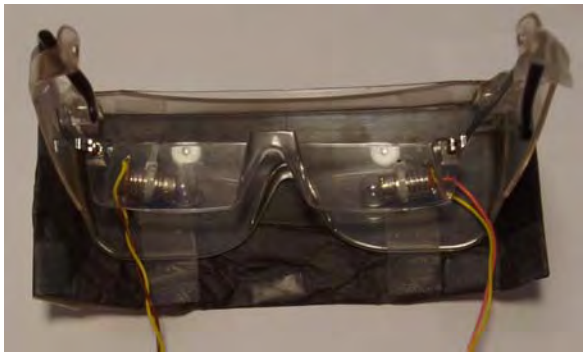
The picture below shows the standard MES torch bulbs lit up. The twin twisted wires shown, are unscreened. Screened wires are not necessary (and are typically not used in commercially available earphones, as they are

low impedance and so do not pick up mains hum interference). Thin and flexible wires are preferable, but able to carry a current of up to 0.2 amp:

Prototype glasses, using 2 MES bulbs

IMPORTANT: Both **contrast** and **brightness** are important. The spectacles shown above are ok in a very dark room (room lights off), but if there is **any** daylight then large safety-type glasses are **essential** to be worn over the spectacles shown above, and the safety spectacles must have **black paper** fixed to their inside with Scotch "Magic Tape" ™. Suitable large coverage angle glasses are available from suppliers of safety glasses intended for safety protection when drilling etc. They must be a type with a fairly flat plastic front, not convex-fronted.

It is essential is to have high contrast – the degree of blackness between flashes must be very black; if it is grey, the images will have a "washed-out" appearance. The blackness was tested wearing the safety spectacles with the power supply off, closing the eyes and assessing if the blackness is satisfactory. Both glasses combined are shown below; their side frames are held together with Scotch tape. The black card is taped to the inner side of the safety spectacles. (Ignore the two white circles, which are reflections of the photographing lamp used.)
NOTE: The final improved glasses are shown later below.



Prototype glasses, using 2 MES bulbs

This is a prototype, using single MES bulbs, but see later below for the **final** glasses design used, having instead four LES "pygmy" bulbs at **each** eye.

CAUTION: If MES (2.5 volt) bulbs are used, e.g. for circuit testing, they will burn out if the two potentiometers are turned fully clockwise (delivers nearly 6 volts).

Getting the bulbs the right way round: It is confusing to achieve the correct connections to get the 6 Hz flashes to the right-side bulb. With the (free) "Audacity" programme (discussed later below) on the computer screen, the square wave programme was loaded and the Fast Forward icon was clicked to get the cursor to the end (39 minutes); then the cursor was dragged to the left to about 46 minutes and then the Play button was clicked, for a test. The right-hand 50 ohm potentiometer should control the slower-flashing bulb (ignoring the bulb's position on the spectacles for now), and if not, the solder connections were changed over at the jack socket which accepts the jack plug from the USB Audio Device. After doing this, the left bulb should be flashing faster than the right and if not, the bulb holders were changed over at the spectacles.

It is also important that the audio pulses to the earphones are the correct way round; the sound is crossed over, so the sound pulses to the left ear should be in step with the light flashes to the right eye. So near the end of the programme (say at about 46 minutes: see paragraph above), it was checked that the left earphone is sounding at 6 Hz, and if not, the earphones were just changed over, and marked for future quick reference. An in-line accessory "extension cord with volume control" was used to adjust the sound volume, available from Maplin, etc.

Brightness controls are provided for the two bulbs, and after about 12 minutes into a session, the left-hand control knob could be manually turned fully down, to remove the faster flashes from the left-eye bulb, to begin the enhanced imagery. Just before this, the right earphone was pulled out. About a minute later, the (lower frequency) left audio earphone can optionally be pulled out, or left in (but more distracting and not necessary nor recommended).

It is essential at first to be in a darkened room, but much later (only after several successful image visions) the author experimented with a table lamp shining into the closed eye (**after** the visions have been obtained), to give a Ganzfeld uniform low illumination (from scattered red light through the eyelid), to see if that has a useful effect. The result of this is still uncertain. (For experiment, but not recommended.)

Suggestions for using single MES bulbs (not recommended except for testing)**:**
After about 12 minutes, which is about 3 minutes after the ramp down to 6 Hz is complete, and with the left bulb turned fully down (using its 50 ohm potentiometer) and the right audio earphone removed, the spectacles were moved slightly down the nose so that the right-side bulb is further down the field of view (which may reduce the flashing's distracting effect).
Also worth trying after a few minutes, was moving the spectacles (at an awkward angle!) so that the right side bulb is over the right side of the right eye, which reduces the flashing distraction without reducing the imagery.
Also tried was moving the left (6 Hz) earpiece to the right ear.
This could give an image with less flashing distraction – worth trying.
Many other variation experiments are possible, including different target frequencies after ramp-down.

Reversing all the left and right stimuli (flashing and audio) also gives imagery: **recommended** every few days.

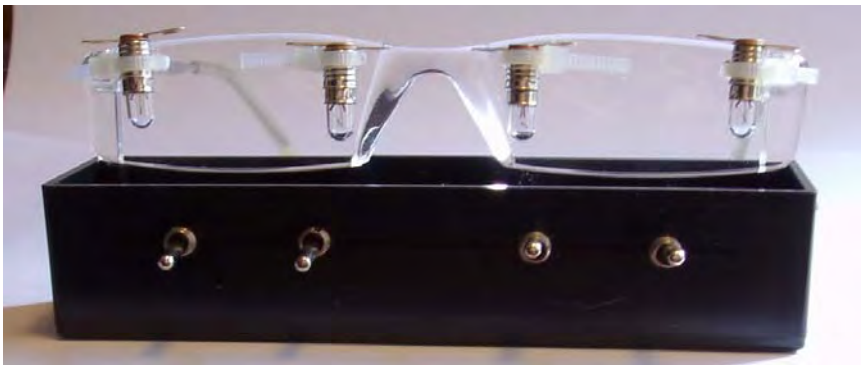
It is reported that the left and right fields of view of each eye separately, go to the right and left brains respectively [8, 9]; i.e. reversal occurs for each eye separately. Siever [in 8] reports that a problem with whole eye stimulation systems is that they do not account for the distinct visual fields that exist in each eye:
The left visual field of both eyes activates the right brain, and,
the right visual field of both eyes activates the left brain.

This suggests that lamp bulbs may be best placed so that four bulbs are over each eye, arranged such that the left-most bulb over the right eye can be blocked out, to stop flashes from the right eye from activating the left brain. But early results indicate best results are obtained instead by switching off the two right-most bulbs over the right eye.

Spectacles with 4 "Lilliput" LES bulbs can be used to investigate the effect of switching off (say) both of the bulbs at the left eye and the right field of view bulb at the right eye, which may be a useful alternative to the above suggestion of just moving the spectacles down the nose to reduce the flashing while not losing the imagery. See ref. [8] for other experiments and more discussion of the cross-over.

All-plastic "reading spectacles" are available for about £3 from many public libraries (or by mail order from ReadySpex) and were used to fix four miniature Lilliput LES bulbs onto: two on each lens, fixed side-by-side, spaced out laterally to illuminate the left & right fields of view, for each eye. LES miniature bulb sockets can be held by cable ties secured through holes drilled through the plastic spectacle lenses.

To connect these 6-volt bulbs, four Maplin part no FH99H (double pole double throw {DPDT} switches) were used to separately switch any of the four individual goggle bulbs on or off. (This is not the final arrangement – see later below)
E.g. for some early experiments only, the two left spectacle lens 6-volt LES bulbs were connected, in parallel, to the light pulse output of the left flasher circuit board, so that if one bulb is switched off the other will stay lit. The DPDT switches should be mounted in a separate small box (Maplin Part No FT31J) with ventilation, which switch over from the LES bulb fixed to the spectacle lens, to an identical LES bulb mounted inside the box, to avoid any switch-over brightness change of the other bulb, on the spectacle lens, which is powered from the same circuit. See picture below:



Four 6-volt 'Lilliput' bulbs are secured to 'ReadySpex' plastic spectacles, with 4 cable ties threaded through 8 holes drilled through the plastic lenses. (Shown resting on the switchbox with a switch for each bulb.)
PROTOTYPE

NOTE: No 8 ohm resistor is optional for the 6 volt LES bulbs – it is only essential for MES-type 2.5 volt torch bulbs.

NOTES added after the above tests were done:
(1) Preliminary results with the above spectacles containing 2 LES Lilliput bulbs for each eye, showed no advantage over the original one-bulb per eye MES spectacles used. But this may be because the LES bulbs were fixed too high on the spectacles and the middle two bulbs were too near the nose. Also no divider (screening) was placed between the two right bulbs, nor between the two left bulbs. See also the notes in reference [8] below. But the following is more important:

Improved visions were obtained using 4 miniature "lilliput" 6v, 60 mA, LES bulbs in an array over each eye (instead of just one MES torch bulb per eye), sandwiched between two pieces of thin paper for diffusion of the light. This spreads the flashing over a wider field of view. The room must be totally dark (e.g. very early winter mornings) **or**, black cloth must be fitted over the front of the lamp spectacles to ensure that the background is as black as possible. A grey or lighter background reduces the essential contrast of the images to an **unusable** state.

(2) **IMPORTANT:**
The author had not then realised the importance of filling the whole field of view with flashing light. Later tests using the D.A.V.I.D.™ Paradise (DP) eye-set, with the simple circuit given above in this article, showed a **much improved** result over that obtained using the spectacles described and pictured above. The DP eye-set uses two white translucent diffusing screens fixed over four LES-type bulbs, arranged in a diamond shape, unlike the simpler four LES bulbs arranged in a horizontal line on plastic spectacles as in the picture above. The cold resistance of the four DP bulbs in the left set, is 8 ohms, and the right side is also 8 ohms. Fortunately, although LES bulbs connected in parallel (the standard 6 volt type, from Farnell or Maplin) have a different resistance, a satisfactory brightness is obtained when used with the final circuit given above in this article (without the two extra 8 ohm resistors). Two pairs of 2 LES bulbs connected in parallel are needed for the left side, and two more for the right side. Wiring details are below.

The first picture below shows the DP eye-set layout with the bulbs lit. The DP uses a standard type of dark sunglasses with length-adjustable side arms [3]:

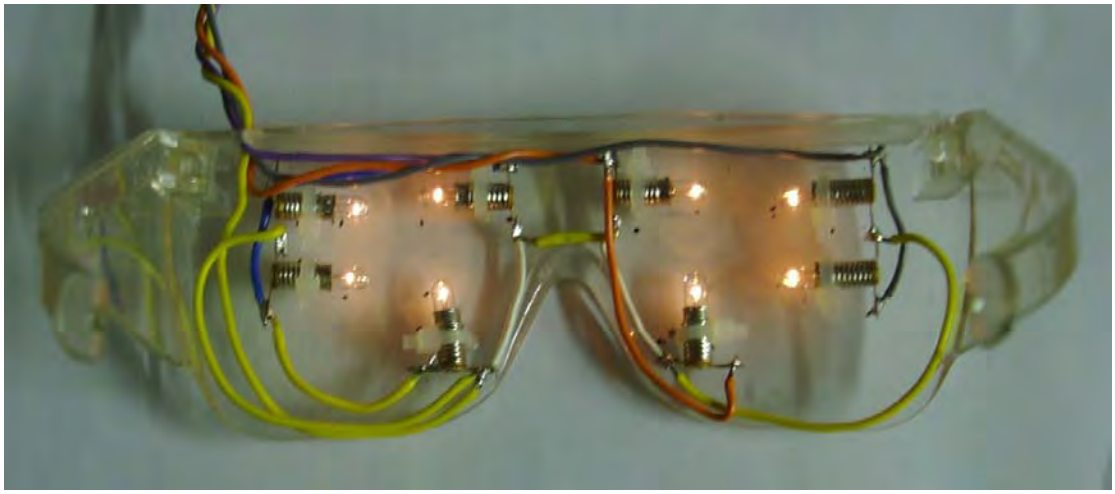
D.A.V.I.D. Paradise™ Eye-set

View from other side

Any ambient light must be blocked out. For a prototype DIY version of such an eye-set, this can be done with black paper stuck onto the inside of the sunglasses, with white paper stuck over it (to reflect light into the eyes). Four LES Lilliput bulbs (6 volt type as used earlier above) can be fixed using cable ties through holes drilled through the sunglasses' visor, as was done above in the earlier simple spectacles.

The **final non-prototype** glasses / spectacles uses plastic "safety glasses" with flat "lenses", but instead of a diamond-shaped array, the 4 LES bulbs are in a square array of side 1.6 cm between the bulb filaments. This allows each vertical pair of bulbs to be switched off (with in-line switches in the wires to the glasses) independently, for vision improvement (explained below).

The picture below shows partly-constructed spectacles, before adding the white diffusion screens to spread out the light over the full field of view. After the screens are added, behind and in front of the bulbs, the wiring and individual bulbs are not visible. To receive the full voltage (about 6 volts) at each bulb, the four vertical pairs of bulbs are (each pair) wired in parallel.



Spectacles with 4 + 4 "lilliput" (LES) 6 volt 60 mA lamp bulbs.
FINAL DESIGN, at partly constructed stage

These 8 bulbs are fitted in plastic "safety glasses"; the right side-arm (to the ears) is clearly visible on the extreme right. This view is from the wearer's side, before the light diffusing screens were added. The type of safety glasses used was selected to have almost flat-front large-area plane lenses. Avoid glasses with curved fronts.

Construction & wiring details – final (non-prototype) glasses:

Wiring: The wiring of the two right-most right-hand side bulbs above, is clearly seen to connect the two adjacent right-most bulbs' terminals together and a yellow wire goes out from there to the casing (zero volts) contact of the metal "stereo" jack plug used for the spectacles/glasses. The other two bulb terminals are seen both connected to a grey wire, which goes (via a SPST switch) to the "band" ("RHS stereo") contact of that "stereo" jack plug. Thus, the two right-most side 6 volt bulbs are in parallel. There is a switch (not seen on the picture here, but similar to that shown in the figure above the figure marked "D.A.V.I.D." above), which is conveniently put in a small black junction box like that seen in that earlier figure. The junction box is positioned in the wiring harness, near to the jack plug end of the wiring harness.

The other vertical pair of lamp bulbs in the figure, also over the right eye, are similarly wired to the same contacts in the "stereo" jack plug, via another switch (total of 2 independent switches) so that each of the total 2 pairs of bulbs over the right eye can be independently switched either ON or OFF. The OFF position is only used after about 10 minutes (see instructions in Fig. 1.2 of Chapter A(ii)).

The other two pairs of lamp bulbs (total 4 bulbs) over the left eye are wired similarly, but without switches (unless needed for future experiments), but connecting each pair between the stereo jack plug casing (zero volts) and the tip ("LHS stereo") of the jack plug.

Before starting, to avoid errors, it is essential to first draw the wiring diagram on paper, from the above description, if making the spectacles/glasses.

Light diffuser: Plastazote sheet is widely available (searched for in Google). LES bulb-holders are 6 mm diameter, so a thin plastazote sheet 6 mm thick, with holes cut to accommodate the LES bulbs and holders, can be glued to the inside of the safety glasses. A layer of aluminium "cooking foil" can be glued to the outside front of the safety glasses (this metal foil should not be glued to the inside, to avoid possible short circuiting any lamp bulb contacts through the metal foil.)
A thin white translucent screen (about 0.7 mm thick) is then glued to cover the plastazote sheet. The translucent screen used in the DP spectacles (pictured earlier above) looks like translucent HDPE (high density polyethylene) but is probably another material, such as PVC, because polyethylene is difficult to glue as most adhesives do not stick to it. It must be translucent, not transparent, to diffuse the light. The degree of translucence is similar to that of the HDPE plastic milk cartons in supermarkets.

Three Velcro ™ adhesive-backed circles (13 mm diameter) are fixed near the ends and centre of the plastic diffusing screen so that another (optional) similar diffusing screen (which has 3 corresponding Velcro circles stuck to it) can be fixed to the first screen. There is then about a 4 mm gap (optional) between the two diffusing screens, to give further light spread-out.

The two 8 ohm resistors are not required for 6 volt LES bulbs, and if fitted in the flasher circuit, can be (optionally) shorted out with a suitable switch. Brightness is reduced slightly if the resistors are left in; bright flashes are needed for effective brainwave entrainment. (Reminder: eyes must always be closed during use.)

Note: The commercial DP eyeset (pictured earlier above), is not suitable, as its diamond array of the bulbs cannot switch off light to the left and right sides of the eyes, and a square array of bulbs is needed instead.

Notes on square waves, generated by a computer:

A square wave generator is needed as the input to the main flasher board, which after amplification by T3 & T4 sends flashes to the bulbs.
A computer can be used to generate any of the ramped frequency paths used by commercial L&S machines. **Note:** The computer output can be recorded into a small MP3 player etc, so there is no inconvenient requirement to have a computer available whenever the light & sound unit is being used.

The author has made a programme which gives a similar frequency ramping path for gradual brainwave entrainment, as used in the DP and all other L&S machines, which is, for the present requirement:
10 Hz flashes into both eyes, ramping up during 9 minutes to a target frequency of 18 Hz (Beta) flashes into the left eye, and, ramping down during the same 9 minutes to a target frequency of 6 Hz (Theta) flashes into the right eye. The ramp up (left eye) from 10 Hz to 16 Hz is over 4 minutes, followed by a shallower ramp up to 18 Hz over 5 minutes. The simultaneous ramp down (right eye) from 10 Hz to 6 Hz is at a constant rate over the 9 minutes. Then, there is 40 minutes of constant flashing rates of 18 Hz to the left eye and 6 Hz to the right eye. The programme can be quit by the user at any point during the 40 minutes. Before using any flashing lights, see the Caution at the end of this article. This article is not a recommendation for anyone to use flashing light systems and professional advice must be sought if in doubt.

In step with the lights, 10 Hz sound pulses enter both ears, ramping down to 6 Hz sound pulses into the left ear and up to 18 Hz sound pulses into the right ear. The circuit for this audio is described above. The two audio outputs are connected to the stereo earphones, with flexible co-axial wires, of the type used for stereo earphones. These wires need to be small diameter and flexible, to avoid a distracting drag force on the earphones.

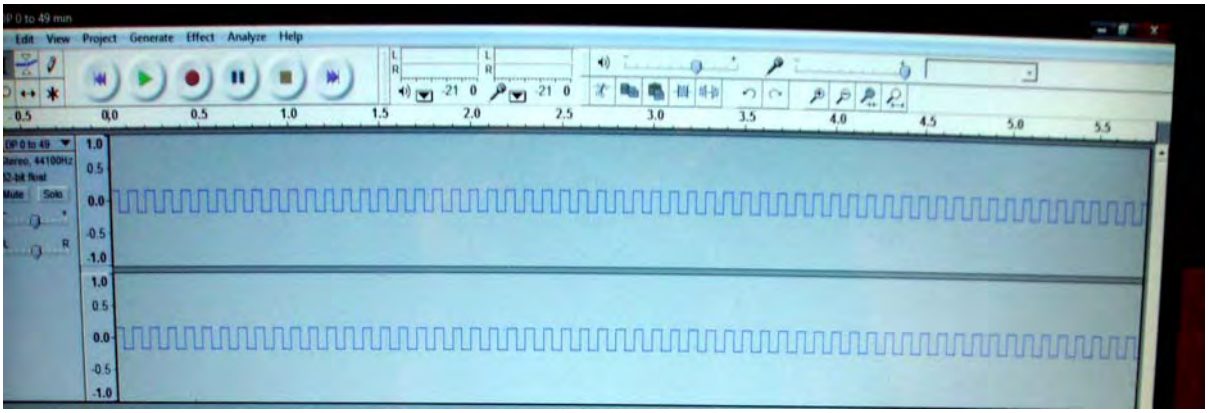
The computer waveform will be downloadable soon from the writer's website, www.4-D.org.uk/Books but if the writer has data download charges to pay, it may have to be withdrawn! It can be posted on a CD, on request to mgh@4-D.org.uk (with a stamped addressed CD mailing packet), or, the procedure for making it is as follows:

Download a computer programme called "NCH Tone Generator" from NCH (their website is www.nch.com.au/Tonegen) Use this to make a stereo square wave with left start frequency 10 Hz and end frequency 16 Hz and duration 4 minutes (240000 milliseconds), and right start frequency 10 Hz and end frequency 8 Hz and the same duration (240000 ms). Save this file as "LS 0 to 4 min" as a **wav** file.
Do the same procedure for the remaining 5 minutes, for left & right eyes (left start 16 Hz, end frequency 18 Hz) (right start frequency 8 Hz, end frequency 6 Hz) (duration 5 minutes). Save this stereo file as "LS 4 to 9 min".

Finally, make another file with left start frequency18 Hz and end frequency 18 Hz, and right start frequency 6 Hz and end frequency 6 Hz, with duration (say) 40 minutes (2400,000 ms). Save as "LS 9 to 49 min".

Then add these 3 files together, using a free digital audio editor programme called "Audacity" (available free from http://audacity.sourceforge.net).
In Audacity, load first the biggest file made above.
Then load the "LS 4 to 9 min" file and go to Edit and Select All and Copy.
Then go back to the big file (already loaded) and click on Paste.
This should paste the 4 to 9 min file at the cursor (which, if not disturbed, will be at the big file's start).
Wait for it to complete. If nothing happens, click on a toolbar with a magnifying symbol with a horizontally elongated "H" below it ("fit project in window").
Then save the combined file as "LS 4 to 49". Then re-load it.
Then repeat the addition procedure, to add "LS 0 to 4 min" also at the start of the "LS 4 to 49" file.
Wait for it to complete. If nothing happens, click on a toolbar with a magnifying symbol with a horizontally elongated "H" below it ("fit project in window").
Save the result as "LS 0 to 49".
Check that the final file is actually 49 minutes long: use the time scale and Fast Forward symbol atop the Audacity window on the computer screen.
Then inspect the file by repeatedly pressing an icon in toolbar with a magnifying glass with a "+" in it. Press it repeatedly until recognisable square waves appear.
Then click the "Play" triangular button and listen to the square wave, to check ok.
Use this file as the input to the above circuit.

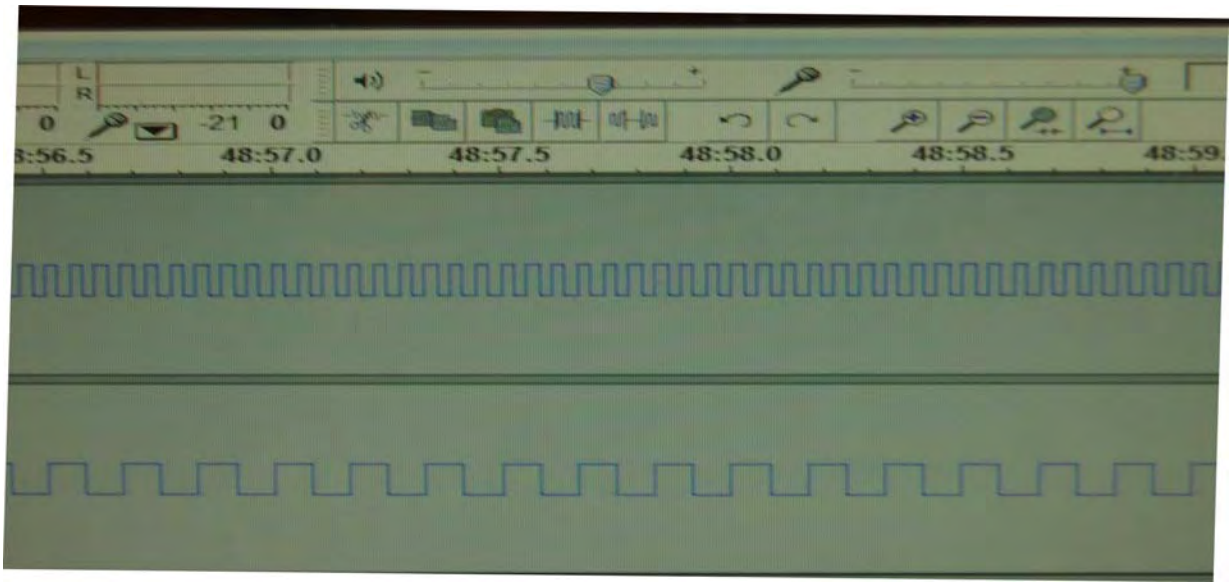
The final on-screen result is shown below. To see this square waveform, it is necessary to click on the magnifying glass icon marked "+" (many times) to get these views:



This is a picture of the "Audacity" programme on the computer screen. The "volume control" (see loudspeaker icon scale, above 2.7 on numbers scale) is shown above at about 75%. The left (upper stereo channel) shows square waves, as does the right (lower) graph. These slowly diverge away from the starting 10 Hz.

These screen pictures are of a **wav** (Microsoft) file, which is a very pure square wave but if it is converted to a smaller **mp3** file, the square edges are "noisy", but this does not affect the flashing. Copying and pasting mp3 files may add further noise - if experimenting, check the waveform against the pictures given here.

The later result (fast-forwarded to nearly 49 minutes), is shown in the picture below, where the volume control is seen above 48:57.5 (being 48 minutes & 57.5 seconds). The left channel lamp would flash at the left eye target frequency of this programme of 18 Hz and the right channel lamp would flash at 6 Hz (right eye):



Note: The lower trace is the **Left** stereo channel. This was connected to the TIP of the 3.5 mm jack socket, which should be wired to a printed circuit board marked "**L**" with a fibre pen. Convention: tip is left audio stereo channel.
If the result in the earphones comes out the "wrong way round", this is covered in the "Instructions for use" section later below.
(For any cross-over experiments later, a stereo plug was connected to a stereo line socket (not a chassis-type socket) with short wires, and, to create a cross-over, the tip of the plug was connected to the ring of the socket, and vice-versa.)

The two 3.5 mm jack sockets were marked as:
'SQUARE WAVE IN' & **'TO EARPHONES'.**
See the box photograph below.

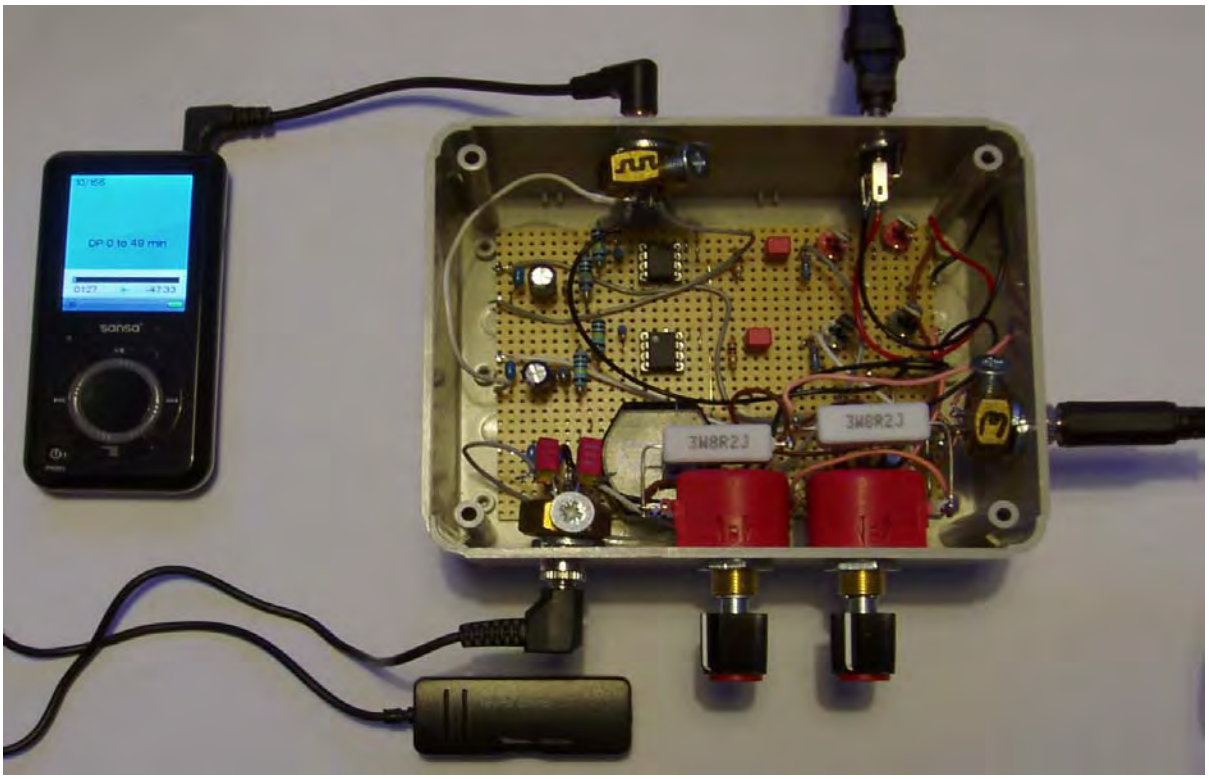
USB Audio Device:
This can be bought from many suppliers, and is the equivalent of the well-known "sound card" in desktop computers. When plugged it into a USB port, it will automatically activate itself and cut off the computer's internal speakers, if the above square wave programme is loaded before plugging it in.
A 3-wire (stereo) output jack plug was connected from the USB Audio Device via a jack socket to the two flashing light circuit inputs on the circuit boards. The Notes above describe which connects to where. A "stereo plug to plug" extension cable was used (from Maplin etc).
On the computer screen, the "volume control" (atop the Audible computer programme window) was set to about **half** (50%), as it is best not to put continuous square wave into the USB device at full volume. Proper operation of the device was checked by

plugging earphones into it (at half volume!). If a 2-way stereo adaptor is used, earphones could be plugged into one of it two outlets, and the flashing unit into the other, for testing. The earphones' jack plug was removed after testing.
The Audio Device should feel **cool** at all times: checked several times, with the square wave running and lights flashing, and with the power to the lights switched off. **An oscilloscope** was **not** connected to the flashing light bulb circuits **unless** a 10K (for protection) resistor is placed in the connection to the **negative** (ground) input of the oscilloscope (see instruction below). It is not essential to use an oscilloscope for fault finding.

Note: It is **not necessary** to have a computer available while using the flashing lights unit, because the output of the USB Audio Device can be copied to any small recording device as an mp3 file. More details are given later below.

The two identical circuits (for left and right bulbs) made it easy to find a fault, by comparing voltages at similar points and by swapping components (the power was switched off before removing or inserting components). Both transistors, and the 741, are in sockets, to make changing them easy. There are no T1 & T2 (only used in an earlier prototype). The same power supply is used for all the boards: +6 volts.

Picture of circuits: circuit board containing left & right flasher components and audio components, in Maplin RL6335-F plastic box:



The picture above shows the constructed bulb-flasher & audio circuits.
The printed circuit board has the left and right identical flasher bulb circuits on the top 10 and next 10 copper tracks, and the audio circuit on the remaining 10 lower tracks. The two pink 50 ohm potentiometers control the left & right bulb brightnesses.

The grey 3 watt resistors (8.2 ohm) are above each potentiometer.
The "power in" socket on the top right has a plug in it, from the 6 volt PSU.

NOTE: The square wave input (recorded from the computer onto a Sansa solid-state MP3 player, shown on the left), is seen at the top left of the above picture. But it should better be placed instead on the lower left of the box, to allow the circuit board to be "hinged" up simply, by easy removal of only the "power-in" socket at the top of the box.

The 3.5 mm stereo jack socket audio output next to the knobs, is shown connected to an external volume control (the small black box below the main box), essential to allow the audio volume to be adjusted. The two red items at this socket are two 0.68 μF capacitors soldered to the left & right output pins of this socket.

The black 3.5 mm stereo-type socket at the lower right of the main box picture is the output to the two bulbs of the spectacles.

The wall thickness of the plastic box is troublesome, as the thread on the 3.5 mm stereo-type sockets is too short. This was solved by not using the threaded bushes at all, and securing the sockets with large brass nuts which had been drilled through one of their hexagonal flats and the drill-hole tapped to take a set-screw, seen in the picture above. The large brass nut was sprung tight to the plastic box with a split-type of shake-proof washer and the assembly was held tight to close the shake-proof washer using water-pump pliers while the set screw was tightened very hard. When the pliers were removed, the socket was secure and would not turn. Holes were drilled in the plastic box wall for the full diameter of the body of the Maplin 3.5 mm stereo sockets used. Alternatively, an easier solution may be to use a large diameter drill to part-drill through the box wall, before drilling the through-hole for the jack sockets.

Stand-offs were placed on the 4 screws which secure the box lid to the box, to leave an annular gap for ventilation. These stand-offs are conveniently brass nuts which have a loose fit to the 4 lid screws.

Circuit testing of bulb flasher circuit, before any using:

Refer below to section on Troubleshooting.
Check carefully for any solder bridges between Cu tracks. Check that no gaps (marked as **x** on the layout diagram) in the Cu tracks were forgotten to be made.
Before connecting power, check with a resistance meter if available, that the input resistance is very high (about 100k ohms across the 6 volt input PSU terminals).
Fairly quickly turn down the 50 ohm potentiometers if the bulbs are too bright, or they may soon burn out (start with the potentiometer midway through its turning range, to minimise this possibility); this applies if 2.5 v MES bulbs are used, but not if 6 v LES "pygmy" bulbs are used (greatly preferred).
If an oscilloscope (not essential!) is used to trace the square wave through the circuit, be aware that the negative of the output from the USB audio device is about 2.5 volts away from ground (the oscilloscope input negative terminal): so **caution:** The USB Audio Device will get hot and soon burn out unless a 10K ohm resistor is put **in**

series with the **negative** oscilloscope input terminal and the flashing unit's output jack negative terminal (screen). The Audio Device should run quite cool (check this).

Troubleshooting:
(1) BEFORE first switch-on, solder bridging was checked for between adjacent copper tracks. Use a strong lens – even tiny strands of solder will cause a fault.
(2) The supply voltage was **quickly** checked at switch-on, to be actually about 6 volts.
(3) Replacing transistors if suspected faulty (very low cost).
(4) The lights' jack plug should not rotate such that either the L or R solder contact touches onto the ground contact! If there was rotation, a paper was wrapped on the ground contact to stop a short. Check for a blown bulb.

Mind Mirror biofeedback measurements:
A Mind Mirror II spectrum analyser electroencephalograph (EEG) [5] was used to find the brainwave frequencies during a vision of the moving trees observed while using the DIY L&S device costing only £25, if self-constructed from the simple circuits given above, designed for DIY.

For the EEG measurements, both earphones were removed. (Using earphones, not headphones.)
This left **only** the right eye flashing lights active, at 6 Hz (see Fig. 1.2 in Chapter A(ii)).
So the left eye view was free of flashes.

For the EEG measurements, when the trees' image stabilised, at 6 Hz, the EEG "hold" button was pressed, to freeze and record the display on the Mind Mirror EEG.

The EEG traces showed:

High beta (38 Hz): A very high (off-scale) left-hemisphere peak, and a medium-high right-hemisphere peak.
Delta (1.5 Hz): A large delta peak on the left, which vanished when the strobe was switched off.
It may be significant that the 6 Hz theta flashing frequency is a harmonic of 1.5 Hz (delta).
Further tests are needed, such as the effect of ramping down to 1.5 Hz (delta) to the left eye, instead of to the 6 Hz (theta) used, &c.
The actually measured final EEG frequencies of 38 Hz and 1.5 Hz, instead of the notional target frequencies used (18 Hz and 6 Hz), but it may make little difference if the brain settles naturally into its preferred final frequencies. Voss et al [1] found that only 25 Hz (high beta) and 40 Hz (gamma) caused lucid dreams, indicating that beta or gamma are essential.

The EEG results are given below:

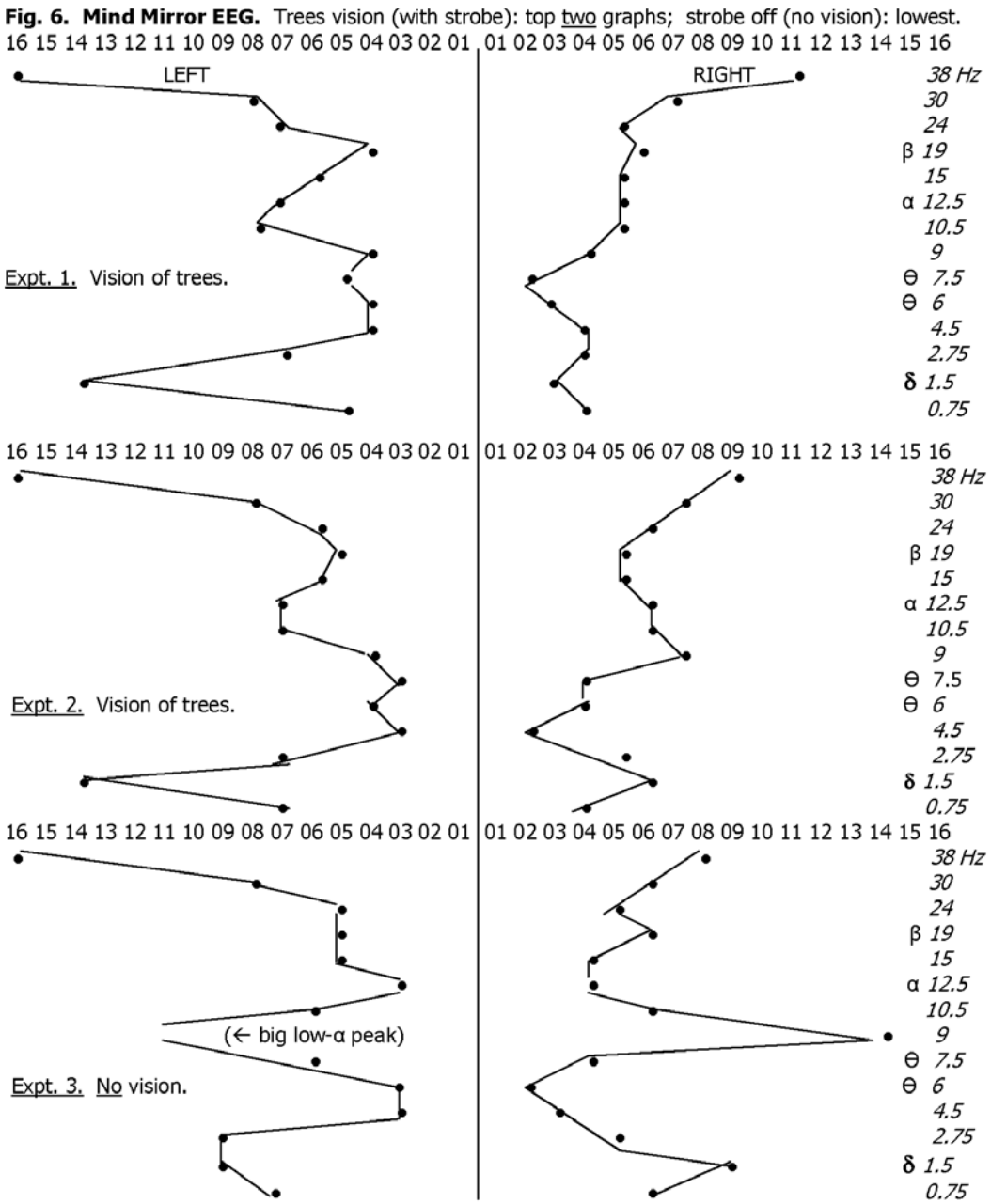
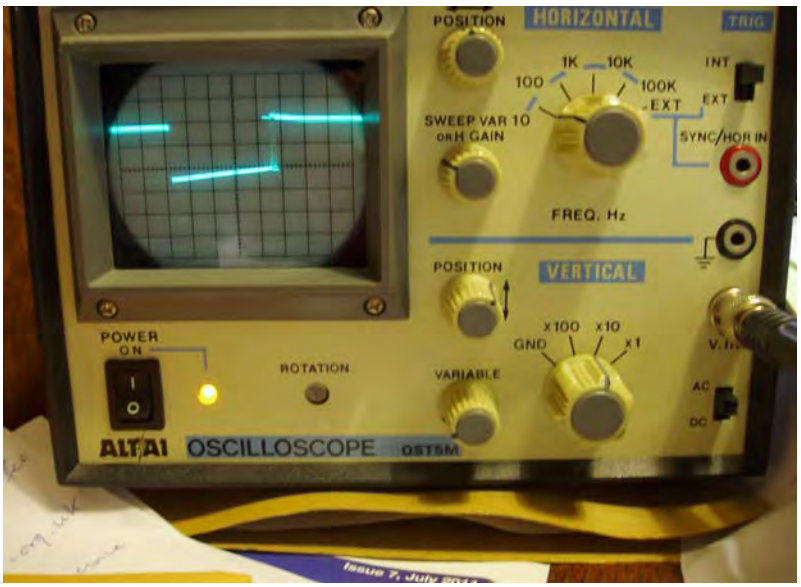


Fig. 6. The 16-01-01-16 scales are the 16 LEDs of the EEG display [5], and the *italics figures are frequencies* in Hz:
LED means a "light-emitting diode", an indicator lamp whose lateral position from screen centre line = signal amplitude at that frequency.
The left half of the screen is for the left brain hemisphere, and the right half is for the right hemisphere.
The Mind Mirror spectrum analyser EEG graphs below were recorded at its maximum sensitivity of 3 microvolts full scale, i.e. LED No 16 lights up at 3 μV (0.000003 volts). The scale is linear: LED 1 is zero volts and LED 16 is 3 μV.
Experiments 1 & 2 are to indicate reproducibility. Experiment 3, for comparison, was just after thinking extraneous thoughts to destroy the image (no image seen).

Oscilloscope Pictures:

Note: These pictures were taken with no audio oscillator connected.

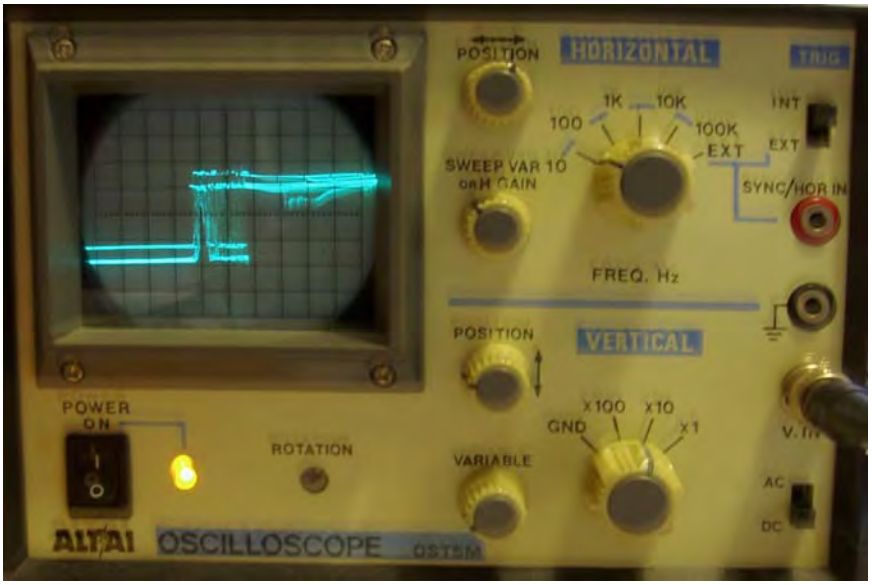


Above picture shows sharp rise & fall of square wave edges, measured at the lamp bulb terminals. The scope happened to be set to "AC input", but the picture below was set to "DC input" and shows a squarer square wave. The vertical DC voltage difference between the two lines below, is 1.5 volts:

The picture below shows the waveform at either side of the 0.56 μF capacitor (on flasher circuit board), showing a sharp rise but a ragged fall. However, the final result across the lamp terminals is all that is necessary (the picture above).

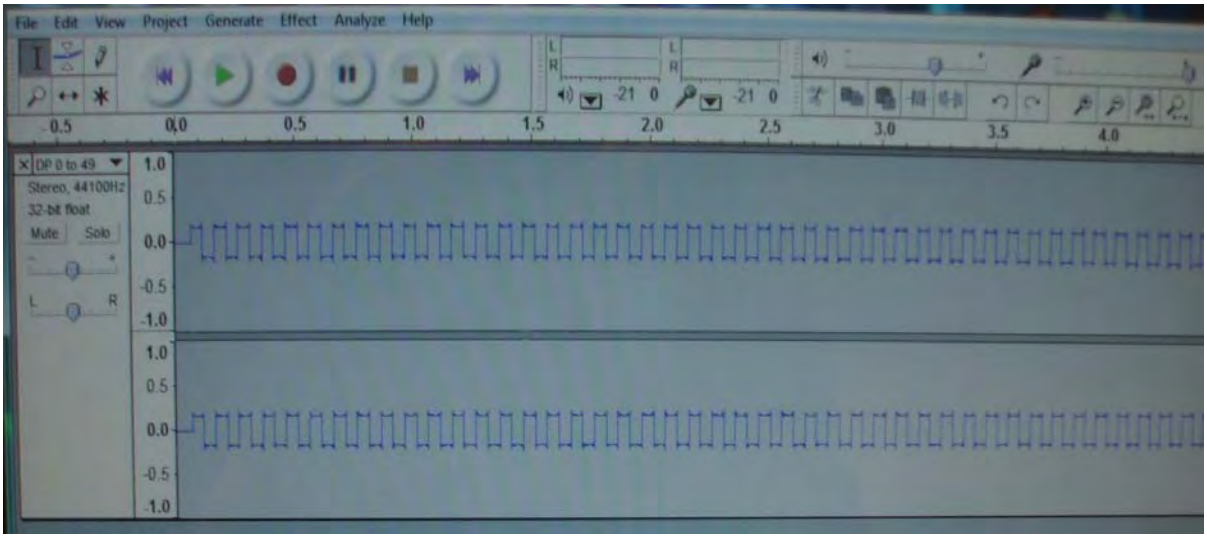
All the pictures **above** all use a "wav" (Microsoft) square waveform.

The picture **below** is across the bulb terminals for that wav file saved as a much smaller **mp3** file, but which has some noise on its verticals: note the vertical multiple starts of the "on" (upper horizontal) line (ignore the vertical jitter which causes apparent double horizontal lines):



Both the wav and mp3 square waves have been tested for vision production, and found successful. The less pure mp3 waveform is ok because the bulb filament cannot follow its fast multiple "on" starts. The advantage of an **mp3** file is that it is acceptable by, and can be copied into, small external recorders like an I-pad or lower cost MP3 digital recorders/players, which allows a cumbersome computer <u>not</u> to be needed during use.

Below, is the "Audacity" programme computer screen picture of the **mp3** square wave referred to just above. This was obtained by converting the wav file to mp3 using a converter programme (www.NCH.com.au/tonegen). Note the small slightly noisy corners of the mp3 square waves. (Cf the similar computer screen wav pictures given above). The MP3 result works quite satisfactorily.



Miscellaneous Technical Instructions & Notes for Use:
For the **essential** main instructions, see Fig. 1.2 in Chapter A(ii).
Caution: See the very last paragraph of this e-book.

See the **Caution** note below, about those who should **not** use flashing light systems.

It is not necessary to have a computer available while using the flashing lights unit, because the output of the USB Audio Device can be copied to any recording device, such as a CD or MP3 player, a tape recorder, or any miniature sold-state recording/replaying device, whose output 3.5 mm jack socket can then be used to plug the 3.5 mm plug-to-plug cable into, with the other end being plugged into the flasher unit's input. The playing device's volume control will need to be adjusted, to get suitable amplitude square waves from it. For the Sansa MP3 player, shown in the picture of the final unit, a few pages above, its half-volume is ok. To find the best level, the MP3 player's volume control was reduced until the bulbs stop flashing, and then increased to about halfway between that value and the maximum. The setting was noted. A suitable low cost MP3 player is Maxell, P-Series, see www.maxell.eu

Power supply unit ("battery eliminator"): Set the voltage on it **before** switching it on (it will **not** respond to changes made after switch-on). Set it to 6 volts to power the circuit board. If the bulbs burn out they are very low cost and easily replaced. All the transistors are in sockets, not soldered in, for easy replacement.

Very Important: It was made **sure** that the two 3.5 mm stereo-type plugs were firmly clicked **fully** into their **correct** sockets (labelled), which may be very stiff.

Note: The earphones' sound volume was set "moderately loud" for effective brainwave entrainment, but **not** "very loud". Recall the caution that earphone and MP3 player manufacturers put in their instructions leaflets – that excessive loudness can cause permanent hearing loss in later life.

Note: In use, the two **brightness** control potentiometers should be set at maximum, just before putting the spectacles on, to get the bulbs about **equally bright**. The brainwave entrainment is more effective if the bulbs are **bright**.
After the visions are observed, at about 10 minutes, with the left bulb turned off (i.e. left potentiometer turned fully anticlockwise), the right potentiometer can be reduced slightly (only about 10 to15 degrees of rotation) to further reduce the distraction of the flashing, but too much reduction will cause the brainwave state to be lost, but it can be recovered by turning the flashes brighter again (without delay).
The flashing should quite soon become habituated to, and then appear as a slight flickering only. Surprisingly, after the trees or other vision has been observed for several minutes and if one is relaxed, then if the right bulb is turned fully bright (potentiometer turned fully clockwise), the images become more vivid and the flashing is not a distraction. Experimentation is necessary.

If extraneous thoughts occur, the flashing habituation will cease and the field of vision will be blocked out by a red field of light. The trees are "behind" this light and if the mind is cleared of thoughts, the flashing will be re-habituated and it will then diminish and the trees will re-appear, within usually 10 or 20 seconds. This effect is repeatable. With practice, it should be possible to do simple arithmetical calculations without losing the trees vision. This effect is very similar to a ticking clock in a quiet room, which the mind habituates to, so that no ticking is sensed, but if one thinks of the clock then its ticking will be heard again because the mind's habituation to it is lost.

Other experiments (not yet done) would be to change the flashing mark:space ratio, i.e. the ratio of on-time to off-time for each flash.

Note: It is essential to wait 2 minutes before assessing the success of the settings, if the flashing seems too bright and blocks out the images, because the eyes/brain will habituate to any repetitive stimulus like regular flashing, and it will recede, leaving the images to be seen. A good familiar example is the ticking of a new clock in a room, which is quite distracting at first, but after some time becomes quite inaudible and is not distracting at all. The same applies to flashing lights and time must be allowed for habituation to occur before assessing the imagery situation.

Note: Very different degrees of success may be obtained on different days, depending greatly on one's relaxation state. A week of results with good images may be followed by weak images, but good images will be obtained again later, due typically to one's mind state – e.g. stress or worry can cause a period of weak imagery. Patience is necessary.

The order of switching on, does not matter, electronically, but is best to switch on the square wave from the computer (or preferably from a recording of it on an MP3

player) last, by using the "pause" button on the MP3 player, to avoid loss of the start of the programme. For the same reason, the 6 volt LES bulb brightness was set to maximum before starting the MP3 player, and was thus set to be of equal brightness before putting the spectacles on.
Note: It may take about 30 seconds for the bulbs to start flashing and 30 seconds for the sound pulses to settle down steadily.

Circuits have been tested and the diagrams checked, but please report any errors found, to the author: mgh@4-D.org.uk
Please report any results and problems.
The author will endeavour to reply to any questions.

Future research:

(1) The author has tried using a telephone pick-up coil to find out if magnetic field pulses would allow reducing the flashing brightness required, while still obtaining the images. The pick-up coil was heavy enough for its lead to drape over the head and hold the coil at the left occipital region, without a head-band. This is very experimental and the results are not sure, as there may be an effect like the placebo effect for medicines, i.e. a beneficial effect may be imagined. The pickup coil with a 3.5 mm mono jack plug (Maplin Part No LB92A) was plugged into an additional jack socket which is connected between the points A & B in the main Circuit diagram above. Magnetic field measurements show the field at its rubber cup is 100 milli-Gauss (measured with a 50 Hz calibrated Gauss meter). Applying a notional safety factor of 10 to correct for an actual frequency used of 6 Hz, this could be 1 Gauss. Safety information is given below:

From: http://sp.ehs.cornell.edu/lab-research-safety/radiation/magnetic-safety/Documents/Magnetic_Field_Safety_Program_Cryo_Guide_v4.pdf

Information from Intl Radiation Protection Association, IRPA:

At 1 Hz to 300 Hz, exposure to magnetic fields should not exceed:
(600/f) Gauss, where f = frequency.
So for a frequency of 6 Hz (theta wave frequency), this is 100 Gauss.

The field at (touching the rubber cup of) a typical telephone pickup coil (used to record phone conversations by placing on the phone handset) is only about 1 Gauss (see above), which is well below the IRPA safety level recommendation.
For comparison, holding an electric drill gives about 10 Gauss, and using a hair dryer or vacuum cleaner is similar.

(2) Varying the mark:space ratio during actual use, could be worth investigation.

(3) The final flashing into one eye is far less distracting than if into both eyes, but the possibility is being investigated of further reduction by only applying the final 6 Hz as electrical impulses to electrodes at the inion and vertex (reported by Kanai [10] to produce phosphenes). For this, electrodes are connected to points A & B in Fig. 5a via a potentiometer and a simple amplifier (e.g. Velleman 7W mono audio amplifier

module, VM114, 20 Hz to 20 kHz, or better, Velleman K8060, 3 Hz to 200 kHz), adjusting the potentiometer upwards from zero for safety. Phosphenes and magnetic effects have been reported in many papers by Cohen Kadosh et al [11].

Final Note -- Safety:

Some L&S machines, including the D.A.V.I.D. 'Paradise' (DP) unit, are pre-programmed to slowly bring the user back to normal Beta, for safety reasons (see the L&S Caution note below) to return the user to a normal brain-state. But this was not wanted during the specific experiments described above, so (using the DP machine) as soon as an increase in flashing frequency was noticed, the unit was switched off, using its slow switch-off feature, or, by very slowly removing the L&S spectacles and any earphones. This allows the brainwave state to be retained for a while. Then the Light & Sound unit was then set to a long Ganzfeld programme (or the room lights were switched on and with closed eyes a satisfactory low-level uniform Ganzfeld-type illumination was then obtained). Relaxing with eyes still closed, avoiding extraneous thoughts (important), after a long time -- about half an hour -- I was sometimes be able to visualise a corridor which I could move down, and at the end, I could visualise a window viewing onto a garden, or onto a path between bushes. Or, I could simply imagine I was in a room with a small window with a garden outside, with bushes in it. A small window is easier than imagining the whole field of view is filled with bushes etc. They appear colourless, and it was sometimes possible to passively visualise sunlight increasing to make them green. It would become green, but only for a few seconds, and practice is needed to prevent it reverting to colourless again.

The low-cost "recommended" DIY circuit given above produced the same visionary result as the DP L&S machine, but I had put no ramp-up square waves at the end, so if this is used, a user should (after the session, for safety) use a higher flashing rate to get out of the low frequency brain-state, at the user's own discretion, by creating a ramp-up programme as described above – any frequency regime programme can be created using the computer as explained above. See the Caution below. The writer can take no responsibility for any effects produced, and if in doubt, professional advice should be sought. The above is not a recommendation to use any of the circuits described; it is just a descripton of what the author did.

CAUTION: When using Light & Sound devices:

NOTICE: For legal reasons, the following statements are made. The items described are experimental consciousness-enhancing products, for which no medical claims are made or implied. The descriptions given are reports of the effects produced as given by the manufacturers and by professional users. None of these statements by professionals should be construed as medical claims. The claims made centre around relaxation, meditation, hypnosis and learning.

Warning: Light & sound and CES units should not be used by persons with a history of epilepsy or other neurological disorders. But the following finding is quoted, for information, from Maxwell Cade & Coxhead [2]**:** "After 4 years use of the lights, with more than 4000 pupils including 25 known epileptics, there have been no mishaps, and most of the epileptics have reported a marked improvement in their condition. ...subjects were only exposed to the lights after they had become very relaxed..." (see page 49 *loc cit* for more details). This is quoted for information only and our advice is that medical advice should be obtained before proceeding in such cases.

Note: Epilepsy is not very common, but it is possible for someone to be an as-yet undiagnosed epileptic.

The author followed the advice below, which is copied here for information only. It is **not** a recommendation for anyone else to repeat anything related to flashing lights &c described in this book:
It is essential to allow at least half an hour after using light and sound machines and other mind-enhancing units and tapes before operating machinery or driving a car. Feel the chair and floor beneath you, get up and walk around and have something to eat and drink. Eating and drinking is the quickest and safest way to close down the doorways to the imagination or to unknown "inner worlds" after an inner exploration.
No responsibility is accepted for any use of light & sound machines, nor if any of the above information is used. **Important:** See Warning on last page (page 188).

REFERENCES for Appendix 3 only:

Reference numbering in the Appendix 3 text above, and in the list below, is for this Appendix 3 only. The main references for Chapter A (ii) are after Appendix 5 below.

1. Voss, U., et al, (2014). Induction of self awareness in dreams through frontal low current stimulation of gamma activity. *Nature Neuroscience*, DOI 10:1038/nn.3719.

2. See in C. Maxwell Cade & N. Coxhead, "The Awakened Mind", Element Books, UK (1989): RECOMMENDED READING.

3. Comptronic Devices Ltd, Edmonton, Alberta, Canada. Web reference: www.mindmachine.com/proddetail.php?prod=DP-DPXL (not investigated). Now called Mind Alive Inc, Edmonton, Alberta, Canada. Web reference: www.mindalive.com/manuals/delight_pro_manual.pdf

4. M.G. Hocking, "World Religion & History back to 70,000 BC, Discovered by Remote Viewing", published by 4-D Books Ltd, London: www.4-D.org.uk/Books See its Appendix 8. See more details on next page here below (page 79).

5. Mind Mirror EEG internet references (2014):
www.mindmirroreeg.com/w/equipment/mm1and2.htm
www.mindmirroreeg.com/w/GeoffreyBlundell.htm
www.mindmirroreeg.com/w/MaxwellCade.htm

8. Left to right cross-over is somewhat complicated.
Experiments with people who have had the link cut, between their left and right brain hemispheres have found bizarre results on what objects placed in view of the R or L eye only, are reported as seen by the right and left eyes [9]. Such patients were shown a long horizontal row of lights which were flashed for 0.1 seconds but they reported seeing lights flashing only in the right half of their visual field. When the lights were flashed only in the left half of their visual field, they reported seeing no lights. But when they were asked to point to the lights that had flashed, instead of giving a verbal report, they gave a correct report of the left field flashing lights! This effect is because the speech centre is in the left brain hemisphere. There are other stranger effects, beyond the scope of this article.

Reverting to normal people, the left and right fields of view of each eye separately, go to the right and left brains respectively; i.e. reversal occurs for

each eye separately. Relevant to flashing lights spectacles, see United States Patent 5709645, by D. Siever, in: www.google./com/patents/US5709645

.

If the field of view seen by each eye is limited by the nose, for each eye, as when using flashing bulb spectacles, then from data in reference [9]:
LEFT eye left field of view goes to R brain
LEFT eye right field of view goes to L brain

RIGHT eye left field of view goes to R brain
RIGHT eye right field of view goes to L brain

(Note: lateral inversion occurs in each eyeball due to its single convex lens.)

So an obvious experiment is to reverse the positions of the two bulbs nearest to the nose, when using the LES (Lilliput) 4-bulb spectacles described in the present author's article "QUICK METHOD FOR OBTAINING VISUAL IMAGES". Then, both bulbs over the left eye will flash to the right brain, and, both bulbs over the right eye will flash to the left brain. Also, another experiment, should interchange the outer two bulbs instead. The results are not yet known.
Note added after the above was written: Preliminary tests by interchanging the two bulbs nearest the nose, produced no visions of trees etc.

9. M.S. Gazzaniga, Scientific American, August 1967, p. 24.
See also: D. Deutsch, Scientific American, October 1975, p. 92.

.

10. Ryota Kanai, R., Chaieb, L., Antal, A., Walsh, V. and Paulus, W. (2008). *Current Biology,* 18, 1839–1843. DOI 10.1016/j.cub.2008.10.027

11. Terhune, D. B., Song, M. and Cohen Kadosh, R.(2015). *Cortex*, 63, 267-270. https://cohenkadosh.psy.ox.ac.uk/publications/base_view?b_start:int=25&-C

The author:

M. Gwyn Hocking is a Professor of Materials Chemistry (University of London). In his latest book he has included detailed discusssions on ESP ('remote viewing') investigations of the fine structures of molecules, atoms and elementary particles:

"World Religion & History back to 70,000 BC, discovered by Remote Viewing".
(400 pages hardback, with many illustrations)
See Chapter 3, & Appendices 3 to 6.

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info@4-D.org.uk about extra postage cost if outside the UK.

APPENDIX 4: OTHER APPLICATIONS

Remote viewers report that people have been successfully trained for remote viewing [18-28]. The image-producing method described here may be a useful practical start for remote viewing training, as it produces immediate images and a relaxed brain-wave state.

Possibilities of 'remote viewing' in many fields including government-funded surveillance groups, requires entry into the brain states shown in Fig. 3 & 4. A paper published in Nature [17] showed, in laboratory conditions, in ten experiments on dice shaken in a closed steel box, that remote viewing gave the correct answers in 8 cases, with the other two cases being a "pass" (no answer given); the probability of this result occurring by chance is 1 in a million, which proves acquisition of information from a source beyond one's normal view, i.e. a type of remote viewing, is beyond reasonable doubt, for the suitably gifted observer.

Remote viewing is based on a very rare special ability or innate 'gift', and so it cannot satisfy the usual requirement in science that a valid observation should be immediately "repeatable by anyone, anywhere". This requirement causes problems in securing the publication of such information, but it seems illogical not to publish such admittedly anecdotal information if it can never be obtained by other methods, provided that it is clearly stated that it is anecdotal. An example is the reported use of a magnifying ability by some remote viewers, which has been claimed to reveal fine structures of subatomic particles, which can never be observable by microscopes due to their resolving power limitations [12, 18, 31]. Such data may be useful for future researchers. The difference between this and the above example of dice in a steel box, is that the box can be opened by anyone to verify that the dice are as predicted by the remote viewer, but the subatomic particle structures cannot be viewed "by anyone" to verify them, but only by the four known remote viewers reporting on these particles [18, 31].

Observations made by remote viewing have been successfully used by several government intelligence agencies, such as the CIA remote viewing group: Schnabel [19], Swann [20], McMoneagle [21-23], Targ [24], and Morehouse [25-28]. McMoneagle was awarded a Congressional Medal for his services. Admiral Stansfield Turner (US Navy), founded the CIA remote viewing group, soon after becoming Director of the CIA in 1977. Its activities were publicly reported then, but it later submerged from public view.

Ingo Swann demonstrated his ability to a group of science professionals in London forty years ago [29], just before joining the CIA remote viewing group in the USA. One of us present, provided an electronic random number generator and Swann repeatedly correctly gave its readout, before anyone saw it, under carefully controlled conditions [29]. But of course none of us present was able to reproduce his results, as we had no remote viewing ability. Ingo Swann is able to (verifiably) view remote events anywhere in the

world, and he became a main member of the USA government CIA remote viewing group (Schnabel [19], Swann [20]). Remote viewing ability is either innate (Swann [20, 29], Morehouse [25-28], McMoneagle [21-23]), or it can be acquired by training, as discussed by these and by the present author [12, 18, 31].

Other methods for entering imagery states are available, e.g. a new method for lucid dreaming requiring no sensor at all in contact with the sleeper [30].

REFERENCES for all of Chapter A (ii) except its Appendix 3 above.

1. Voss, U., et al, (2014). Induction of self awareness in dreams through frontal low current stimulation of gamma activity. *Nature Neuroscience*, DOI 10:1038/nn.3719.
2. M.S. Gazzaniga, M.S. (1967). *Scientific American*, page 24-29.
3. Mind Mirror EEG internet references (2014):
   www.mindmirroreeg.com/w/equipment/mm1and2.htm
   www.mindmirroreeg.com/w/GeoffreyBlundell.htm
   www.mindmirroreeg.com/w/MaxwellCade.htm
4. Maxwell Cade, C., & Coxhead, N., (1989). *"The Awakened Mind". UK:* Element Books.
5. Mouni Sadhu (1962). *"Concentration".* London: Allen & Unwin.
6. Parsons, D.. *"Dorje Ling"*, CD: Fortuna 17076-2; Tracks 1 (& 4). See reference [35] below.
7. Comptronic Devices Ltd, Edmonton, Alberta, Canada.
   Now called Mind Alive Inc, Edmonton, Alberta, Canada. Web reference:
   www.mindalive.com/manuals/delight_pro_manual.pdf
8. Available from Ready Spex, UK. Cost £3.
9. Siever, D. (20 January 1998). *US Patent 5709645,* (available free from a Google search).
10. Ryota Kanai, R., Chaieb, L., Antal, A., Walsh, V. and Paulus, W. (2008). *Current Biology,* 18, 1839–1843. DOI 10.1016/j.cub.2008.10.027
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    https://cohenkadosh.psy.ox.ac.uk/publications/base_view?b_start:int=25&-C
12. Hocking, M.G. (2011). *"World Religion & History back to 70,000 BC, Discovered by Remote Viewing"*, 400pp. London: 4-D Books Ltd:
    www.4-D.org.uk/Books See also ref. 31, below.
13. Harman, W.W., McKim, R.H., Morgar, R.E. and Stolaroff, M.J. (1966). *Psychological Reports*, 19, 211-227.
14. Strassman, R. (2001), *"DMT".* Rochester, Vermont: Park Street Press.
15. Shannon, B. (2010). *"The Antipodes of the Mind". UK:* Oxford University Press.
16. Callaway, J. (1988). *Medical Hypotheses*, 26, 119-124.
17. Targ, R. and Puthoff, H. (1974). *Nature* 251, 602-607. See also the Stanford Research Institute four videos (about 8 minutes each) on Remote Viewing at:
    www.remoteviewed.com/remote_viewing_history_sri2.html

Chapter A (ii) REFERENCES (continued)

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Available from 4-D Books Ltd, London at:
www.4-D.org.uk/Books (400 pages, hardback with 58 illustrations).
£6 + mailing within UK.

Enquire (separately) from: info@4-D.org.uk
about extra postage cost if outside the UK.

-o0o-

"**Stop Press**":
Important note, added from the end of the "**Mechanism**" section of Chapter A (ii):

During a vision of trees etc, the author found that if the brightness of the flashing lamp at 6 Hz is increased, then the intensity of the images increased, even though the brighter flashes intruded into the vision. As a speculation, this may indicate that DMT production by the pineal gland, which is known to be caused by stress [ref. 14, above], may be increaseded by increased flashing brightness, as the pineal is (albeit circuitously) connected to the eyes. Anecdotally, the pineal gland has been called the "third eye". It is dormant in most people, but it may be a "sixth sense" sensor, if activated.
See the **Mechanism** section in Chapter A (ii).

Chapter A (ii) Appendix 5

Comments made by the present author (MGH) on comments of referees/reviewers on the rapid visualisation method

Many psychologists and neurologists in recent years are intent on trying to show that experiences resulting from devotional pursuits such as meditation, and even consciousness itself, are just caused by neurological activity in the brain, and there is nothing beyond this. This is a popular materialistic/atheistic/humanist type of view.

Readers may be interested in the attitude of some psychologists to Chapter A (ii), when it was sent as a paper to publish in a network of people with scientific interests, many of whom also have an interest in the nature of consciousness etc, for their magazine (which is sent only to their closed membership, not published for public access).
I had thought the important new experimental results would be of great interest to those members with an interest in meditation, and for entering intuitive states of importance for invention in science and technology.

But instead I was surprised to be met with what could be described as a strong wish by some reviewers to suppress these new results.

There are some psychologists who believe that there is no consciousness beyond the brain, and this forms their personal opinion of what the world 'should be' like, according to them: a popular materialistic / atheistic "world view". In some cases, their belief takes on an almost religious fervour!
They would have no interest in possible ways to visually observe non-material regions, perhaps in other dimensions, normally unseen, as these could destroy their own strongly-held "world view", if seen to exist. The disappointing aspect of this attitude is their wish to prevent others from reading the new method described here, depriving those interested in such possibilities:
There are many readers who do not share such referees' views. They are being deprived of papers on which a referee may have strong personal contrary views, and on which he may make faulty interpretations.

Examples of this strongly-held attitude are even found in popular newspapers, where they dismiss reports of "near-death experiences" (NDEs) as being due to anoxia (oxygen depletion) in the dying brain, creating hallucinations.

But they just ignore the very many reports by such patients who survive and are resuscitated, who tell what they perceived in their near-death state – e.g. many report being able to see or perceive events in the corridor outside the operating theatre where they were located, while

unconscious, which were subsequently verified but which could not possibly have been seen by the patient.

Many psychologists think that all "visionary" experiences can be explained by a materialistic psychology: neurological activity within the brain.
If anything contrary to this strongly held belief is reported, many of them attempt to suppress it. They are NDE sceptics.
Their "world view" is so fixated that they cannot bring themselves to admit that NDEs could be that the patient's consciousness could separate from his/her body and travel outside the room etc, and observe events there.
Their whole "view of life" or "world view" would be destroyed if, for example, NDEs were actual external experiences of views seen in and from another spatial dimension.

Many psychologists believe that consciousness is within the brain, and that there is no "soul", nor any "higher realms" or spatial dimensions, such as those reported from NDEs, and therefore they believe that NDEs are just hallucinations generated by brain anoxia.
If a referee/reviewer of a paper has strong beliefs like that, he would have no interest in (pointless!) meditation methods, and would have a tendency to try to 'explain' and dismiss my observations of trees as due to blood vessels in the eye (2 referees), without even ever trying out the method !

The author's method is of course quite independent of one's views on the mechanism involved, such as one's own personal belief on whether consciousness is an aspect of brain function only, or is based elsewhere.

Anoxia is also caused by the restricted breathing exercises of yoga, which increases CO_2 levels in the blood and can cause "CO_2 narcosis". CO_2 narcosis is reported by submariners. CO_2 is a known narcotic.
But narcotics can cause the perception of normally-subliminal sensory inputs to be perceived – see how, in the important section headed "Mechanism" in the rapid visualisation Chapter A (ii), above.
That chapter reports new *experimental* results, of an astonishing nature; it cannot be dismissed as being just an "opinionated" *discussion* article containing no new experimental results.

Genetic brain chemistry differences explain why some people have a "natural gift" of being able to visualise, while many other people see only blackness, when they close their eyes. This is explained in the section called "Mechanism" in Chapter A (ii). 'Brain chemistry' does not prove that the visions are manufactured in the brain!! It can raise sensitivity to a "sixth sense" which is normally dormant/subliminal, allowing ESP perception.

The new method described in Chapter A (ii) reduces the genetic difference between people who can, and cannot, visualise naturally.
The advantage of this method is that it gives early encouragement to meditators, especially beginners, who otherwise find they are making no progress, and just give up:
For many years, the author had tried traditional meditation methods, but made no progress. Not even a candle could be visualised with eyes

closed (ignoring the irrelevant "after-images" or phosphenes, which anyone can get). This discouragement makes many people give up with meditation.

The results reported are of great importance to those, like the author, who have spent years trying to obtain visual imagery by conventional meditation methods but with no success.
I have always seen only blackness, with eyes closed, and I have been searching for years for a method for obtaining visual imagery, which I finally obtained by the (fast) method described, never published anywhere else.

Chapter A (ii) gives these entirely new important results, which will interest many readers, so when it was sent as a paper for limited publication as mentioned above, I was very surprised by one referee's dismissive comment, "It may possibly have a kernel of value"!
He had not appreciated the importance of the results, but I do admit that people who are not interested in meditation methods, nor in possible ways of increasing one's intuitive inventive ability, would not be interested in the paper.

The author has published 150 scientific papers, and has never before had new experimental results rejected! There may be grounds for rejecting a theory or an "opinionated" discussion paper which has no experimental results, if it is judged by referees to be a scientifically unsound discussion, but there can never be a valid reason for rejecting experimental results.

The visualisation method in Chapter A (ii) is new experimental results, with the subject's experimentally-induced mindstate also being verified experimentally by electroencephalograph (EEG) studies, and yet it was dismissed and its publication rejected by several referees when the author sent it to a private network with many members interested in meditation etc, in advance of its publication worldwide here in this book.

Comments by two referees included trying to dismiss the observations of trees by saying that the author was probably seeing the veins in his retina! The author is aware of what these veins look like, from retina photographs, and is aware of what trees look like, and there is no way that the images observed were veins! Some reviewers may allow a prejudice caused by their strong views about what is not possible, to influence their decision. If a reviewer ignores the other visions reported, of grey stone-walled houses, and of a town seen from a height, as well as another observation of tree branches waving about vigorously as if by a wind, then it is unreasonable to dismiss such visions as blood veins in the eye!
The only way to allow strongly-held opposing views of what the visions are, is to ignore the evidence.

Also, such visions cannot be dismissed by saying they are due to brain anoxia, as they are obviously not, in a normal healthy observer.

The actual inane comment made by one referee is, "*My guess is that his trees/branches imagery actually relates to the capillary architecture of the eye."* But he is completely wrong in 'guessing' that the images seen are the capillary structure of the eye, without even trying the method out! I am absolutely **certain** that it is **not** the eye capillaries. What were the stone-walled houses?

Such comments should not be allowed to deprive others from reading these observations, especially as they is important not only for meditators but also for those interested in **invention** in **science** & **technology** to be able to easily enter an intuitive state to facilitate invention and new ideas. The paper is not confined only to those interested in meditation methods.

I was very surprised that a report of *experimental* results should be rejected, on the basis of the unconfirmed beliefs of referees -- it suggests that the report was dismissed because the referees concluded (incorrectly) that I saw only blood vessels in the eye, and not the scenes involving trees etc which I described! Also, only **one eye** receives the flashes during the highly stereoscopic visions of trees, and the **other eye** receives no light at all. So **stereoscopic** vision of the blood capillaries in the eyes is impossible! **Two eyes** are required, and, the trees moved steadily across my field of view, accurately stereoscopic, and, the direction of motion was reversible, or stoppable, at will.

It took me hundreds of hours of careful development to *optimise* my (freely-available) circuits to a standard which any non-technical person with some practical dexterity could easily make, with no need to understand the circuit operation. Hence these results are reported in this e-book instead.

Also for another reason, it is difficult, to see why an "experimental results" paper should be rejected**:** many people think that even experimental papers which report only negative results should be published (to stop others from wasting time by repeating non-productive lines of research).

Relation to invention and intuition:

The completely new method given, puts one quickly into an intuitive simultaneous beta and delta brain-wave state, with implications for invention (*Cf*. Edison & Einstein), quite independent of what mechanism the user believes is involved.

Any views relating to mysticism and consciousness are irrelevant to the important technological aspect of this method in relation to its use to quickly and reliably reach an intuitive state in which inventions can be brought forward into the normal waking state. This is due to the essential need to link together delta, theta, alpha and beta.

In my professional life as a professor of chemistry, I suggested courses on ways of enhancing intuition, to facilitate invention, but the only thing that other senior staff would consider was academic excellence, and they did not see that intuition has any importance! Attempts are needed to train and develop the intuition of students, and an understanding of its importance for invention technology.

I had hoped that referees of the paper might take a different view, but they did not consider this important technological aspect at all. Unless they happen to be involved in industrial research & development, it would probably not occur to them, if they are psychologists. It will take decades before the importance of intuition to industry is recognised, although Edison had demonstrated this a century ago, but he did not publicise his method.

Some other specific referee's comments (in italics):

"*That one can generate images using electronic techniques -- yes. But also the "God helmet" ((see ref. 32)) can generate so called spiritual experiences. Visions are cheap and can be generated by many electrical or chemical methods. But they may have nothing to do with meditation. This is a very topical subject, as many neurologists today are trying to show that all religious experiences can be explained/generated by neurological activity".*

My comment:

It is an assumption to say that he "God helmet" of Persinger [32] generates spiritual experiences -- an alternative view is given in the section called "Mechanism" above:

it can be said that the "God helmet" can "generate so called spiritual experiences", but, it could instead equally be said that the God helmet "can put the brain's receptors into a state in which they perceive what are normally un-perceived subliminal inputs". I agree that *this is a very topical subject, as many neurologists today are trying hard to show that all 'religious experiences' can be explained as being simply physically generated by brain neurological activity.* Do I detect some prejudice here?!

His assertion: "*visions are cheap*", is untrue if drugs are excluded! No drugs were used by the author and so it is quite inappropriate to cite drug use in a referee's comment. I specifically wanted to give a non-chemical method -- no drugs!

I am not aware of any electrical methods (other than those producing vague cloud-shaped phosphenes, which are primitive, and nothing like the sharp imagery which my method produces).

Other electrical methods such as stroboscopic lights produce geometrical patterns generated by processes within the brain, which are nothing like the visions of forests etc produced by the method reported by the author.

His statement, "*many neurologists today are trying to show that all religious experiences can be explained/generated by neurological activity*", indicates that his sympathies lie with a materialistic/atheistic "explanation".

It is disappointing to read another comment by another referee, "*Formulae and diagrams will be Greek to most of our readers",* which seems very unscientific! I have never seen such a referee's comment anywhere else, and if a referee is in another field he should return the paper to the editor and say it is outside his field, and not make ignorant comments!

A referee said, "*He should remove ALL his Christian nuances -- he is entitled to them, of course, but religion has no part whatsoever to do with the experiment, and should be kept well out of it".*
My comment: This is a typical materialist / atheist comment on my (true) observation that if I put myself into a devotional frame of mind, the vision did lighten up. I was not trying to propagate Christianity! Devotional thoughts are common to all religions and even an atheist is able to put himself into a devotional state for a short time.
I agree with his comment, "*religion has no part whatsoever to do with the experiment*", but he misunderstands my meaning; devotional feelings definitely do have an effect on the vision, not 'religion', and this referee is making comments without even having tried to repeat the experiment:
I did give an example from a devotional Christian hymn, but I followed it with, "Any devotional music from any other religion would be suitable and this is not an attempt by the author to "push" Christianity."

(Personally, I am equally attracted to Buddhism, and I reject the notion that Christianity is the only true religion and that Christ is the 'only' Son of God, which is due to a mis-translation of the word "unigenitum" in "filium suum unigenitum" in a gospel, wrongly translated as that Christ is the "only" Son of God. But "unigenitum" or its Greek equivalent "monogene" means "single genetic" or "one parent", and the Latin word for "only" is "solus", not "unigenitum" [12].)

Another referee's comment:

"*I've also experienced vividly stereoscopic tree branches floating past me as I "flew" over them in lucid dreams. I think the author is probably being drawn to the borderline of a dream state by his procedure and hypnogogic mechanisms are coming into play, the very arena in which lucid dreaming can readily occur. It would enhance his paper if the author could cite some of this literature."* -- a referee's comment.
I agree with this (rare) positive comment ! But I was not in a dreamlike state – I was fully wide awake (high beta brainwave) but also unusually with high delta and some theta.

Another referee's comment:
"*This is far too technical - the opening page would put most readers off, I think. Even when it gets going in ordinary prose it is not made clear what the article is all about, what issues it addresses, or even what is meant by 'visual imagery', a phrase which can be taken in various ways. And the main text is scattered with formulae and diagrams which will be Greek to most of our readers."*

The author has now modified the text to introduce the subject better, but the comments that "*formulae and diagrams are Greek …"*, is just inane, and so none of these have been modified in Chapter A (ii) here.

Some inaccurate referee's comments:

"*(1) It doesn't seem easy to reproduce".*
My comment: Actually it is very easy -- the process is automatic and visions just appear. So I'm not sure how this comment was thought of?

"*(2) The long-term effects of stroboscopic lights: No adverse comments (excluding possible epileptic effects, which are cautioned against) have appeared in the literature -- if any are known, please tell me where."*

My comment: The paper does include this statement:
Warning: Light & sound and CES units should not be used by persons with a history of epilepsy or other neurological disorders. But the following finding is quoted, for information, from Maxwell Cade & Coxhead [2]**:** "After 4 years use of the lights, with more than 4000 pupils including 25 known epileptics, there have been no mishaps, and most of the epileptics have reported a marked improvement in their condition. **...** subjects were only exposed to the lights after they had become very relaxed..." (see page 49 *loc cit* for more details). This is quoted for information only and our advice is that medical advice should be obtained before proceeding in such cases.

My additional comment: I have not heard of any other adverse effects in the decades since Cade used flashing lights on his 4000 pupils, but admittedly there could be some, not known to me. The paper is written as what the author did, and it is mentioned that it carefully avoids being a set of instructions for others to use. It just describes what the author did and observed.

(3) "*I am not sure that meditation involving visualisation is an end in itself, but a means to something else. There's some confusion about whether the electronic technique applies to meditation"*
My Comment: In my paper I do not say that visualisation is "an end in itself"**;** I had included the sentence, "The above trees vision is only the beginning – one must slowly be able to thin out the trees and create other visions of one's own choosing – likely to be a long process, but **this method is a valuable starting point for pathworking [7] and advanced meditation**."

In my Figures 1 to 3, I have shown reproducible EEG spectrum analysis of experimental results which a stroboscope produces, with simultaneous symmetrical beta, alpha & theta, just like with advanced "standard" meditation methods. Such EEG patterns allow the imagery of the dreamlike theta state to be perceived by the waking mind (in the essential simultaneous beta state).

(Apologies for some repetitions in the texts above.)

A final comment: I am reminded of a statement by Lao Tzu:
He who does not know the truth, is ignorant,
But he who, knowing the truth, calls it a lie, is criminal ! Tao Te Ching

E.g.: a "*truth*" here is that NDE patients have accurately described *subsequently-verified* events which occurred in rooms outside the room that they were lying unconscious in, in hospitals. This is not mentioned by those who wish to attribute NDEs to hallucinations caused by anoxia.

APPENDIX 6: A low-cost MP3 player: Maxell P-series

SETTING UP: These are the instructions set out as a checklist for the author to follow. There may be minor differences in (e.g.) the exact locations of switches & sockets on the box containing the circuit board.

CAUTIONS:
(1) The jack plug & earphone connectors may be very stiff – if so, ensure they are fully pushed in hard (a click is heard) – if only part in, the voltage to the lamps might be shorted out, if the spectacles jack plug is not fully in, and the output transistors overheat. Look carefully at the jack socket and ensure the plug is fully in.
It is advisable to leave the spectacle jack plug in – no need to remove it.
(2) Check the power supply unit is set to 6 volts (preferably no higher).
(3) Read Chapter A (ii) on this fast method for visual imagery, and its Appendices 2, 3, 5 & 6, before starting.
(4) See especially Fig. 1.2 and its instructions.
(5) Check that the left potentiometer controls the **left** eye lamps, and at the start both potentiometers should be fully clockwise.
(6) Read especially the caution about epilepsy.
(7) Read all the instructions here below. Caution: See the very last paragraph of this e-book (page 188).
IMPORTANT: Before starting, it is essential to familiarise with the Maxell P-Series MP3 player (cost £20 in 2015, from Maplin), or any other MP3 player used, as this needs to be operated while wearing the L&S spectacles. This was done first, as an entirely separate operation – using the instructions in the Sub-Appendix below, called MP3 PLAYER FAMILIARISATION. Important to do because the MP3 player needed to be operated in the dark, but fortunately the Maxell P-Series MP3 player has only has 3 control buttons.

The spectacles' jack socket is the ONLY socket on the SIDE of the box, and the earphones' socket is (approximately) diametrically opposite it, next to the two potentiometers: see Fig. 7 in Chapter A (ii).
Plug the spectacles into the jack socket for them, and plug the earphones into the jack socket for them. Do not put these on yet.
IMPORTANT: Do not plug anything except the spectacles' cable, into the spectacles' socket.

IMPORTANT: To check that the power supply is set to 6 volts and that the "power-in" connector plug polarity is TIP +ve. See markings on the tip itself, or check polarity with a voltmeter. If the tip gets detached from its receptacle (on the black twin cable), re-connect observing the correct polarity markings. Reverse polarity will destroy the transistors {a diode needs to be included in the circuit (power supply line) to prevent this – see layout circuit diagram in Chapter A (ii) Appendix 3}.
The power-in plug will only fit into one of the sockets on the unit.
DO NOT SET THE VOLTAGE TO OVER 6 volts, for normal use (7.5 volts is possible to get a higher brainwaves' "drive", optionally).

Only then, plug the "power-in" plug into the power-in socket. The mains adaptor can be left plugged in, and the "power-in" connector used as a convenient local "switch" to power the L&S unit on or off (pull it out).
The 8 lamps should glow (set the two red potentiometers to maximum).
See the lamp spectacles in Fig. 8 in Chapter A (ii).
Preferably don't leave the system in this state (all 8 bulbs full on) for long periods (i.e. for more than a few minutes).

The two switches on the other (narrow) black box are for the right-side lamps, and one switches off the two outer bulbs, and the other switches off the other two bulbs. Test these switches, and then leave both in the ON position.

Proceed now to the operation instructions (below) for the MP3 player:

Operation of Maxell Series-P MP3 player with the main L&S device:
Plug the short lead with stereo jack plugs on each end, into the Maxell MP3 player and into the square wave input socket on the L&S device (on opposite face of the box from the earphones' socket).
Navigate to Track 1 (music), first, using the procedure explained in the Sub-Appendix below. The only other 'music' track is the square wave for the flashing lights.

Note: It is important to start from the very beginning of the square wave audio, because it quickly begins to start ramping to different frequencies. Starting with the music track makes this easy to achieve, without any haste being needed. Changing then to Track 2 **from Track 1** ensures that Track 2 (square waves) starts from its **beginning**.
Now put the earphones on, observing the letters R & L written on them.
Switch on the MP3 player as explained in the Sub-Appendix below.
Very distorted music is heard, which just confirms you are on Track 1 (music).
If such music is not heard, BRIEFLY press the + (or the –) on the MP3 player.
This should start the music track.

Next put the spectacles on, and then press the + (or -) to quit the music and to start the square wave.
Next set the sound volume as explained in the section "VOLUME CONTROL" in the Sub-Appendix. No haste is needed. Take time to do this.
Finally, because some time has been lost while doing this, select the music track again, by pressing BRIEFLY the + (or -). Distorted music will be heard. Then, BRIEFLY press the + (or -) to re-start the square wave track. This simple procedure will re-start the square wave from the beginning of the ramp, so no ramping will be lost at the start. There is no urgency needed.

It will play for 49 minutes, if required.

Follow the general instructions in Fig. 1.2 of Chapter A (ii) (Fast Method for Visual Imagery). Caution: See the very last paragraph of this e-book, page 188.

After about 10 minutes, (without removing the spectacles of course) rotate the left-hand potentiometer to zero, to stop the flashing into the left eye. All 4 bulbs on the RHS should still be flashing, at 6 flashes per second (6 Hz). See Fig. 1.2 in Chapter A (ii) for full details.
When trees etc are being observed, gaze into the distance to avoid the flashing, the intrusion/perception of which will gradually decrease. If flashing intrudes again, ignore it and gaze into the distance again.
Switch off the outer two right lamps to improve the images.
[Later, try also switching off the inner lamps (put the outer lamps back on), but this will probably not give good images.]
The two toggle switches for this are on the narrow black box.
Do not switch off all the lamps!
You need to know where you placed the boxes, before putting the spectacles on!

It is important to be in a relaxed state before starting – use the Schultz relaxation recording. This is on a separate CD -- it could be put in the MP3 player as Track 3 (etc), but to avoid possible confusion it is better kept quite separate, on a CD.
Do not allow any adventitious thoughts during the 10 minutes of ramping to the final state, but after that, such thoughts will increase the flashing perception and conceal the images, but this can be reversed by just excluding all thoughts and the images will return as the flashing seems to fade away.

Battery charging for the Maxell MP3 player:
Only if needed, plug the 4-pole jack plug (this is on a separate lead) into the (only) socket on the Maxell MP3 player. Then connect the other end of the 4-pole jack plug's lead into a computer USB port.
When charging, the red light on the MP3 player will flash slowly.
When fully charged, that light will stay on continuously.
Remove the charger cord. DO NOT OVERCHARGE this model (1½ hours maximum). So do not leave it unattended while charging – preferably set a timer alarm to (say) 60 minutes as a reminder.

If the battery goes flat, do not leave it flat -- recharge the battery immediately, to preserve battery life.
Charge every 3 months, if not in use.
If the MP3 player has a red light on, switch it off by pressing the ►|| button until the light goes off.

SUB-APPENDIX to Appendix 5: Familiarisation with the Maxell MP3 player.

Only needed once, for initial familiarisation: To check operation of MP3 player only:

Important to familiarise, because you will need to operate the MP3 player in the dark, but it only has 3 buttons.

Plug earphones into MP3 player.

Press and hold the ►|| button until the red light appears (on its RHS).
Release button.
Press button again, but briefly only, to start playback.
Press BRIEFLY either the "+" or the "-" symbol to get back to the other track.
Music will be heard: either TRACK 1 (music), or TRACK 2 (square wave).

(There are only 2 tracks recorded on the MP3 player.)
TRACK 2 is the square wave input needed for the main L&S device.
A square wave will be heard.

VOLUME CONTROL:
This procedure will probably not be needed, as the default (automatic) volume setting at switch-on is probably ok. But listen to the sound quality and volume and compare it with the optimum result from the procedure below. The volume should be "loud" but not "very loud".
Be familiar with the procedure below in case needed:

Plug the earphones into the earphone output on the main L&S device.
Connect the MP3 player to the L&S device with the short lead with 3.5 mm stereo plugs on both ends.
(Select the square wave sound track as explained above.)
If the + or the – button is pressed & held, the volume will increase or decrease.
To set the best volume level for the square wave, press & hold the – button until the square wave sound goes off (or almost off). Then listen carefully and press & hold the + button; the sound will increase as a musical monotone, but if the volume is too high it becomes just clicking (no tone).
Select the optimum volume as the best sounding series of tones (no clicking).

Note: If the + or – button is not held down for long enough, the unit will change to the other track instead of changing the volume.

SWITCHING OFF Maxell MP3 player: Press and hold the ►|| button until the red light goes off.
IMPORTANT: If this is not done, the MP3 player will probably remain on until its internal rechargeable battery goes flat.
Do not let its battery stay flat – charge it immediately (see separate instructions above)

Note: In Pause mode (not needed) the MP3 unit will auto-power-off after 2 minutes.

BASIC INSTRUCTIONS, copied from Fig. 1.2 in Chapter A (ii), are on the next page:
Caution: See the very last paragraph of this e-book, on page 188.

Basic instructions

From Fig. 1.2 of Chapter A (ii)

Important: Eyes **must** be kept closed throughout.

"Lilliput" LES 6 volt torch bulbs are used, 4 over each eye; the two vertical pairs over the right eye can be switched off (see below). **Warning**: See DISCLAIMER on page 4, and see page 188.

Check that both potentiometer knobs are fully clockwise at start (both knobs turned to position 3 on an imagined clock-face around knob). ENSURE that the unit is not upside down! The "left" potentiometer should control the flashes to the LEFT eye (check in a 'dummy run' before using).

Chart of the scheme {this is Fig. 1.2 in Chapter A (ii)}:

Top view of head (oval shapes below). Frequencies in Hz.
Light flashes to eyes in **bold** type, sound tones to ears are in *italics*:

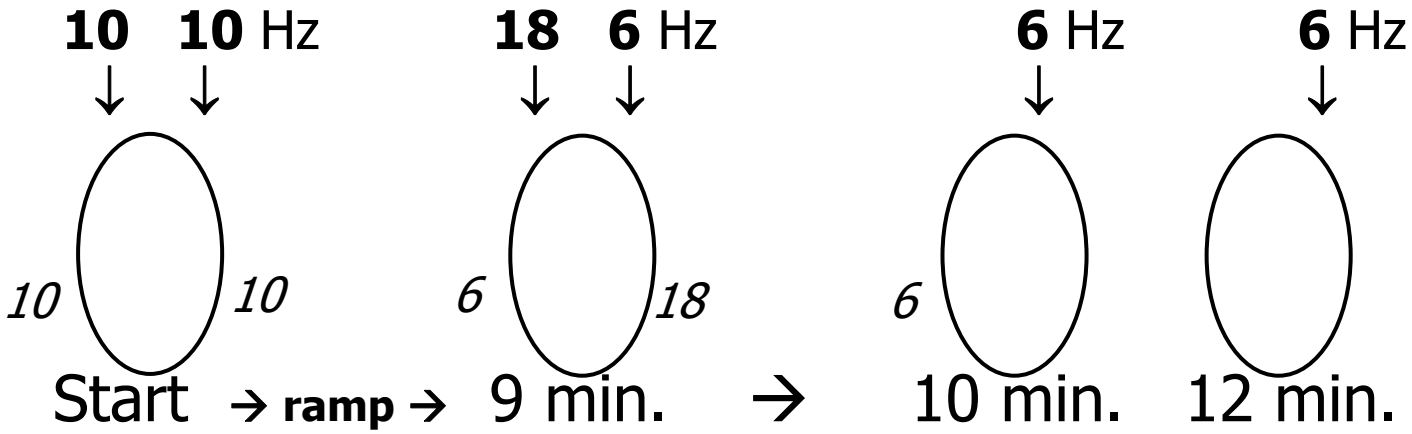


Fig. 1.2 Top view of head. Ears not shown. Frequencies in Hz.
Light flashes in **bold** type, sound tones in normal type:
Start: **10** Hz flashes to both L & R eyes, and 10 Hz tones to L & R ears.
The ovals are top views or "plan views" of the head, at the times shown.
Ramp (automatic) to reach **18** Hz (Beta) flashes to L eye, & 18 Hz sound tones to R ear,
and, **6** Hz (Theta) to R eye & L ear, at 9 minutes. (No need for user to measure 9 minutes
as it is obvious from the lights & sounds that they have become constant after 9 minutes).
Remove right earphone (18 Hz, Beta) at 10 minutes.
Rotate **left** potentiometer to zero to stop flashes to **left** eye (18 Hz, Beta) at 10 or 11 minutes.
Remove left earphone (6 Hz, Theta) at about 12 minutes.
{Optional Experiments: After about another 2 minutes, very slowly reduce the R brightness.
After a further 5 minutes, reduce right brightness further, but if the vision is lost, increase it.
Later, raising to maximum brightness will produce more-vivid images.}
Hold for 30 to 50 minutes (optional session length).
Important: Eyes MUST be kept closed at all times, (for safety reasons).
Important: See Appendix 7 for "Troubleshooting", in operating the above programme.
Appendix 6 (this Appendix) gives essential instructions on using an MP3 audio player,
and, especially, Appendices 3 & 8 give other important essential instructions.
Caution: See the very last paragraph of this e-book, on page 188.
Note: The above instructions can be reversed (on another day) to send the 18 Hz flashes to the other eye, also changing over the left & right sound inputs, to give an improved result.

Appendix 7:

See Warning on last page (page 188).

"Troubleshooting" used by the **author**, if imagery was not observed**:**

All steps below to be done without removing the lamp goggles.

-- Did you test the unit with eyes closed?
(It is very unlikely to work if eyes were kept open, also hazardous)

-- Did you see a bright visual field for the first 10 minutes, changing slowly during the ramp-down to final frequencies (6 Hz and 18 Hz)?

-- Did you hear tone pulses in both ears, with the left ear reaching 6 Hz after 10 minutes, and the right ear hearing 18 Hz?

*-- Did you manage to then turn down the knob which controls the ~~left~~ eye flashes, to successfully put off the ~~left eye only~~ flashes, and leave flashes to the right eye ~~only~~ (continuing at 6 flashes per second)? **This is important.***

-- Did you remove the higher-frequency pulsing (right) earphone first, after about 10 minutes or more (from the start)?

-- Did you then remove the lower frequency pulsing (left) earphone?

-- Could you prevent any adventitious thoughts arising during the whole process?

-- After the 10 minutes ramp-down, did you see anything apart from the 6 Hz flashing?
Did you try to gaze "into the distance"?

-- AUDIO**:** Were you able to select and use the audio tone pulsing channel (not the test music channel)?
(There were only 2 channels on the MP3 player, and the music channel was for test purposes only)

-- Were you able to start off fairly quickly, and thus not to lose the first part of the ramp-down time?

-- Did you try the relaxation exercises on the CD (e.g. Schultz relaxation), which are very useful at first and then could be dispense with it in later sessions.

NB: It is advisable to first go through the procedure **without** wearing the goggles, to become familiar with it, as it needs to be done later while wearing them.

A Comment:
Some women have said that they have no knowledge of science, but if they can do needlework or tapestry, this is exactly the dexterity needed for soldering, and when I tell them that many women work in factories doing soldering, they just look blank ! I have had comments from non-scientific people that they cannot construct the circuit, but if they are unwilling to even try, I am not sure if they deserve to reap the benefits !?
A story from ancient Greece, is told of a young man who asked a philosopher if he could teach him how to access the "inner world". The teacher then pushed the man's head under the sea (that they were both standing in at the time) and after some time he released the man who was about to drown! The philosopher told him, "*You need to want to succeed as much as you wanted to take a breath of air just now, if you are to be successful !"*

SEE COLLECTED PROCEDURES AT VERY END OF THIS E-BOOK: Appendix 8.

CHAPTER B

Remote Viewing Mechanism

"Remote Viewing" is a modern re-name of "Clairvoyance", as the latter word has unfortunately become associated with fairground trickery. There are many non-genuine "clairvoyants".

The author can personally vouch absolutely for the genuineness of the artist who drew Figures B.1 & B.2 below:
Heather DuPré, in London. The subjects shown in these Figures were stable and persisted long enough to be drawn, and they disappeared if she closed her eyes and re-appeared when opened again. No drugs were used. A scientific explanation is given below under "Etheric vision".

The author has also met others (who also were not taking any drugs) and has also asked them the same question on whether their visions are still visible if they close their eyes, and they have also reported that their visions disappear if the eyes are closed and re-appear when opened. This means that these visions were not hallucinations, in the author's opinion, and were of the 'etheric' type (see below). 'Astral' (dreamstate) visions do not disappear.

Mention of fairies brings a disbelieving smile to most people's faces!! But one of these observers reports the ability to see "nature spirits" (fairies) and also said that these are still seen if viewed via a normal glass mirror, instead of directly, so the author's conclusion is that they are a reflectable near-optical electromagnetic energy (to which their eyes are sensitive). In some country districts nature spirits are more commonly mentioned, worldwide, and the many types have been classified into very many specific names.
Reports were much commoner before the Industrial Revolution when rural people were probably more sensitive. This is discussed later, in a separate section below. Evidential basis for Remote Viewing is given in reference [8].

Fig. B.1. A vision perceived by and drawn by Heather DuPré.
(© 2010 Heather DuPré)

Note on Figures B.1 & B.2: The artist says that if she closes her eyes, the vision disappears and re-appears on opening; and if she looks away it is still there when she looks back. This means it is not a hallucination. Similar-looking psychedelic art from independent un-connected people worldwide suggests that an objective reality exists (i.e. it is not just from within one individual's mind). Examples of such psychedelic art are available on the internet, with search words, "Psychedelic Review", or, "Isaac Abrams".

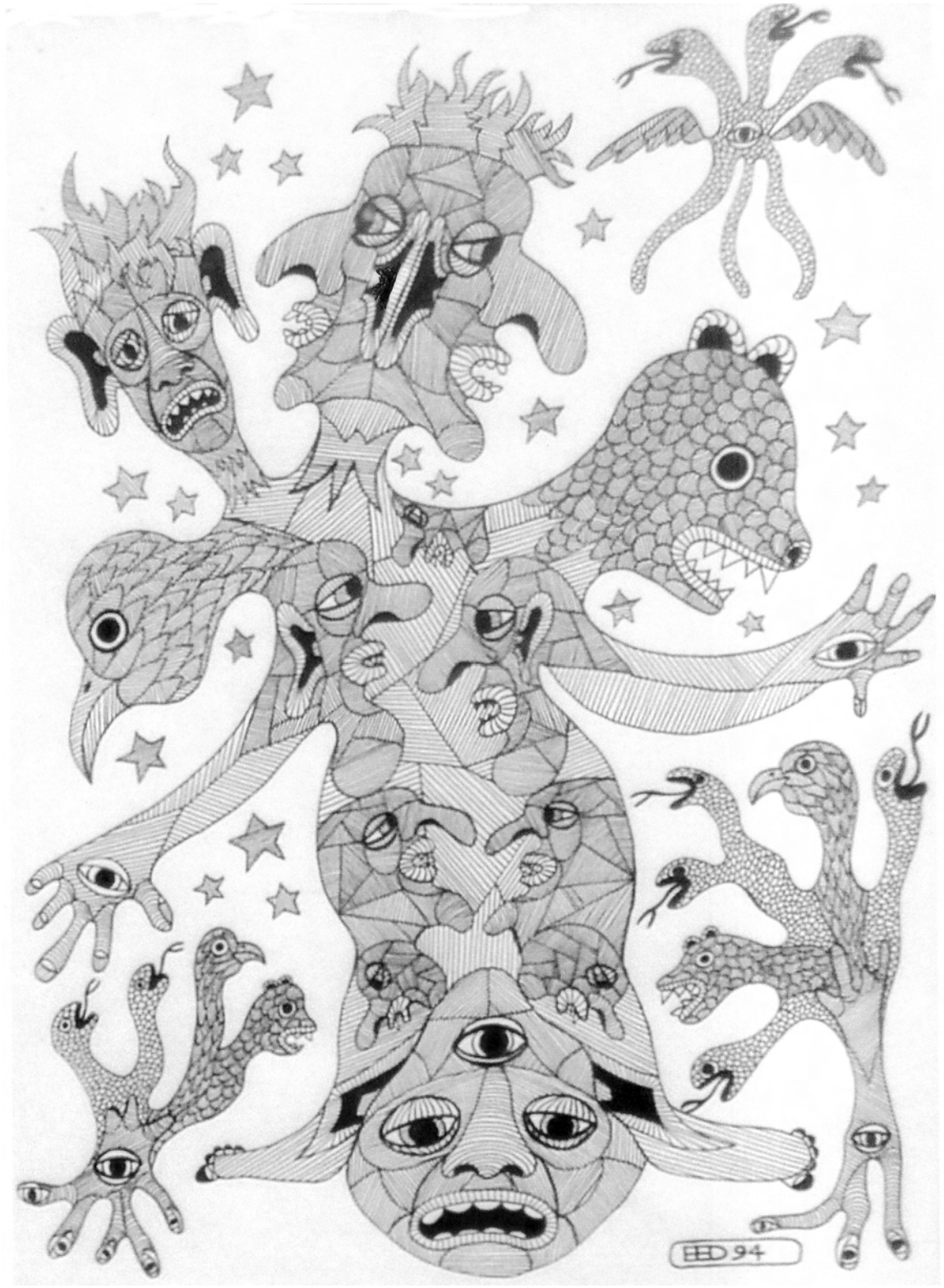


Fig. B.2. A vision perceived by and drawn by Heather DuPré.

These are two of 20 remarkable pictures by this artist.

Important note:

Medicinal anti-psychoactive drugs are available to completely suppress this type of vision, which shows that the presence or removal/absence of specific brain chemicals is a critical factor in allowing or suppressing visions. The mechanism could be to open up a normally-dormant "sixth sense", or to close it.

Leadbeater [1], one of the Remote Viewers whose results are reported in reference [8], gives the following information, *in italics*, brought up to date (in non-italic passages) by the author (MGH):
*"Etheric" vision: The range of visible wavelengths for most people is from red to violet but (*genuine*) clairvoyants have an extended range outside this, which confers an ability to penetrate solids* (like the ground-penetrating radar now used on building sites and by archaeologists; this is the microwave region, below infra-red). *Using etheric vision, veins of metal below ground can be perceived, small burrowing animals are seen below ground, etc.* Water divining (used officially by many local government councils) is a non-visual aspect of this (sense of touch instead of vision).

If a (mechanical) *clock is viewed from the back, the back face is penetrated by etheric vision and the working parts can be seen, and beyond these the front face of the clock is seen, with the figures seen written backwards. This differs from "astral" (4-D) vision (*see below*) which does not use the physical eyes and so which does not disappear if the eyes are closed, unlike etheric vision. Etheric vision uses only the retina (*which contains light-sensitive cells and also brain-type cells*). Etheric vision is entirely physical* and can be imitated by physical devices like ground-penetrating radar.

Clairaudience uses the sound receptors in the ears and requires an extension (rare) of a person's audio response into the ultrasonic. The artist of Fig. B1 & B2 (in Chapter B) has super-acute hearing, extending into the ultrasonic range when tested, & is clairaudient.

With this introduction, an explanation can now be given of the visions shown in Fig. B1 & B2. An entity is being observed which is composed of a state of matter not visible to most people whose vision range is from red to violet of the visible spectrum. If an entity is composed of neither solid, liquid nor gas, but of (cold) plasma (the so-called 4^{th} state of physical matter), it will not be seen by normal eyesight but only by eyesight with a range beyond the normal red to violet. It disappears from perception if the eyes are closed, and so it is not a hallucination, and is seen by the retina, and should be visible to another (similarly gifted) observer.

Rarely, photographs have been taken of nature spirits but are controversial due to suggestions them being fake photographs. Probably the best-known are the Cottingley Fairies [2], discussed in a separate section below.

Folk stories mention use of eye ointments which enable ordinary people to see nature spirits, which can be well-understood today as due to minute concentrations of psychoactive drugs which may extend the perception of the retina (author's speculation).

Astral vision: This is non-physical and does not use physical receptors like the eye retina, but uses the "chakras" (described on page 24 of ref. [8]). *If the clock example is used as above, with astral vision, which is 4-dimensional, the clock is seen from all sides simultaneously and the figures on the front face are seen correctly and not seen "backwards" as with etheric vision.*

A 3-D cube is seen from all its 6 faces simultaneously. The 4-D analogue of a 3-D cube is shown on the front cover of this book as a perspective drawing in 2-D of this 4-D object, which is called a tesseract, and is explained as follows:

If the outer cube is in ordinary 3-D space, its 6 faces will each be one face of another 6 cubes extending "within 3-D space" into a 4^{th} spatial dimension, and the 6 far faces of these 6 cubes will form another cube which is totally remote in 4-D space. Total number of cubes = 8. The angles are all right angles in the tesseract! This is further discussed below.

2, 3, & 4-D Space: The square, cube, & tesseract.

To explain a 4-D tesseract, consider the analogous explanation for telling a hypothetical 2-D space inhabitant what a 3-D cube is:

To a hypothetical 2-D being, the 3rd dimension is that direction in which he cannot point, and for us the 4th dimension is that direction in which we cannot point. The eyes of a hypothetical 2-D being cannot record a 3-D object, simply because the only light rays which can be focussed by a 2-D camera are those moving in the plane of the paper. Imagine a ray passing through the paper from the 3rd dimension -- it would intersect the paper only at a point and so could not be focussed. See Fig. 1.2 on page 23 of ref. [8]. By analogy, we cannot see or photograph any 4-D object.

To a hypothetical 2-D being, living in the plane of this paper, Fig. A8.1 below is how we could explain to him what a cube is: the outer square is in his 2-D world but the inner square is in a parallel 2-D world lying above (or below) his 2-D world, remote from it in the 3rd dimension.

The six enclosures are all squares and all the same size, but are of course distorted by the perspective of the 2-D drawing. We can visualise Fig. A8.1 in 3-D, as a cube - just stare at it for 10 seconds ! But he cannot visualise it.

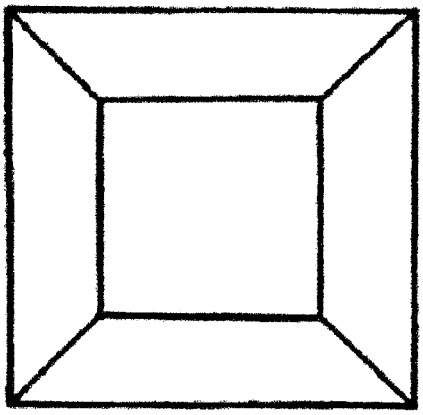


Fig. A8.1. A cube drawn on paper.

A further explanation to a hypothetical 2-D person is that a 2-D figure Fig. A8.2 below must be imagined to have its 4 outer squares bent up (or down) at right angles out of the 2-D plane of the paper and their 4 furthest edges will then form another square but entirely remote in 3-D space above (or below) the central square:

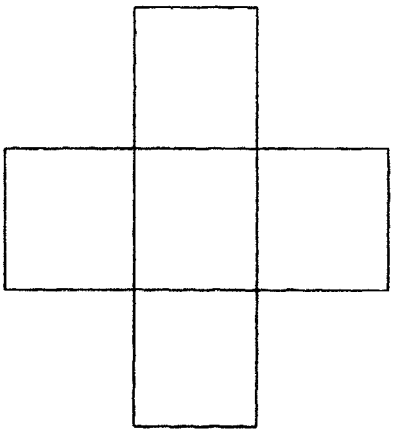
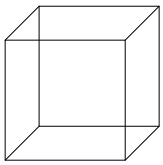


Fig. A8.2. Construction of a cube.

This can be drawn on his 2-D paper as shown in Fig. A8.1 above, or, as our normal perspective drawing of a cube:



But he would not be able to understand that all its angles are right angles!

Similarly, by analogy, 3-D beings (ourselves) can try to visualise a tesseract, which is the 4-D analogue of a cube, as follows. See the tesseract figure below and imagine a cube is forming inwards into 4-D space from each of the faces of the large outer 3-D cube, and these six new cubes will then form another smaller cube (having 6 faces) totally remote in the 4th dimension. But in a tesseract, all angles are right angles and all 8 cubes it contains are the same size! The perspective drawing below distorts the angles and sizes. This is a drawing on 2-D paper of a 4-D tesseract:

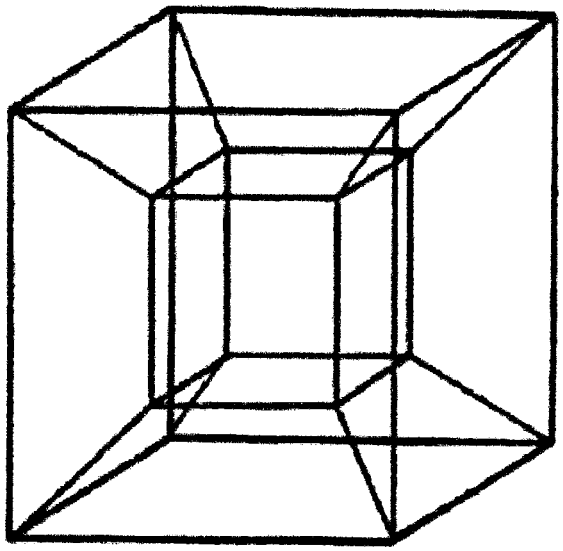


Fig. A8.3. Tesseract, the 4-D analogue of a (3-D) cube.

Similarly, a 5D analogue of a tesseract can be obtained by imagining a tesseract going into 5D space from each cube of the 4D tesseract, and the far cubes of such a structure then form another tesseract totally remote in 5D space. But this is too complex to draw on paper and is not shown here!

The Cottingley Fairies: Pictures: See Fig. 1.3, in [8].

In 1917 and again in 1920, a total of five photographs were taken by two girls, aged 9 and 15 in 1917, apparently showing fairies. The last of these (Fig. 1.3, in [8]) is "unfakeable"; the fairy wings are transparent and grass stalks are seen behind and in front of them. But the surprising story of the first four is summarised below. All 5 were taken at Cottingley, near Bradford, where Elsie lived. Frances lived with her cousin Elsie at Cottingley from 1917 to 1919. In 1919 her father returned from World War I and Frances then went to live in Scarborough. Frances visited Elsie in Cottingley for the last 2 weeks of August 1920.

Two photographs taken in 1917 apparently showing fairies were shown in 1920 to E.L. Gardner [2]. He sought a photographer who was knowledgeable about fake photogaphy, H. Snelling, who was professionally able to examine the photographs fully. Snelling's considered judgement, in his letter to Gardner of 31 July 1920, was: "These two negatives are entirely genuine unfaked photographs of single exposure, open-air work, show movement in all the fairy figures, and there is no trace whatever of studio work involving card or paper models, dark backgrounds, painted figures, etc. In my opinion, they are both straight untouched pictures." [2].

The last three of the 5 negative plates printed in Gardner's book [2] were (secretly) pre-marked plates which were given (in 1920) to the girls by Gardner and 3 photographs (C, D & E) were taken in the glen at Cottingley. Elsie had prepared paper cut-outs for photographs C & D only. After exposure, the 3 plates were developed by Elsie's father, who was an amateur photographer, and returned to Gardner in London. Gardner then had the marked plates confirmed as being three which had been secretly marked by the manufacturer (Illingworth). Photographs C & D had been taken during the week and E (Fairy Bower) was taken by Frances on the following Saturday when she saw misty objects beginning to appear in harebell-filled grass and she instinctively reached for her camera and took the photograph from about 3 feet [4]. It is significant that this differs from the other photographs by having no girls in the picture. Frances returned home to Scarborough the next day, Sunday and the plates were posted back to London on

Monday or later in the following week; Frances did not see her uncle develop the plate but received a copy on her return home.

The earlier (1917) two (unmarked) plates (before Gardner's involvement) were loaded by Frances' uncle Arthur Wright) and developed by him. (He did not want any publicity and always indignantly declined to receive any money throughout the whole series.)

Gardner instructed Snelling to enhance photos A & B (the two 1917 photos). These were then re-photographed with a camera different from Arthur Wright's Midg camera. The Midg was only used to take the two 1917 photographs. From these two new negatives, Snelling made lantern slides; he also made photographs for sale at Gardner's lecture at Mortimer Hall, London. This lecture brought them to the notice of Sir Arthur Conan Doyle.

Following Snelling's opinion, it was proposed that if the negatives survived a second expert's judgment, preferably Kodak's, then Edward Gardner and Conan Doyle should join forces and make the photographs a leading feature in a Strand Magazine article. An appointment was made with Kodak's manager, Mr West. His studio chief and two other expert photographers were also present. The negatives were examined by all at some length, and the results of the inspection were as follows, all agreeing [2]:
(1) The negatives are single exposure.
(2) The plates show no sign of being faked work, but that cannot be taken as conclusive evidence of genuineness.
(3) Kodak's were not willing to give any certificate concerning them because photography lent itself to a multitude of processes, and some clever operator might have made them artificially.
(4) The studio chief added that he thought the photographs might have been made by using the glen features and the girl as a background; then enlarging prints from these and painting in the figures; then taking half-plate and finally quarter-plate snaps, suitably lighted. All this, he agreed, would be clever work and take time.
(5) A remark made by one was, "after all, as fairies couldn't be true, the photographs must have been faked somehow."

This last remark shows obvious negative prejudice.

Some historical background is in an extract from "Chronicles & Stories of Bingley and District" by Harry Speight (1904):
"Around Bingley (Yorkshire) there used to be, and possibly there still is, a strong belief in the existence of fairies. In Gilstead Crags there was an opening in the rocks known as "Fairies Hole", and it was said that the tiny creatures used to trip and dance and play their merry antics in the bright moonlight. Anyone who intruded at such a time, it was said would lose their sight. At Harden, in a secluded part of Deep Cliff, it is said that the fairies could sometimes be heard clanging musical tongs and what looked like tiny white garments hung out on the trees could be seen on bright nights." (taken from reference [5])

The author's (MGH's) comments on this are that, "the opening in the rocks" is reminiscent of the experience of Yajna (see ref. [8] Chapter 4, page 133-135 and see especially p. 136).
The fairies could be in a parallel 3-D world ([8] Chapter 1). The comment about "loss of sight" above is also mentioned by others and by Leadbeater [1] who said that etheric vision (see above) uses the physical eye and its retina, and if these are damaged (only temporarily, hopefully) then sight will be lost.

In 1983, sixty-six years later than when she first saw the fairies, Frances prepared notes for a book which was subsequently published in 2009 by her daughter [4], from which the following details are given:

She said that she (aged 9) often visited the stream alone because Elsie was normally working. She was daydreaming one day and then saw a miniature man about 18 inches tall walking down the bank. He held a leaf in his hand and crossed the stream by just walking over it, walking on the water, and quite unaffected by the current which she expected to carry him downstream. This first time she saw him, he stared at her and was aware that she could see him. But on later occasions he gave no indication that he knew she was seeing him, but she sensed that he knew.

His face was that of a typical working man and was neither ugly nor friendly. Later she said she saw him leading other miniature men, dressed like him in green clothing. She watched them until

they went behind some plants out of sight. Frances said she did not tell Elsie for a long time and it was her own secret, which she did not want to share. She said Elsie never mentioned seeing the miniature men or "the pretty fairies" when she was there with her when they appeared.

It turned out later that Elsie never saw any fairies and only Frances had that gift of "second sight".

A website [5] reports that in the 1980's, a forester (Mr Ronnie Bennett) in Cottingley Estate Woods, reported having seen fairies in those woods. He claimed that he saw elf-like figures while working there: "When they showed themselves about nine years ago there was a slight drizzle around. I saw three fairies in the woods and I have never seen them since. They were just about ten inches tall and just stared at me. There is no way the Cottingley Fairies is a hoax." [5].

The author (MGH) comments that drizzle was present during this sighting. There is a waterfall in the beck (see it on left side of picture 10436087 in [8] Fig. A8.4 between p. 63 & 64); it was raining for the week before the day (in August 1920) when the last, "unfakeable" photograph was taken ([8] Fig. 1.3 between p. 63 and 64, and enlarged in Fig. A8.5 & A8.6). This means there would have been high humidity in the air, rising from the rain-saturated ground.

The waterfall (out of focus) is seen on the far left of picture 10436087 ([8] Fig. A8.4 between p. 63 & 64), about 20 feet behind Frances, age 9, and rocks are on the right. It is known that breaking water into tiny drops creates a negative charge cold plasma ion cloud. So the waterfall produces ideal conditions for a normally-invisible cold plasma (if nature spirits have bodies composed of that) to become normally-visible and photographable. Millikan's cloud chamber is used in modern physics to see plasma particle tracks and if the nature spirits (composed of cold plasma) were in a high humidity atmosphere or something else within the wavelength range recordable by a camera, then they could become photographable.

In the summer of 1917, Frances was 9 and Elsie was 15. Fairies are traditionally said to be seen by some pre-puberty children but rarely by adults. There were no more photographs after the

summer of 1920. Four years later, in 1921, Frances returned to Cottingley for a week. During this week G. Hodson (clairvoyant) was with them at all times at the beck but no photographs were taken.

It emerged later [4] that Elsie had never seen any fairies at any time but she felt sorry for her younger cousin who was always in trouble for slipping and getting her clothes wet in the beck. Following a particularly difficult incident, Elsie had the idea of making paper cut-out fairies and taking a photograph of them with her father's camera, thus showing the grown-ups that this was why Frances was always going near the beck.

Elsie, liked jokes, and set up fake pictures with paper cut-outs, as she could not get fairies to appear. See [8] Fig. A8.4. She asked Frances to agree a children's pact never to disclose this, but many decades later Elsie disclosed it and the press latched onto it, claiming fraud. Accounts of the controversy that this caused are found on the internet (search for: Cottingley Fairies), but for an accurate account see the book written by Frances and her daughter [4]. The first 4 photographs were of paper cut-outs which Elsie had produced. Elsie and Frances had remained silent until 17th February 1983 when Elsie said in a letter that all the photographs were a hoax, claiming that they had drawn the fairies, cut them out and fastened them to the ground with hatpins. This was not true for the 5th photograph. Elsie was not telling the truth in 1983 when she said that all 5 photographs were fakes. Frances, who was the first to see the fairies (when she was alone), said in her last television appearance in 1986: "there were fairies at Cottingley".

The expert who had supplied the last 3 (1920) marked plates, confirmed they were the ones he supplied; he would not commit on plates C & D but said the last one (E) was, "an impossibility to fake" [2] (see [8] Figures 1.3 & A8.5 & A8.6 & captions, near p.63).

Critics have suggested that the fairies' hairstyles, being those of the time (1917), means that the fairies are cardboard fakes made by the girls, but it is reported by Remote Viewers that fairies like to copy humans (whom they can see), so the hairstyles do not

prove anything. Mediaeval reports of fairies describe them in mediaeval attire.

In the years, after Conan Doyle's 1920 & 1921 articles in Strand Magazine, and Conan Doyle's book "The coming of the Fairies" in 1922, the girls were hounded by the press, to the extent that Elsie emigrated to America to escape it. A video [3] was made about 60 years later by Warner Bros, press hounding re-started but the girls were then much older women in their 70s and Elsie began to say that it was all a hoax. This turn of events was of course a great dis-service to the subject, but as always, it is not "allowed" for an incontrovertible proof of such phenomena as fairies to be given; an element of doubt is always inserted!

But, as a suggestion by the author (MGH) for another attempt, if hot plasma (excited atoms & ions) is available in a visible form as a flame (unlike an invisible-to-us cold plasma), then "salamanders" (specialised nature spirits) could possibly manifest and become visible in flames to any observer who has only normal eyesight. It is said that if a fire is lit, then salamanders from miles around rush into it. But nature spirits reportedly keep well away from humans, except young children (example above), as they don't like their disturbing thoughts nor their iron objects (being a sign of the presence of humans), so a view of them is a very rare occurrence. This suggests use of a method like a "hide", as used for photographing birds. For photographing salamanders, a camera could be set up some distance from a fire out in the wilderness and left running with no humans nearby. This experiment has probably never been done. (Note: Caution is required with an unattended fire -- CCTV is a way of supervising it remotely).

The above suggestion is facilitated by the specific (reported) attraction of flames, for salamanders, which is not available for fairies, who can be located anywhere (so one would not know where to place a camera and so many attempts would be required). But there is also the probability for fairies to become visible to normal vision or photographable in a mist and perhaps in a plasma generated by the aura of a "sensitive" person (like Frances); maybe both are required. It is hoped that someone may try these experiments.

It is reported by Besant & Leadbeater [6] that many millennia ago most people were able to see nature spirits. In recent times this is quite rare [7]. But over many decades and even centuries, very many accounts exist of fairies still being seen by a significant number of people, e.g. see examples in reference [2], but they are all anecdotal and so do not pass the criterion for science that any observation must be reproducible by anyone. But this does not mean that they are untrue, of course.

Sceptics studiously ignore all the evidence in these persistent accounts down the centuries, which, although anecdotal and thus "not accepted by science", are nevertheless "witness statements" which are a class of observation routinely considered valid in a court of law.

Acknowledgement: The author is grateful for additional unpublished information from Mrs Christine Lynch, the daughter of Frances Griffiths. See especially reference [4] below.

References for Chapter B:

1. C.W. Leadbeater, "Clairvoyance", publ by TPS, Adyar, India (1899 & later), available as a free download from: www.AnandGholap.net
Note: This website has many free downloadable books, but see important comment in General References below.
2. E.L. Gardner, "Fairies", publ. by Theo. Publ. House, London (1945). Contains photographs. See: http://www.cottingleyconnect.org.uk/fairies.htm
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This video is about Conan-Doyle's (actual) investigation of the fairies.
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Website: www.cottingleyreflections.com
Also available from Saltaire Bookshop and Media Museum, Bradford.
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CHAPTER 1

CONSCIOUSNESS - THE ULTIMATE FRONTIER

"Let us learn to dream, gentlemen": Kekulé (a famous chemist)

A study of creative scientists (27) says, "Creative persons appear to have stumbled onto and then developed to a high degree of perfection the ability to visualise ... in the area in which they are creative. This is illustrated by reports by many of the great inventors of the past."

The mathematician Poincaré described a relaxed condition in which mathematical ideas "*rose in clouds, dancing before him and colliding and combining*" into what he recognised as the first set of Fuchsian Functions, the solution to a problem he had been trying to solve.

The chemist Kekulé spoke of deep dreamlike reveries, leading to his theory of molecular constitution, "I turned my chair to the fire and dozed. Again the atoms were gambolling before my eyes. My mental eye, rendered more acute by repeated visions of this kind, could now distinguish larger structures, in manifold conformation; long rows, sometimes closely fitted together, all twisting in snakelike motion. One of the snakes seized hold of its own tail and the form whiled mockingly before my eyes. As if by a flash of lightening I awoke ..." He urged his contemporaries, "*Let us learn to dream, gentlemen*."

Another scientist dreamed a sought-for formula, wakened, and hurriedly scribbled it down - only to find he could not read it the next morning! Each succeeding night he concentrated on re-dreaming it and eventually succeeded. This time he got up and carefully recorded the formula, for which he was awarded the Nobel Prize (28).

The author Jean Cocteau reports visualising, "*as if from a seat in a theatre, three acts in which appeared an epoch and characters about which I had no documentary information*", which formed his subsequent play "The Knights of the Round Table". Robert Louis Stevenson's ability to command his mind to furnish him with a story while he slept is well documented. There are many other such accounts, e.g. Graham Greene's ability to dream plots for his novels (110).

These accounts show that valuable ideas may lie dormant in the deeper and less accessible parts of the mind.

Beyond our 5 Senses:

Beyond our normal 5 senses there is evidence that we have other faculties which are normally subliminal and thus not perceived (1-25;32-42;45-47;84-105;111;113-116;123).

These faculties may be responsible for intuitions which are translated into all kinds of vitally important creative work, ranging from scientific and engineering invention to the composing of great music and art. Also, greatly enhanced and fast learning rates may be achieved, with no wandering of attention and no boredom, if the mind is placed in certain special states. It is thus very worthwhile to explore this subliminal region of the mind. There is also evidence that if the mind is deprived of sensory input, it "turns up the volume control" and in this state its normally subliminal and subconscious regions can be perceived.

Many traditional methods (14,15) exist for this purpose, many of them in the monastic traditions of all religions, but the process is in no way tied to any religion or belief and can be performed in an entirely secular way, as I shall show below. Science has recently moved into this fascinating field and has evolved various electronic units which greatly assist this quest. Before reviewing these units it is necessary to give some background against which they can easily be understood.

Many years ago I met Maharishi Mahesh Yogi (the guru of the Beatles and founder of 'Transcendental Meditation' or TM). In describing his method of approaching the subliminal areas of the mind he told me to repeat a short word after him; he then spoke this word for me at (I estimate) about 4 or 5 repetitions per second. At the time I thought this was surprisingly fast; I would have expected a slow rate of about 1 per second. Many years later, I discovered why he chose that rate - it is the rate of a particular electrical frequency in the brain called theta waves. It doesn't matter much what the repeated word is; a purely secular word like "one" can be used and is equally effective. A long line of Hindu monks have been using this method from time immemorial and it must have evolved because it works and not (perhaps) because they knew the theta frequency was the right one to chose. It may take years to achieve results by this traditional method, trying verbally to "drive" the brain at the theta frequency; but electronic light and sound units are now available which may achieve this result in minutes! This has been called a form of 'instant mysticism'.

Another way to modify brainwaves is by drugs (1,6,20). This is also a form of instant mysticism, but usually the people involved are wrongly motivated and the flaws in one's personality can be magnified a thousand fold and reflected back at one, unless proper preparation is made. The personality may disintegrate, opposite to the other methods to be described below.

Modern biofeedback methods for revealing the inaccessible regions of the mind are an important area for investigation and training. The deeper levels of the mind are the source of all kinds of vitally important creative work. Later some electronic units will be described, which allow us to become self-conscious and aware during a dream, using no drugs.

Retrieval of 'twilight-state' material can be facilitated by speaking, into a running audio-recorder, just one word which will later act as a powerful mnemonic to recover the rest later. Attempts to give a complete story while in the twilight state will usually end it abruptly.

Most people live at a lesser efficiency than they are actually capable of. A few people, like Edison and Einstein, have a natural ability (or have chanced across how to develop it) for excellent performance. But following recent advances in electronics this can now be learnt and we do not any longer have to just admire genius in others: we can create it in ourselves.

Whatever your day time activity, you can benefit from the electronic units described in this book. We are fortunate in living in an age of great electronic advances. See especially Chapters A (i) & (ii) and Chapter B. Chapter A (ii) describes the author's recent experiences of fast visual images observed with eyes closed but while fully wide-awake. This could be a valuable quick aid to meditative states which may otherwise take years to achieve.

Another aspect is the attainment of mystical states, which allow insights into depths of truth unattainable by the discursive intellect. Such insights have a tremendous sense of authority (45).

Koestler (125) writes, "*... the temporary relinquishing of conscious controls liberates the mind from certain constraints which are necessary to maintain the disciplined routine of thoughts but may become an impediment to the creative leap; at the same time other types of ideation on more primitive levels of mental organisation are brought into activity.*"

NOTE ON THE NATURE OF VISIONS:
Vivid visions are seen in deep meditative states, and also by volunteers in other situations:

(i) *Sensory deprivation:* At first, the mind will do anything to prevent the removal of the sensory input to which it has got used. In research on the effect of sensory deprivation [25], volunteers stay in a totally black room in total silence. After an initial long period of sleep, their brainwaves drop to lower frequencies spontaneously. They see bright visions. Similarly in a flotation tank -- see Chapter 10.

(ii) *Charles Bonnet Syndrome:* Macular Degeneration is a loss of central-area vision, which can sometimes cause vivid visions to appear spontaneously. Being spontaneous, this is a form of uncontrolled visionary experience, and anything can appear, like in a dream (a "daydream" in this case).

Mechanism: This is discussed in another book by the author [See Chapter 3 in ref. 115]. Briefly, there is evidence for the existence of higher states of matter which is so diaphanous that it passes through "ordinary" matter without any hindrance at all (e.g. neutrinos, of which 60 million pass through us per second without being perceived!).
If, say, a castle appears, that may have been caused by one's imagination acting on such finely diaphanous particles and forming them into the imagined shape: a self-generated "hallucination". But then, another observer with a (rare) ability to perceive such material, would see the castle, now "objectified" and no longer a hallucination. In medieval times, such objects observed by gifted people ("second sight") were called "astral" because of their self-luminous character (like in a dream -- occurring at night when the room is dark). The so-called astral region is all around us, but normally un-perceived, and abounds with such "thought forms" generated by others, which may be perceivable by someone with the Charles Bonnet syndrome, or by someone (a rare individual) with "second sight".

Before proceeding further, it is necessary to give some basic information about the brain.

CHAPTER 2

BRAIN ACTIVITY

In Meditation, you don't work with the "Mind", you work with "Awareness"

During the normal working of the brain, very small electrical signals are generated in it. These can be detected and displayed using an electronic amplifier (electro-encephalograph, EEG). These signals were first discovered about 100 years ago. Alternating low frequency voltages of about 10 microvolts amplitude were detected on the scalp and recorded by a sensitive galvanometer. Today we use amplifiers to magnify these voltages. Over 2 million miles of EEG chart paper have been used in the last century! So EEG instrumentation is clearly well established.

A few gifted individuals in our society have made outstanding contributions to science and the arts. In case a clue to this might lie in their brain electrical activity, some of these people were investigated using an EEG. An explanation is necessary about the different types of electrical signals in the brain, which are best classified by their frequency**;** see Fig. 1.1.

Relation of Electrical Signals in the Brain to our State:

BETA (around 20 cycles per second or Hz) is our normal everyday thinking state. (There are also higher frequencies, such as those around 4OO cycles per second, called P1 & P2).

ALPHA (around 10 Hz) is our state with eyes closed and all thoughts excluded from the mind, and is fairly easy to achieve. Any attempt at thinking will immediately put us back into a beta state again. But it is possible to LEARN how to think in the alpha state and even to solve problems while in it. A few gifted individuals were discovered to have this ability naturally, e.g. the famous physicist Albert Einstein was found to able to think about problems while in an alpha state. This state borders on the next-lower state, the theta state (about 6 Hz), which is thought to be responsible for the creative and intuitive faculties. So the alpha state is the doorway to the theta state, whereas the everyday beta state is 'once-removed' from it. Einstein thought in images, not words:
"Imagination is more important than knowledge." - A. Einstein.

Edison used to relax in a chair with a metal sheet on the floor and a rubber ball in his hand over it; relaxation produces the alpha state and the deeper intuitive theta state, but this is usually accompanied by loss of the beta which means one falls asleep. Edison prevented this happening because the ball then fell on the sheet which woke him up and in this way he maintained some activity in beta, alpha and theta and was able to bring the inventions of this special state into his aware mind.

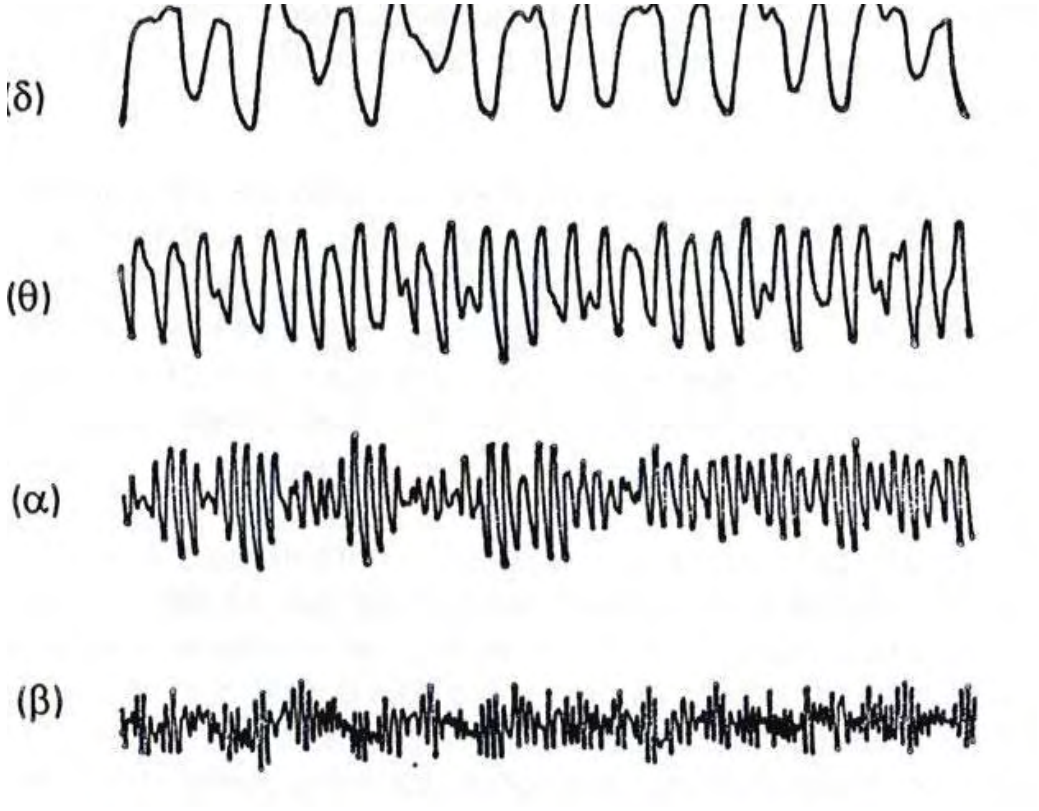

Fig. 1.1

Principal Brain Rhythms found in EEGs

(From top to bottom)

(δ) Delta = 0.5 to 3.5 cycles per second.
(θ) Theta = 4 to 7 cycles per second.
(α) Alpha = 8 to 13 cycles per second.
(β) Beta = 14 to 30 cycles per second.

A monotonous job can induce an alpha state, e.g. driving a car on a long journey. Car makers have devised an alpha meter alarm for drivers to wear, with a simple headband. An alternative method is an "eyes closed" detector which sounds an alarm if the eyes stay closed for more than a preset short time.

Opening the eyes makes alpha hard to produce for beginners. But if you open your eyes disinterstedly, i.e. without seeing anything, just gazing abstractly, then with practice you can produce alpha waves. Alpha by itself is no good - you must produce alpha with some beta and theta as well, the theta for contacting the subliminal levels of the mind (inner experience) and the beta as a link to normal consciousness.

THETA (around 6 Hz) is our state when dreaming. It is a state of visual imagery which a very few gifted individuals are able to enter spontaneously at will. A traditional monastic exercise in advanced meditation is to cup one's hands and see (with visual imagery) a daffodil in one's hands. Success in this traditional meditation (mind training) method is normally many years away, but with EEG biofeedback or the use of an electronic light and sound unit or similar, success is only hours away and one can even learn fairly quickly to develop the state of mind needed to reach theta wave production by the brain without having to use the machines. Theta is a mind state for problem solving and entry to it is a worthwhile pursuit.

It is useless to CONCENTRATE (a left brain hemisphere activity - explained in Chapter 3) on producing a daffodil image, or any other meditation imagery exercise. One has to IMAGINE it only (i.e. use the right brain hemisphere). And when it appears, one has to be an entirely DISINTERESTED observer, or it will vanish just like a dream vanishes if you try to analyse it while it is going on. It is a knack to observe a daffodil or a dream state vision in a disinterested way. To continue in a theta state, it is essential to develop this knack. Any attempt to think about (analyse) the scene will instantly destroy it. The brain reverts back to its everyday beta state. With continued practice the above-mentioned knack can be cultivated.

The right (artistic) hemisphere of the brain generates visual images. The left (analytical) hemisphere does not. **In meditation, you don't work with the "mind", you work with "awareness".** 'Meditation' is a secular word, merely meaning a form of mind training. See Chapter 4.

Kasamatsu & Hirai (29) studied the brainwave output from people with long traditional training in mind control and found a shift from beta through alpha to theta waves, which the people producing the waves described as a state of "knowing" (= right hemisphere) rather than of "thinking" (= left hemisphere). Years of training are required unless light & sound machines or biofeedback equipment etc is available. These will be described later in this book.
A brain in a theta state is in a state of visual imagery and because of the unusual luminous quality of the images this state was termed, in mediaeval times, the astral state. So-called ‘astral consciousness’ is not something weird; it is nothing more than a state of visual imagery. But this does not mean it is unreal; the image of the daffodil is absolutely as real and solid in its "region" as a wooden table is in our physical region, although an inability to distinguish the two has been used as a definition of insanity. Do not let this put you off, of course, but just remember when you see your daffodil that it is entirely ‘astral’ and not physical. With (a lot of) practice, one can slip in and out of astral and physical vision without difficulty. It is a knack. A few individuals have this ability naturally; a famous one was William Blake.

The daffodil is no greater illusion than a physical table, because the table can be made from materials found available in the physical world just as the the daffodil can be made from the materials of the ‘astral’ level. Both are thus equally **constructs** and both are thus equally illusory!

Children's brainwaves are normally rich in theta, which links with their imaginative and special type of consciousness, which unfortunately leaves us as we grow up. But it can be regained by EEG theta training, for example. Children's imaginary playing is akin to what is called pathworking (23). In the theta state our consciousness has become transferred to a so-called astral level. A theta state is a state of visual imagery and with (a lot of) training one can enter this without falling asleep and losing consciousness. This is one of the major uses of an EEG as a biofeedback device and of light and sound and other units.

DELTA is the fourth and last major brainwave rhythm, about 1 Hz, and is the state of dreamless sleep. (Theta is dreaming sleep). EEG studies have shown that a few people like psychic healers and other psychics can produce delta while in a normal conscious state. One of my colleagues can produce delta easily on request by "going very quiet". Delta is associated with psychic abilities. The pioneer mind-researcher Maxwell Cade has successfully used an EEG to identify potential trainees to be effective psychic healers. Maxwell Cade, using an EEG also showed that when a psychic healer TOUCHES a patient, the patient's EEG pattern becomes the same as that of the healer (the "laying on of hands"). There is no orthodox scientific explanation of this phenomenon. A meditation teacher with developed inner intuitive faculties can do the same - hence the value of meditating in the presence of a gifted teacher, but they are as rare as hen's teeth!

Chapter A (ii) gives an easy quick method for entering a delta state while fully wide awake, which is a very rare state of mind normally.

Iamblichus, in the third century, describes a state between waking & sleeping in which voices are heard and sometimes "a bright & tranquil light shines forth". More well-known are Swedenborg's writings about his 'distant vision' and other experiences and ways of inducing them (123).

CHAPTER 3

LEFT AND RIGHT BRAIN HEMISPHERES

It was discovered long ago that we have almost independent left and right brain hemispheres (43, 127, 126). Oversimplifying for brevity, movements of the left hand are controlled by the right brain hemisphere and right hand movements by the left

hemisphere. More recently it was discovered that the left brain hemisphere is the linear logical thinking part of the brain - a sort of calculator. About 2/3 of the population are left-brain dominant. In particular, technical people (e.g. scientists) are left-brain dominant. The right hemisphere is where visual imagery is perceived and so artists are right-brain dominant. The right hemisphere is responsible for spatial matters, like recognising faces, maps etc. and art appreciation, as well as music. In scientific people, the left brain is often so dominant that their right brains often close down & go to sleep because that hemisphere has nothing to do; they are literally 'half-asleep' [Fig. 2.1]. Each brain hemisphere tends to be active and then dormant for some time, alternately, causing bouts of daydreaming while performing scientific calculations for example. In a recent interview, the celebrated Sri Satya Sai Baba commented that scientists have 'half-knowledge'. Ouspenski, a pupil of Gurdjieff (19), said, "*Man is asleep...life for him is only a dream...from which he never wakes.*" We are sleepwalkers moving about in a twilight of consciousness but believing ourselves to be awake (5).

This "half-asleep" condition of the brain is far from ideal because the right brain is thought to be the source of inspiration and intuition. So science and engineering which is done only with the left brain will be rather unimaginative, without inspiration or sparkle. If you want to bring inspiration to a technical activity, you need to activate the right brain, e.g. to invent a new process, or, if you are a business person, to run your business creatively.

Electro-encephalograph (EEG) patterns:

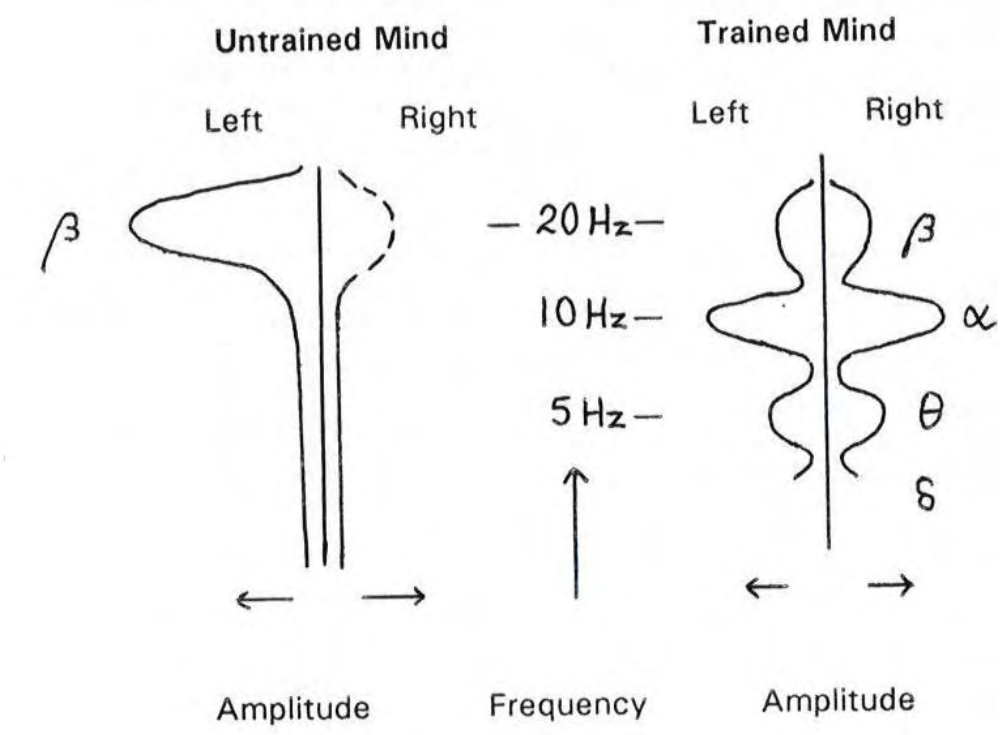

Fig. 2.1

Activating the Right Brain Hemisphere:

The right hemisphere is concerned with visual imagery and spatial perception, e.g. if you want to remember where you put a certain book, this recollection is done by the right brain. To activate it we need to look at a landscape for about half an hour; there must be no buildings in it or the left brain will start to analyse them! If you do a painting you will get better results if you paint with your left hand for a while because that hand is controlled by the right (artistic) brain.

Or instead, looking at a geometrical design, traditionally a mandala as shown in Fig. 3.1, will activate the right brain as follows:

Focus on the centre of the mandala (Fig. 3.1) and relax. After 5 minutes a quieting of the mind will begin to replace the mind's usual inner dialogue. After several sessions, extraneous thoughts etc. will be unable to penetrate into your consciousness. Prevent the left brain from trying to logically analyse the mandala, by keeping concentrating on its centre. At first you will find yourself looking for and analysing any geometrical symmetries which are present, but this is a logical-left-brain activity and should be ignored (just let the left brain get on with it). The next thing you will notice is probably boredom; this is the left brain having exhausted its logical analysis that is now trying to tempt you to give it up and do something else which it prefers! It is an activation barrier and if you persist you can get over it and activate the spatial domain of the right brain and the left brain begins to go to sleep. You then enter a slightly altered state of consciousness in which there is no feeling of boredom at all. In fact the bored feeling that you pass through is a sign of success - boredom here is a welcome sign because it means the left brain is protesting that there's nothing for it to do! Persist and it will close down.

After relaxing the grip of the left hemisphere on your consciousness by use of a mandala or by biofeedback, etc., you are ready for meditation, or for pathworking (Chapter 9).

A professor of architecture uses mandalas and guided imagery before starting his architectural designs (48). He teaches his students to enter the right brain mode and imagine that they are walking through the building before starting their design.

Sport is mainly a right brain activity - an old (and unfair!) trick is to make your opponent activate his left brain, e.g. by shouting comments or questions requiring logical analysis. This can irrecoverably destroy his game.

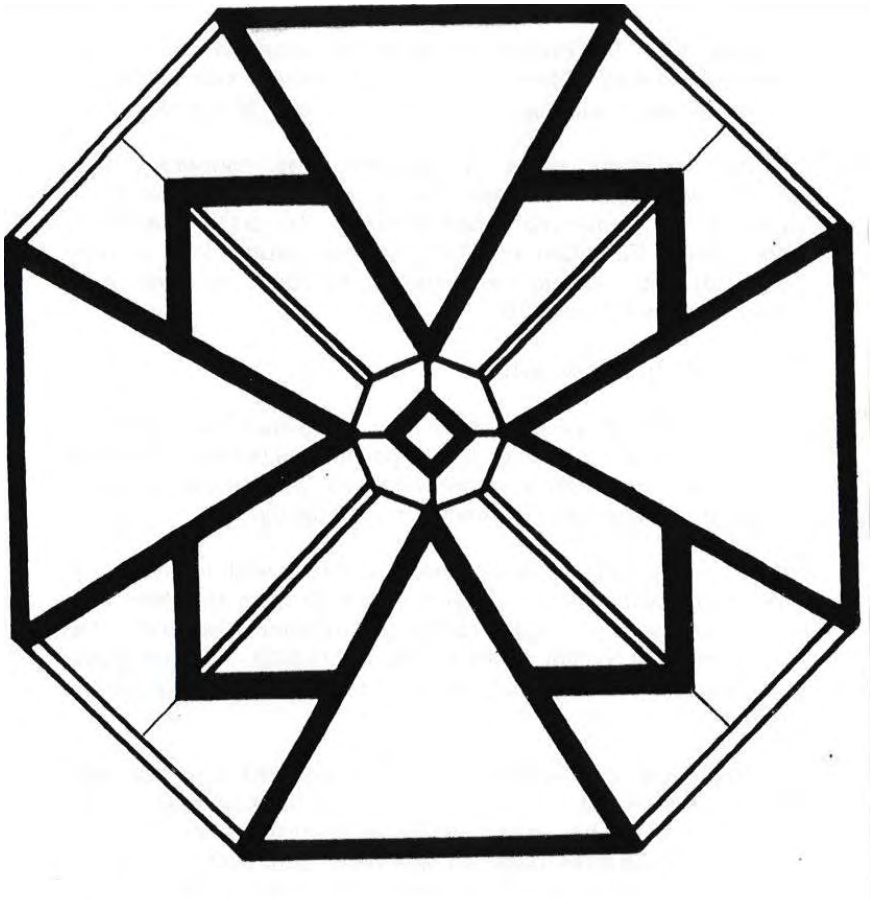

Fig. 3.1 A Mandala

Judging from the number of computer games which involve wizards and magic, there is an increase (perhaps subconscious!) in the subconscious - i.e. in the right brain area of operation.

There are many ways of activating the right-brain, like meditation, Zen, light and sound machines (discussed in Chapter 7), hemi-sync tapes (Chapter 7), cranial electrical stimulation (CES)(Chapter 11), narcotic drugs (not recommended) etc., and an easy way is to spend an hour in a flotation tank (Chapter 10).

Right vs Left Brain Activity:

A remarkable demonstration of how completely dominated by the left brain our culture is, is that patients have had their entire right brain hemisphere surgically removed, without their noticing the slightest change in awareness subsequently!

If you ask yourself a question such as, "what shall I do with my life?", and write the answer with your right hand and then with your left hand, you will probably get different answers! The right brain has a quite different view of life (48). Zdenek gives valuable exercises to bring forward and develop the right brain (48).

Different cultures may progress along mainly left or mainly right brain development. Culture is reflected in language, as the following examples (well known to linguists) show. Indo-European languages have an analytical (left brain) subject-predicate

structure, e.g. "The stone fell down", but the totally different language structure of the indigenous North American Indians has a process structure (right brain) and the event in the above example would be expressed as, "It stoned down". The subject (stone) would be expressed as a process (a verb, it stoned).

Consequently, European culture has developed in a linear logical scientific way (left brain), while North American Indian culture has developed in a spatial process way (right brain) and has produced shamanistic insights which most Europeans lack. Some grasp of these can be obtained from the books by Carlos Castaneda (20).

Once we have advanced along the "European" left brain path, our growth will stop unless we add the totally different "Red Indian" (for example) right brain development. Only then will we become fully integrated. Developing along only either the one, or the other path, will leave us quite unbalanced, although we may not realise this until the very environment starts to protest, as is now happening (e.g. global warming, ozone layer hole, etc.) (30).

The "European" path is closer to the material world and so has given rise to material wealth, while the "Red Indian" path is not and so has not. This does not make it any less valid than the "European" path. We are suffering much more than we realise through not encompassing the "Red Indian" way; see the Hopi video "*Koyaanisqatsi*" on this topic (30).

Dominance by the left hemisphere is strongly reinforced by our system of education. At birth the hemispheres have equal powers, but work independently. In childhood, considerable right-brain activity occurs: imagination, intuition, musical, little sense of time. But at school these are rewarded by disapproval: daydreamers. Intuitive thinking is so disapproved of and so much a right-brain activity that a recent study showed no correlation with examination grades: intuitive thinking is unrelated to college grades (51). But all recognised geniuses say their ideas have come from the unconscious, which can be identified with the right brain.

Balancing our Brain output:

Right-brain activity and theta brainwaves are needed for visual imagery. Light and sound machines and EEGs with biofeedback can fill both these requirements. The light and sound is applied to both hemispheres and this will wake up any dormancy in the right (or left) hemisphere. An EEG with biofeedback (e.g. displaying the brain activity on a screen) allows you to observe and it is possible with some practice to correct the pattern as desired.

After some use of the stroboscopic feature of a light and sound machine, there will be a lasting and beneficial tendency for both hemispheres to operate together. Another unit for equalising brainwave outputs is the alternophone (see also chapter 7); a note alternately played into left and right ears at an alternation frequency of about 4 Hz (the frequency with which the hemispheres naturally communicate via the corpus callosum) will produce a heightened state of consciousness after about 30 to 45 minutes (24). To activate the RAS (see Chapter 10), the sound pulses used in the alternophone must begin with a sharp crack - this relates to the cracking of a twig behind one which causes the primitive RAS to 'turn up' one's attention for a fight-or-flight response.

It has been reported that reverse speech is used by the right brain and hence if a tape recording of a conversation is played backwards, revealing words from the right brain can often be heard (126,127). Reverse-playing tape recorders are available to facilitate this.

Music is a right-brain activity and also removes stress. For those interested in the eastern tradition, listen to "Dorje Ling" by David Parsons (137). This has gongs, 12 foot Tibetan trumpets & deep bass Tibetan monastic voices. Listen with eyes closed to band 1 followed by band 4 only. It has a most remarkable effect; I have never heard anything like it.

For the western tradition, there are several choices. Movement 2 only (Et in terra pax) of Vivaldi's Gloria in D major (RV589) is unearthly in the rendering by the USSR Academy Chorus {film music of last 4 minutes of "Runaway Train", available second-hand on internet {now deleted except in USA, Milan CH067, CD}}, but not so striking in some other versions. Parts of "The Encircled Sea" by Boyle, "Spem in alium" by Tallis and Fantasia on a Theme by Thomas Tallis by Vaughan Williams are other recommended music. There are many other choices of music in the western tradition.

Music is further discussed at the end of the next chapter (Chapter 4). Poetry is also a right brain activity. To illustrate its effect read the poem at the end of this chapter. This remarkable poem is the result of right brain inspiration, albeit out of balance in this poet's case.

Phosphenes (after-images) have long been known to have special effects (24). Looking steadily at a 60 watt whitelight (mushroom) bulb at about 70 cm for 30 seconds creates a phosphene when the eyes are subsequently closed. Do not wear glasses while doing this; do not use the sun as a light source without precautions. An application in education in learning some formulae is to read them through and then review them mentally while looking at a phosphene in the dark. Some French tests (24) report an increase in I.Q. by looking at phosphenes. The Roman emperor Julian was trained in the Greek Mysteries and shortly afterwards advised people to look at phosphenes, so we may perhaps infer that the use of phosphenes was taught in the Greek Mysteries. In the ancient Zoroastrian religion people were asked to look through a small opening at a fire, which would produce a phosphene (24). It is said that it increases one's insight or intuition.

To digress, the use of auguries in the Greek & Roman Mysteries is worth mentioning. Consider this: President Lincoln was killed in Ford's Theatre by a man who then ran to a warehouse. President Kennedy was killed in a Lincoln Continental car made by Ford, by a man in a warehouse belonging to Continental Warehouse Co, who then ran to a theatre. President Kennedy had a secretary called Lincoln, who advised him not to go to Dallas that day. President Lincoln had a secretary called Kennedy, who advised him not to go to the theatre. These are only some of the well-documented auguries surrounding President Kennedy's death.

Use of light and sound machines is also reported to increase I.Q., which until fairly recently was thought to be unchangeable for an individual throughout life (apart from its well-known variation with age). Two theories are that apprehension is reduced which allows higher I.Q. scores, but it has also been proposed that intelligence actually does increase: a beneficial increase in the number nerve connexions in the brain has been reported (2). Also a synchronicity of activity in the two hemispheres of the brain is reported for light and sound machines, hemisphere synchronising tapes and EEGs with biofeedback. This effect gives a strong and beneficial enhancement of general brain power. Learning from pre-recorded tapes while simultaneously using these devices has been reported in several studies to be greatly enhanced (super learning) compared with normal learning (2). In the theta state the brain is capable of uncritical acceptance of information at about 3 times the normal rate. These mind machines are the technological equivalent of enriched environments which can stimulate brain

growth and in minutes can produce an increase which takes a month to achieve in an ordinary environment (2).

Oo O oo

Could we with ink the ocean fill,
Were every blade of grass a quill
And were the skies of parchment made
And every man a scribe by trade

To write the Love of God above
Would drain the ocean dry;
Nor could the scroll contain the whole,
Though stretched from Earth to Sky.

Author unknown

(found written on a wall in an asylum)

oo O oo

CHAPTER 4

MIND TRAINING

"Meditation begins with the cessation of thought.
Thought is the cessation of meditation" - Krishnamurti.

"One cannot see into the depths of a lake
unless the water surface is still & calm." -
Maharishi Mahesh Yogi.

Mind training or meditation is provided as training courses (with outside teachers) by several multinational companies and even by the US Army. This is partly because an important side benefit is the relief of stress; it is very important for a big company that its key executives are not off work due to stress-related conditions. EEG patterns show stress as a large beta signal, usually on the left side only [Fig. 2.1].

Biofeedback:

Meditation can be greatly assisted by observing one's own brainwaves using an electro-encephalograph (EEG). This is known as 'bio-feedback'. It can also be more conveniently assisted by using a light and sound machine which drives the brain frequency. The brain state required is that which has been observed in EEG studies on expert meditators, which is theta with some sidebands of alpha and beta as a link to consciousness (rather than to sleep) [Fig. 2.1].

Traditional Meditation Techniques:

Traditionally, meditation is taught by a teacher who purportedly has inner powers so that he or she is able to quickly correct the pupil's techniques because he can see the results of the pupils attempts at meditation on inner levels which are not accessible to ordinary people. This is correction by FEEDBACK of information. With a gifted teacher, inner illumination can be thus gained in a few months, which could take 10 or 20 years otherwise. Now an EEG can, to some extent, replace the teacher's inner powers and a light and sound machine can induce the desired brainwave pattern.

Meditation has been studied by several psychologists. Benson et al (73) studied traditional and modern systems (like 'Transcendental Meditation', TM) and biofeedback. They found that all systems worked by causing the relaxation response. From the commonalties of all the systems, they concluded that there are 4 preconditions for creating the relaxation response**:**

(i) a steady stimulus, like a repeated word, or looking at a given object, which causes a shift from everyday logical thought;
(ii) distractions must be ignored and attention returned to the meditation;
(iii) decreased muscle activity is essential (comfortable position);
(iv) quiet surroundings are essential.

To (iii) Maxwell Cade would add that the position must not be too comfortable or sleep occurs - a straight back avoids this (5). Use a chair with a firm back but not an armchair or you will fall asleep. The traditional Indian lotus meditation position has this in mind.

Sadhu (14) has collected many excellent classic exercises on concentration and put them into a self-study practice course of graded difficulty. E.g. look at a (mechanical) watch with a moving second hand and try to reach 2 minutes without any extraneous thoughts intruding; concentrate only on the moving hand. This is quite difficult for beginners, until the knack is obtained, and if a thought intrudes the 2-minute target time must start again! Another exercise is to look at the head of a pin and concentrate only on it for a target time. The next exercise requires 4 dimensions and so cannot be performed with the 3-dimensional normal way of thinking.

Some training in concentration is necessary, in normal conditions, at least the ability to exclude unwanted thoughts and quieten the mental dialogue.

But all 4 of the requisites (i) to (iv) listed above are immediately and effortlessly produced by flotation! This is discussed in Chapter 10. The traditional need for avoiding an over-comfortable position is also sidestepped in the tank because other (automatic) mechanisms (the Reticular Activating System, RAS, explained in Chapter 10) prevent sleep.

The problem with traditional meditation systems is that they are not easy, requiring considerable time & effort. Many people give up. A flotation tank provides the easiest system giving all the benefits obtainable by advanced meditation and its beneficial physical effects are not just temporary. It apparently makes the hypothalamus lastingly more stress resistant (59,79), without any particular conscious effort being directed to this end (41).

Mindfulness is a technique where full attention is given to the changing content of one's awareness, e.g. Zen meditation (5). In contrast, in concentrative meditation, one's whole attention is given to a particular idea, to reach absorption into it, e.g. Christian, Sufi and Yoga meditation systems.

You may create (or discover) an 'inner advisor'. This is a powerful technique and an outstanding book on it is reference (47).

Even people who have never experienced deep relaxation have it conferred on them in a flotation tank (discussed in Chapter 10), most usually in their first float (41).

Breathing Exercises:

Breathing exercises are very important and are discussed by Cade & Coxhead (5). They suggest full concentration on the breathing process only, excluding all else and not changing one's field of view, for 5-10 minutes. If you remain conscious of yourself, you cannot succeed. In time, a brief state is reached where sounds are not heard and no external world exists; one is lost in one's own mindfulness of breathing. Self-consciousness becomes identified with one's breathing and if the attention is held on it long enough, one becomes one with one's own breathing. Then the mind and body merge. In this brief state is joy, happiness & tranquillity but it takes repeated practice to extend its duration & lead to very high mystic achievements. The flotation tank (Chapter 10) makes the whole process very much easier.

Simple Breathing Exercise
A simple breathing exercise can activate the right side of the brain: alternate nostril breathing. Close your right nostril with the thumb and inhale to a count of 4 (say); hold your breath for a count of 4 and then breath out through your right nostril for a count of 4 (closing the left nostril with the forefinger); then hold your breath for a count of 4. Repeat this cycle many times until you notice a sense of clarity. This should be done daily. Meditation or an imagery exercise will also activate the right brain & balance the hemispheres. See references 48 & 126.

Sufi Breathing Exercise
The following advanced traditional breathing exercise will eventually take your consciousness aloft.

Place right-hand middle finger over right nostril and left thumb over left nostril.

Inhale via left nostril. Imagine current rising via LHS branch of spine + a clockwise spiralling force going up.
Then turn eyes up.

Exhale via right nostril. Imagine current descending via RHS branch of spine + a clockwise spiralling force going down.
Eyes normal.

Inhale via right nostril. Imagine current rising via RHS branch of spine + anticlockwise spiralling force going up.
Then turn eyes up.

Exhale via left nostril. Imagine current descending via LHS branch of spine + anticlockwise spiralling force going down.
Eyes normal.

Inhale via both nostrils. Imagine current rising via middle of spine + double helix force going up. Eventually this step takes your consciousness aloft.
Then turn eyes up.

Exhale via both nostrils. Imagine current descending via middle of spine + double helix force descending.

Keep repeating this cycle.

Visualisation

Chapter A (ii) in this book describes an effective fast and easy method developed and used by the author.

Cade (5) described a simple 'hypnagogstat', reminiscent of Edison's method, which is effective in holding consciousness into the *theta* state of visual imagery. This is simply a buzzer with a reverse-acting push button which is released if one falls asleep, whereupon the buzzing wakes one up again! Another simple method described by Tart (46) is to hold up ones forearm when in bed, resting it on the elbow, so that it falls abruptly if one falls asleep and this wakes one up.

A sports (basketball) study where one group practised, one group visualised and one group did neither, found equal 23% improvements in the first two groups (75)! A terminal cancer study where patients visualised white blood cells as a vast army of valiant white knights on horseback or ravenous white dogs or powerful polar bears tearing apart & devouring the cancer cells, showed doubling of longevity compared to a control group, and many 'spontaneous remissions' (complete recoveries) (41, 50).

Any imagery can be used; Hutchison reports one person visualising his heart as a big house, walking into it and repairing its rooms like a carpenter with hammer and nails and plaster! The effect is almost instant (41).

A study was made where specific immune system activities were tested and the subjects were then hypnotised and told to visualise an activity increase in these same specific parts. Subsequent tests showed that the activities of these parts had actually risen (41). Hutchison points out that results using just hypnosis can be surpassed using tank floating (discussed in Chapter 10)(41).

Longevity should be increased by tank flotation, but results on this are not yet available. An "age clock" exists in the hypothalamus and neurotransmitter chemicals output normally decreases with age (52).

As Hutchison points out (41), manipulation of mental imagery is an ancient method for marshalling inner energies for healing. Biofeedback research shows that visualisation is very effective for modifying any body process - e.g. migraine is alleviated by visualising the hands dipped into hot water (which actually increases the blood flow to

them). Muscle tensions can be relieved when imagined as tightly twisted cloth becoming limp (41).

In a study where women were told to visualise a warm towel over their breasts, all such subjects showed significant breast size increase, averaging from 1.5 to 2 inches, with many of the women also reporting a simultaneous body weight loss (53-56)!

As Hutchison says, "what you 'see' is what you get!" (41).

Taylor reports studies showing that 'high imagers' are more relaxed, creative, mature and flexible, than 'low imagers', and that absence of imagery correlates with strong aversion to act on impulse (58).

People having extraordinary memories are gifted with mental imaging abilities.

People using flotation tanks (discussed in Chapter 10) have higher theta wave output and visualise better than non-floaters (41). Everyone has the potential to visualise & produce theta waves and can realise this with training (light and sound machines, hemisync tapes, flotation tank, etc.).

The flotation tank is unique in producing both deep relaxation and strong mental imagery (visualisation) spontaneously & without effort. See a further discussion of visualisation in Chapter 10.

Refer to Chapter 9 on pathworking.

Music and Visualisation:

Music is a valuable help in visualisation, very well discussed by Drury (84).

A recent survey of 60 people who have had near-death experiences report hearing similar music to each other, which has a "beautiful floating sound and evokes feelings of overwhelming bliss" (116). Near-death experiences are reviewed by Moody and others (95-99). These people's hearts had temporarily stopped and in the survey afterwards music was played to them to discover which sounded most like the music they had heard while 'dead'. It was decisively New Age type synthesiser music and many of the survivors wept on hearing it again.

The highest ranking music was 'The Angels of Comfort' from 'Angelic Music' by Iasos (available from 4-D Books at www.4-D.org.uk/Books), and other fairly high scorers are 'An Ending' from 'Apollo' by Brian Eno, 'Journey to Stratos' by John Serrie, 'Structures of Silence' by S. Roach and Neptune from the Planets Suite by G. Holst.

CHAPTER 5

DRUGS, NARCOTICS, OPIATES
vs
Our Natural ENDORPHIN Production

Note: The author does **not** recommend psychoactive drugs, and has never used any.

Drug misuse is an increasing problem in our society. But there are a few examples of some drugs which are not accompanied by undesirable side-effects which antisocially modify one's waking behaviour. These include drugs for lucid dreaming, which operate when asleep. See especially**:**
T. Yuschak, "Advanced Lucid Dreaming", ISBN 978-1-4303-0542-2 which is highly recommended reading.
It covers use of certain herbal supplements, which, unlike narcotic drugs, do not alter one's waking behaviour and so are morally acceptable. These produce immediate lucid dreams and "out-of-the- body-experiences" (OBEs), including a seamless transition from the waking state to lucid dreamstate consciousness.
In the USA, Galantamine has been sold as a dietary supplement for memory and dream support prior to being approved as a drug for mild Alzheimer's disease by the FDA. Internet suppliers include**:** www.smartnutrition.info/brain.html#Galantamine and www.dreamamins.com
and also Vitamin Express (USA) who call it 'Galantamind' (from www.life-enhancement.com), but these are herbal plant extracts and have no standards like BP or USP, so caution is necessary and the present author (MGH) cannot recommend or give an opinion on their use.
See**:** M.G. Hocking (Ed.), "Remote Viewing of Ancient Times: A historical novel of actual events from 100,000 BC to 500 BC"**:**
www.4-D.org.uk/Books (free download) for more information,
and also**:**
M.G. Hocking, (2011). "World Religion & History back to 70,000 BC, Discovered by Remote Viewing", 400pp. London: 4-D Books Ltd**:**
www.4-D.org.uk/Books (parts may be published later as a free Google Book)

Other drugs and Endorphins:
Brain cells contain receptor sites for opiates, called opiate receptors. If opiates (heroin, morphine, opium, methadone, etc.) are taken, they go to these sites and they also suppress the natural opiates (endorphins = "endogenous morphine" - i.e. internally produced morphine) which the body produces. Endorphin production thenafter continues to be much reduced, even for months after the opiate-taking is stopped. This gives withdrawal symptoms, because endorphins are needed to make one feel 'normal' and so if reduced, one feels 'ill' (withdrawal symptoms).

To summarise this, endorphins are the body's natural narcotics, which make us feel 'normal' by counteracting various depressive effects. Narcotic drugs inhibit endorphin production (and the receptor centres for them) and unpleasant withdrawal symptoms occur because the (natural) endorphins are absent and so nothing counteracts certain natural depressive effects which exist in our makeup. Some people have more, or have less, endorphin production and receptor centres, causing them to be happy, or depressive, types (59). This can however be beneficially modified by one or more of the techniques decried in later chapters. (Light & Sound, chapter 7, CES, chapter 11, and Flotation, chapter 10). These techniques increase endorphin production and can also increase one's immune system by increased control of hormone production (41).

Endorphins may be related to an area in the hypothalamus called a pleasure centre, which when stimulated electrically, gives intense pleasure such that all other activities will be dropped in its favour (60, 61)!

Endorphins and their generation:

Endorphin levels are naturally (automatically) increased within the brain, to cause a mild euphoria either as a reward for doing something which the body "considers" beneficial (e.g. eating, smoking etc.), or, to ease pain (e.g. endorphins are released after about 40 minutes of running - causing what is called "the runner's high"). Runners can feel (mild) withdrawal symptoms if they miss a habitual running session. This euphoric release of endorphins by low to moderate levels of pain also gives a rational explanation for other, non-beneficial, activities like masochism which otherwise seem bizarre.

Endorphins also explain the pain-killing mechanism of acupuncture needles when these are used for anaesthesia, from the following experiment**:** Naloxone is a synthetic drug of opiate structure but is without the pain-killing or euphoric effects of the opiates. It thus uselessly blocks up the opiate receptors. Anaesthesia by acupuncture will not work if Naloxone was pre-administered, proving that acupuncture anaesthesia is due to endorphin release by the acupuncture needle (62-64).

Techniques to enhance Endorphin production:

Cranial electrical stimulation (CES) also causes endorphin release & consequent pain relief & euphoria. Depression or unhappiness can be alleviated if we can enhance endorphin production. Floating is also analgesic and euphoric. In addition, in the tank environment, the RAS (Reticular Activating System in the brain - explained in Chapter 10) switches awareness away from the body, where nothing is happening, to the mind; all pain consequently fades away. Further, the tank distorts (shortens) time perception and this effect is analgesic.

After a 30 minute alpha frequency session with a light & sound machine, Cady & Shealy (124) found a 25% rise in endorphin level, 21% rise in serotonin and 11% rise in norepinephrin, by blood tests on 11 people in good health. An increased feeling of well-being was generated.

Endorphins determine what the world "looks like" for each of us, by selectively filtering (via an anciently evolved inherited filter) every sense input before passing it to our higher levels of consciousness: no-one really knows what the world looks like, as the philosophers Berkeley & Hume had earlier realised. Our impressions of it as a child are also, and significantly, different from those we have now.

Addiction is not confined to narcotic drugs. Alcohol is addictive because it causes the brain to release endorphins. Such addiction (releasing endorphins) can also involve cigarettes, food, work, coffee, sex, gambling, buying, running, religion, and all flow activities and basic human drives and anything involving the body's reward system, described above (57). Overeating leading to obesity is due to the depletion, every few hours, of the pleasure chemicals, such that withdrawal symptoms appear. The same pattern applies to the other activities listed above. One activity can compensate for lack of another.

Floating is the (effortless) answer to these addictions, without, apparently, itself being also an addiction!

Meditation (non-tank) as might be expected, also causes a dramatic reduction in addictions (65-67), but it requires some continuing effort.

Valium, Librium and benzodiazepine drugs relieve anxiety by fitting into what are (anachronistically!) termed 'valium receptors' in the brain (anciently evolved and so obviously not intended for the synthetic drug Valium, but for a natural anti-anxiety substance). Use of Valium is thus addictive, similarly to opiates. Valium is also probably dangerous, being linked to breast cancer in one study (68).

Behavioural science studies reveal that doing things we enjoy doing, apparently provides an intrinsic reward and has been called a "flow experience", "a holistic sensation that people feel when they act with total involvement" (69). An even match is needed between a challenge and a person's ability to meet it, to avoid the two extremes of either boredom (no challenge) or anxiety (overwhelming challenge) and obtain enjoyment. Challenges which constitute flow experiences may be predominantly physical, like rock climbing or sailing, or mental like playing chess. Hutchison describes tank floating (described in Chapter 10) as a flow experience, one reason being that the tank is both experience and environment (41). The chess player must find the equally matched opponent, but the tank floater always finds in the tank a perfect match! The tank eliminates both boredom & anxiety; the mind stays very alert which counteracts all boredom by immersing us profoundly in our awareness (41).

'Flow' is difficult to maintain for long in the real world, as things are usually beyond our control there (69). But the feeling of control, developed in the tank, can be carried forward into the outside world.

Drug abuse

Light & sound machines have been used to alleviate withdrawal symptoms, if daily sessions are used, especially at theta frequencies. Cranial electrical stimulators (CES machines) are reported to be very effective for treatment of withdrawal and to help prevent further drug misuse. Similarly flotation as discussed previously (41).

Psychedelic Drugs

This is beyond the intended scope of this book. The remarkable effects of these drugs, taken under controlled conditions in a supportive clinical surrounding, are well documented (1, 6, 85-89). Dangerous side effects can ensue if taken without clinical supervision.

Very highly recommended books on N,N-dimethyl tryptamine (DMT) and on an ancient traditional South American drug called “ayahuasca” (which contains DMT), by R. Strassman, M.D, and by Prof B. Shanon, are referenced in Chapter A (ii) as references 14 and 15 in the reference list for Chapter A (ii).

CHAPTER 6

BIOFEEDBACK

In biofeedback, a display or meter is viewed by the subject and shows one or more of his/her body parameters (such as temperature, brainwave pattern etc.). It has been found that the subject is then able to alter this parameter through biofeedback making this a very powerful tool to alter one's state.

As an example of biofeedback, Maxwell Cade (5) reports that if a thermometer is taped to the subject's finger who is then asked to 'will' the finger to get hot, with all the force that can be summoned, then the result is that in less than a minute the finger gets considerably colder! This is because strong use of the will invokes the basic primitive "fight-or-flight" brain response which causes physiological changes such as diversion of blood from the skin to the muscles ready for some violent action. To make the finger warmer it is necessary to use imagination not will. Imagine putting the hand in warm water or near the fire. A change of 2 degrees should easily be obtained at the first attempt and much more with practice. If the meter reads over 35.5^{o}C, imagine the hand in ice cold water, to get a reduced reading.

Training thus, to increase hand temperature and decrease forehead temperature has been found to often result in control of migraine headaches. There are many simple medical uses of biofeedback. E.g. electrodes are taped on each side of a muscle such as the frontalis (forehead) muscle, and the signal from it is made visible to subjects with severe facial tics or with insomnia; by seeing the image of his muscle signals on the screen, the person is able to change it (simply by imagining it to change) which alleviates these conditions considerably. Similarly tension headaches have been treated thus, because frontalis relaxation is generally accompanied by similar relaxation of the scalp and neck muscles (5). It is however very important that one should be sitting comfortably and resting the head so that no muscular neck strain should occur due to bad posture.

Biofeedback can apply to a signal from brainwaves (EEG), skin resistance (which indicates relaxation), muscular tension, heart beat, skin temperature etc., and whatever is thus fed back to the subject can be controlled by him. Once the knack is learnt, the biofeedback machine is no longer necessary and can be dispensed with: the subject is the controller - not the machine. The more times the alpha or theta state is experienced, the more inner benefit is gained. Eventually the ability is gained to enter these states without the biofeedback machine connected.

All sound-and-light machines (discussed in the next chapter) inherently allow biofeedback, due to an effect discovered by Maxwell Cade (see next chapter).

CHAPTER 7

SYNCHRONISING OF THE LEFT & RIGHT BRAIN HEMISPHERE BY SOUND & LIGHT

Ancient ways for entering higher State of Consciousness by Light and Sound:

The effects of light and sound are not a new discovery. Before recorded history, the mesmerising effect of flickering firelight and tribal drum beats were noted for creating trance-like states; these have now been replaced by the beat of pop music and disco flashing units!

Ptolemy, in 200 A.D., recorded that the flickering of sunlight through the spokes of a rotating wheel can cause fascinating visual patterns and euphoria. Nostradamus in the 13th century gained visual images by quickly passing his opened fingers between his eyes and sunlight... . The thing that is new is the remarkable application of advanced electronics to this phenomenon.

Reported benefits of light & sound machines

♦Relaxation & Creativity:

- produce relaxation & relieve stress
- produce visual imagery
- exploring the subconscious - easy entry to meditative states

- fast achievement of deep meditative states
- increase creativity & inventive ability by bringing out the **intuitions** which cause all kinds of vitally important creative work, ranging from Scientific & Engineering invention to the composing of great music and Art
- achieve hypnotic states
- relief from insomnia

♦Educational

- produce high speed learning, even of boring material! This is of special value for students!
- improve memory
- increase I.Q.!
- equalise the activity of both brain hemispheres, to bring out latent abilities

Brain Activity

The brain consists of two hemispheres:
The **right** hemisphere is artistic & **intuitive**.
The **left** hemisphere is logical & **deductive**.

Many people are normally active mainly in the left (problem solving) hemisphere and their right (intuitive, artistic) hemisphere lies fairly dormant. To achieve our maximum abilities we need to balance our brain hemispheres' activities. Light & sound machines are very effective in placing both hemispheres into highly desirable **balanced** states with increased awareness & creativity.

Sound

Many years ago I visited Robert Monroe (7) in the Blue Ridge Mountains in Virginia (USA). He ran an institute for investigating consciousness. His institute has developed a method of changing both frequency and phase of sound waves. Listening to a sound pulse which is repeated at, say, 10 times per second, should 'drive' the brain into the alpha frequency, but because the mind soon learns to reject a repetitive noise (e.g. a clock ticking at night is soon not perceived), this method does not work. Monroe sidestepped this ability of the brain by applying a tone of, say 100 Hz to one ear and 110 Hz to the other, so that the beat or difference frequency of 10 Hz is produced in the mind and is not rejectable by the brain. This has proved to be a powerful technique. The most effective frequencies are in the low hundreds of Hz (e.g. 250 and 240 Hz to produce 10 Hz).

This beat frequency is very effective in balancing the hemispheres and driving the brain and at the beat frequency. The subject can be taken and held into any of the stages of sleep, from alpha through theta into delta and REM sleep (i.e. dreaming sleep). Monroe has taken out a patent on this method. By this means he set up an "explorer group" for 'astral projection' (7-12, 34, 37-40) at will. Incidentally, Monroe mentions that a focused but relaxed state of prayer or meditation can also produce synchronisation of the hemispheres. He believes that his method creates new neural pathways between the brain hemispheres.

Pre-recorded tapes are now available which produce such beat frequencies which can produce effects similar to light and sound machines in inducing the theta state etc. For further information on this effect of beat frequencies, see reference (31, 80).

More recently, The Monroe Institute has performed research into EEG mapping from brain areas (see back cover of book for a typical brain wave map after using a light and sound machine) and has made advances into binaural beat technology as described later in this chapter. Objective proof of the effect of binaural beats has been well established in many EEG studies, showing the brainwave state does change (131).

What are SOUND AND LIGHT MACHINES?
(more correctly called Sound & Light Devices)

There are several models. Essential components are:
1) a small control unit, 2) goggles or eyeglass frames that position tiny lights in front of each eye, 3) stereo head-phones, 4) stereo-tape input socket for effortless super-learning, 5) instruction manual. The control unit is a sophisticated micro-computer that regulates the frequency & intensity of the rhythmic pulsing sounds & flickering lights. Most control units contain pre-programmed sessions with various combinations of sound & light frequencies designed to help you reach desired states. Some units allow the user to create his or her own programmes.

Driving the Brain's frequency with Light & Sound

A light & sound machine uses pulses of slowly falling frequency which lead the mind from its normal waking consciousness to deeper, more relaxed states in which intuitive regions are reached. This frequency following is called 'entrainment'. Everyone can benefit from one or more of the features listed above.

Light & sound machines can facilitate entry to various brainstates in a controlled way. If some ***beta*** (wakefulness) is maintained while passing through the ***alpha*** (relaxation) state to the ***theta*** (imagery) state, then sleep will not follow uncontrollably. The remarkable properties of the theta state can then be consciously explored (rather than merely dreamed).

In outline, light and sound machines start at the beta frequency and slowly lead the brain frequencies down to the lower alpha & theta states. Leading further down to lower frequencies induces delta (sleep) in just a few minutes if there is no simultaneous stimulation of beta (wakefulness). The effect of several hours of normal sleep can be gained in about 15 minutes by using a light & sound machine to hold the brain in the delta state. The benefits of induced relaxation are very great, ranging from tension & stress relief to removing jet-lag travel effects. All light and sound machines allow dual users, with the correct matching eyepieces.

Bio-feedback from an EEG unit can be added: if one can immediately perceive the effect of entering a particular mental state, this is found to greatly enhance the ability to re-enter that state at will. This feature is available on some of the machines. However, as mentioned in Chapter 6, a form of biofeedback is inherently available in all light and sound machines (see Fig. 4.1).

Three basic requirements for brainwave entrainment are:
(i) resonance: the brain must be capable of oscillating at the desired frequency;
(ii) power: the driving frequency signal must have sufficient strength (i.e. sound volume);
(iii) constancy (isochronicity): the driving frequency signal must have its peaks equally spaced and must have a true "off" in between pulses.

If someone is highly stressed, he/she will have strong beta brainwaves which will not entrain to (say) 10 Hz (alpha). Such an anxiety state may be due to diverse factors like too much coffee, anxiety about the experiment or about one's job etc., or wilfully not letting the strobe be 'in control'. It is essential to make the decision to let the strobe entrain (drive) the brain's frequency. It is advisable to listen to a relaxation tape before using a light & sound machine. Alternatively, the strobe could be set to start near the subject's beta frequency (say about 24 Hz) and then the entrainment will be very much more effective than just starting the strobe at the desired end frequency (10 Hz). If a strobe were set at 12 Hz, which is (say) half the actual brainwave frequency of the subject, it would actually reinforce the 24 Hz (being its first sub-harmonic)!

Binaural beats from an external sound source can only be detected if the sound is < 1000 Hz (cycles per second), because below 1000 Hz the wavelength of sound is greater than the diameter of the skull. Such external sounds (< 1000 Hz) can curve around the outside of the skull by diffraction and can thus be heard by both ears, but because of the distance between the two ears the sounds are out of phase (i.e. the peaks in the sound waveform arrive at slightly different times at the two ears). This is why sounds < 1000 Hz can be accurately located & is why most animal sounds are < 1000 Hz (with some specialised exceptions). A phase difference causes binaural beats (interference frequency): see Fig. 5.1). However, if earphones are used to feed the two signals to each ear, there is no external physical sound wave interference as in Fig. 5.1, but the brain still detects a phase difference and the brain is thus forced to perceive an (apparent) beat frequency (the beats are not actually 'heard' but one thinks that they are being heard!).

Entrainment rule (i) above means that such a beat frequency must be < 30 Hz or it will not entrain the brainwaves. Subjects do not report 'hearing' binaural beats at above 30 Hz (129).

Each brain hemisphere has a sound centre which receives signals from each ear, causing two standing waves equal in amplitude & frequency, in each brain hemisphere, which entrain each hemisphere. There are more cross-connections however, than direct connections (i.e. the right ear has more connections to the left brain sound centre than to the right brain sound centre, and vice-versa). Thus, unusually, to specifically activate principally the right hemisphere (say) the volume of the hemi-sync signal to the left ear must be increased & that to the right ear be decreased.

The brain has vertical divisions as well as the horizontal division into hemispheres (this is explained in Chapter 10). Each vertical brain component resonates at a certain frequency at which it is conscious (130). The Monroe Institute has developed complex mixes of hemi-sync beat frequencies to activate these various brain areas in specific ways to achieve specific states of consciousness. Much valuable research has been done by the Monroe Institute; 'hemi-sync' is their registered trademark.

Their famous "Focus-10" state (mind awake, body asleep) entrains the cerebellum (controls body functions & muscles) to delta (sleep), and the cortex (seat of mind, consciousness) to theta (visual imagery, dream state). The cerebellum is first exposed to delta beats & the cortex later to theta. The subject becomes unaware of where his hands and feet etc. are, but does not lose consciousness (fall asleep). Such pre-recorded tapes are available. The user aims to eventually learn how to achieve various states of consciousness without the tapes.

Brainwave entrainment is not confined to the application of beat frequencies. It has been found that if a water bed is fed with a vibratory frequency, this will also entrain a

subject's brainwaves to that frequency. Light & sound machines are also very effective in entrainment.

Results of Entrainment by Light & Sound

It is well known that with flashing lights or stroboscopes, it is possible to drive the brain's electrical oscillations at the flashing light's frequency. Similarly, sound will drive the brain's oscillations. Infrasound, sound waves below the audible range, below about 20 Hz, is generated by some winds like the sirocco, and has very negative mental effects, well documented. Earthquakes owe part of their terror to the infrasound which they generate, which disorients the mind by disrupting the normal beta frequency in it. Old single-decker buses can sometimes have roof oscillation at around 10 Hz (cycles per second), which is not exactly audible but is manifest as a buffeting sensation which blocks out normal thinking. Infrasound weapons have been developed to disorient the thinking of an enemy.

A less objectionable use is in a disco where a strong sound beat drives the brain at a hypnotic frequency, in the theta/alpha range, an effect which is increased by the simultaneous use of synchronised flashing lights. A more objectionable use was the continuous round-the-clock powerful radio transmission known to amateur radio operators as "the woodpecker", which it sounds just like. These signals were the most powerful radio transmission in the world, of transmission frequency around 16 MHz, and they emanated from the USSR. Their repetition frequency of 10 Hz was in the centre of the alpha brainwave band. When the brain is oscillating at this frequency, thinking becomes impossible. The aerials of this transmitter were arranged so that these sinister oscillations could not be heard in the then Soviet Union, but could be heard everywhere else. This was a very unwelcome form of electromagnetic pollution.

In case you may think that radio waves do not affect us, it is known that certain radar frequencies are perceived, by everyone, as a hissing noise, apparently located above and behind the head. Depression due to mains 50 Hz frequency radio waves from power lines is discussed below. A few people can hear radio programmes in their head, without using a receiver. They thought they had become psychic, but actually this rare effect is due to a loose filling in a tooth, which acts both as detector (“cat’s whisker”) and loudspeaker!

The light and sound machines or 'mind machines' now commercially available for driving (entraining) the brainwave frequency, combine both flashing light strobing and synchronised sound beats which are very effective in driving the brainwaves to desirable states. One currently available light and sound machine, the Alphapacer, also contains a synchronised electromagnetic transmitter which is believed to enhance its effect.

The complex patterns seen are in the mind of the perceiver (5). Light and sound strobes are very useful to use before or during meditation.

People living near mains power lines become irritable and sometimes depressed; this is because 50 cycles per second borders on the upper part of the beta brainwave band. A big beta output from the brain is synonymous with a stress situation. So irritability is not surprising, if the brain is driven at a beta frequency by proximity to mains power lines, or even, perhaps, by night- long proximity to bedside mains-powered radios and lamps with mains flexes (112, 117-122).

Anthropologists have found that shamans use drum frequencies in the theta range to enhance their claimed ability to enter states of visual imagery. Music is of course well-known for its consciousness-altering powers; the brain-state of listeners is altered by the rhythms and frequencies used.

Gray Walter, the first modern researcher into flashing light reported, "The rhythmic series of flashes appear to be breaking down some of the physiologic barriers between different regions of the brain. This means the stimulus of flicker received by the visual projection area of the cortex was breaking bounds - its ripples were overflowing into other areas. Subjects reported lights like comets, ultra-unearthly colours, mental colours, not deep visual ones." These reports interested the novelist Burroughs, who investigated the effect and reported, "Subjects report dazzling lights of unearthly brilliance and colour. Elaborate geometric constructions of incredible intricacy build up from multidimensional mosaic into living fireballs like the mandalas of eastern mysticism or resolve momentarily into apparently individual images and powerfully dramatic scenes like brightly coloured dreams." Later researchers showed that the addition of synchronised sound beats greatly increased the effects (49). Chapter A (ii) in the present book further develops this.

Recently, an authority on anaesthesia, Cosgrove, commented that a light and sound machine is an excellent neuropathway exerciser**:** "The long term effects of regular use of the device on maintaining and improving cerebral performance thoughout life and possibly delaying for decades the deterioration of the brain traditionally associated with ageing, is very exciting. We plan to test this hypothesis in brain-injured patients where the degree of recovery has been proven to be related to sensory and cerebral stimulus, with the results having implications for long-term use in healthy normal brains." Other researchers have reported large proportions of migraine sufferers have had their migraines stopped by flashing light stimulation, with brighter light being significantly more effective. AIDS sufferers have received benefit in the form of improved immune function by producing states of deep relaxation in which visualisation of healing is enhanced (Harris, Penwell Foundation, USA)(49).

Harrah-Conforth has studied a control group who only received pink noise stimulation and a main group who received light and sound stimulation. He found that the latter group showed major alterations of their EEG patterns and brain hemispheric synchronisation. He reports comments like, "I lost all sense of my body", "I felt like I was flying", "I was deeply relaxed", "I felt like I was out of my body". He suggests that light and sound machines may cause simultaneous arousal of the sympathetic nervous system plus cerebral cortex and arousal of the parasympathetic system which is linked to "the timeless, 'oceanic' mode of the mystic experience." He concludes that these two states may be viewed as hyper-arousal (ecstasy) and hypo-arousal (samadhi) (49).

Recent research by Isaacs and Megabrain Inc shows that there is "very clear evidence of brainwave driving" by light and sound machines, with very strong correlation to the intensity of the lights used, both for red LEDs and incandescent bulbs. Dim lights have no brain driving effect (49).

Isaacs also found that during frequency-driving (entrainment) to lower frequencies, alpha is readily obtained but on driving lower the theta produced is often at a different frequency from the flashing light. He explains this as due to the brain becoming "used to" the repetitive stimulus and the reticular activating system (RAS, explained in Chapter 10) then steps in and blanks out the conscious perception of the lights. The result is that the brain then drops into the theta state.

This effect is confimed by the present author's experiments described here in Chapter A (ii), except that a theta flashing frequency used, caused a large delta frequency peak when the distracting flashing of the lights was removed by covering one eye, as described in detail in Chapter A (ii). This produced vivid images such as highly stereoscopic views of trees.

The effect could be related to that of the ganzfeld device (See Chapter 10) which obtains a blank-out effect by presenting a uniform featureless non-pulsing (steady) light which fills the entire field ("ganzfeld") of view (49).

Stress-related irrelevant jaw-muscle activity is a significant problem for some people, causing involuntary grinding of their back teeth while asleep. This effect is substantially reduced by the D.A.V.I.D. light & sound machine. Similarly dental research has shown that the muscular tension of holding one's mouth open (digastric muscles) against the jaw-closing (masseter) muscles, which often causes a stiff neck in dental patients, can be prevented by use of a light & sound machine at alpha frequency.

Chronic pain can be managed with light & sound machines (132) Reduced medication, lower suicide ideation, decreased stress, better sleep and other beneficial effects are reported. The findings are discussed in terms of endorphin production (see Chapter 5) and relaxation response.

Super-learning can occur in the theta state, with no problem of attention wandering or boredom! In this state, knowledge can be absorbed uncritically (whether interesting or boring) and at about 3 times the 'normal' rate. Self- made lesson tapes can be superimposed from your 'Walkman' onto the sound channel of a light & sound machine; an input jack is provided for the purpose. Users of such systems include businessmen & women, scientists, engineers, artists, music composers (because of the intuitive & creative abilities enhancement), students, hospitals, athletes, insomnia sufferers, people under tension & stress, people interested in exploring meditative states, etc.

General Information on Entrainment:

Flashing lights & pulsing tones cause a brainwave resonance in the visual & auditory cortex, which in turn causes resonance in adjacent brain areas. These areas in turn then cause resonance in further areas. This process is called the frequency following response, or 'entrainment', causing the subject to drift into a meditative/hypnotic state accompanied by muscular relaxation.

The brain will follow pulsing lights, pulsing sounds, pulsing magnetic fields and, most strongly of all, pulsing electrical waves when applied directly. Light & sound entrainment by themselves tend not to persist after the light & sound pulses are turned off, but do produce a genuine effect on brainwaves while on, which can be shown on an electro-encephalograph (EEG). Binaural beats as the sound source is more effective, but the effect also dissipates quickly after the sound is turned off. Only with some practice in meditation methods, can this dissipation be avoided. But the dissipation effect is found to be much reduced if pulsed electrical waves are applied directly to the body (similar to electrical acupuncture). The most effective waveform is pulsed pink noise, as used in the Alphapacer III+. Adding the other synchronous stimulations available (magnetic, light & sound pulses) increased the entrainment effect. Even short times spent daily, or less often, in a theta state will be very beneficial.

Biofeedback by Light and Sound Machines:

All Light and sound machines inherently allow biofeedback due to the following very useful effect discovered by Maxwell Cade (5)**:**

If red or green colours are observed, this means that predominantly beta waves are being produced. If white or yellow, then mainly alpha is being generated; if blue, mauve and deep purple are seen, then mainly theta is being produced. This is tabulated below.

This biofeedback will greatly help in achieving brainwave control, i.e. in learning how to alter one's brain-state to and from any of the 3 major types (beta, alpha, theta).

Low cost Sound and Light Devices:

Chapter A (ii) in this book gives the circuit and detailed instructions for building a very low cost and easily-constructed Sound & Light Device.
Caution: See the very last paragraph of this e-book.

Fig. 4.1

Biofeedback of brain-state:
Colours seen using Light and Sound machines and corresponding brainwave states.

Colour field perceived	Brainwave State
red	beta
green	beta
white	alpha
yellow	alpha
blue	theta
mauve	theta
deep purple	theta

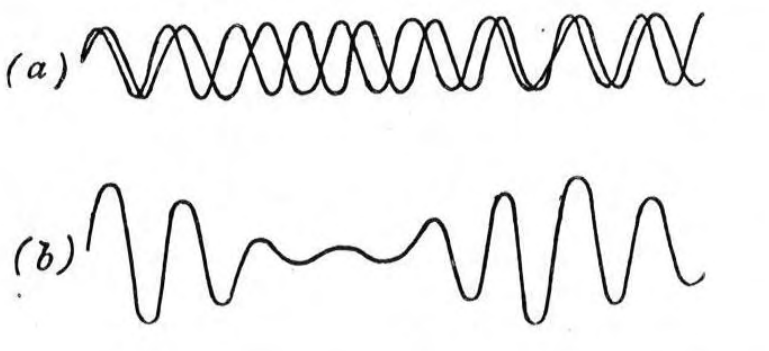

Fig. 5.1. (a) two co-existing waves of different wave lengths.
(b) resultant wave produced by addition of these waves.

Relaxation & Meditation Enhancement:

Experienced meditators produce a preponderance of alpha brainwaves and those with many years practice produce theta also (e.g. Zen & yoga methods). It normally takes years to achieve these states. Even such methods as biofeedback with an EEG display takes quite a while to master (but the effort is well worth while). The Alphapacer III+ and similar mind machines will help one to experience these relaxed and meditation-like states rapidly. It should be noted however, that single frequency electronically induced states will be similar, but not identical, to naturally produced meditation states because the latter do not consist of one brainwave frequency alone. Most mind machines induce one frequency, but there are some which induce two (and thence, by interference or beat, three). Fig. 2.1 shows EEG traces of correct meditation states with 3 frequencies: some beta, alpha and theta. Of course, just successfully inducing one is a big step forward from none at all!

Higher range alpha is useful for light relaxation and for fast learning. Lower alpha frequencies are ideal to induce deep relaxation & meditation. As the frequencies are lowered into the theta range many people experience imagery and an awareness of material from the subconscious. Deeper meditation experiences occur in this lower range. Access to personal creativity can also be enhanced by the induction of alpha and theta brainwave states. Greater integration of one's conscious and unconscious minds may also result from this conscious opening to deeper brainwave states; integration of awareness from left and right brain hemispheres is produced by the equalising effect of light and sound machines on the brainwave amplitudes from each hemisphere. This is an important feature for creativity.

Low sound frequencies echoing from monastery walls alters consciousness and causes brain biochemical effects. This eventually produces a state of enlightenment. Hence the chanting of monks, particularly Tibetan chants at very low frequency. The latter are available, for example, in 'Dorge Ling' by D. Parsons (137). This take many years and light & sound machines, beat frequency tapes and flotation tanks greatly accelerate the process. Instead of you meditating, they 'meditate' you!

Technical Comments:

Superbright red light-emitting diodes (LEDs) have a very fast switch-on brightness rise, which causes simultaneous firing of numerous retinal neurons. Some special white filament lamps are available with very fast rise times of 7 milliseconds (which is in fact faster than the eye receptors can respond).

White light flashes are more effective in reducing anxiety than red. There are divergent opinions on whether white or red light is more effective for entrainment. Red light is probably more effective than xenon strobe white light but this does not apply to fast rise incandescent lamps (which have a controllable 'on' time, unlike xenon strobes).

Red light is much more effective than other single colours for brainwave entrainment; this does not apply to special fast-rise white incandescent bulbs which are as effective as red LEDs.

An important feature is isochronicity of sound pulses, i.e. the pulses should appear at precisely the same time intervals (no 'jitter') and also the ratio of 'on' intensity to 'off' intensity should be at least 200 to 1 to produce brainwave entrainment.

Eyelids are very good diffusing screens, blurring point LEDs to a ganzfeld of wide uniform featureless lighting; e.g. if the sun is faced, with closed eyelids, a uniform ganzfeld is seen.

Stimulation of retinal cones of one type is reduced if others of a different colour sensitivity are also stimulated, but this effect may not be significant in comparison with other important factors.

A few light & sound machines allow different frequencies to be presented to each eye & ear, giving intermodulation with extraordinary psychedelic imagery. E.g. theta in one eye and beta in the other, giving "mind awake, body asleep" and other special states. The beat frequency produced generates enhanced states (e.g. from 15 Hz RHS & 10 Hz LHS, 5 Hz is obtained, which is, fortuitously, the theta frequency).
See Chapter A (ii) in the present book. The ”psychedelic imagery” referred to above is mainly geometrical patterns, but the method in Chapter A (ii) gives quite different visions, such a forest of trees with branches swaying in the wind.

Precaution: It is essential to allow half an hour after using light and sound machines and other mind enhancing units and tapes before operating machinery or driving a car.
IMPORTANT: See the Warning given after the references list (1 to 137).

Note on high volume music (e.g. that by Jarre) where multi-kilowatt outputs are used: Extremely high loudness will make the whole body vibrate. Much pop music is at a theta frequency and so this is an effective way of entraining the brain to that frequency, however with damaging side effects to the ear!. A similar phenomenon of whole body vibration can be achieved without the negative side effects of loud music using a specifically designed couch connected to high power vibrators.

CHAPTER 8

ELECTRO-ENCEPHALOGRAPH (EEG) UNITS

An EEG is an electronic detector which records and amplifies the signals emitted by our brain. Several electrodes are used. One is affixed to the forehead, two to the ear lobes and two halfway between the ears and the back of the head.

Grey Walter, in 1954, developed an EEG with 22 visual output channels. About 10 years ago, Maxwell Cade and Geoffrey Blundell produced a similar device which they called the 'Mind Mirror' (5). The output is displayed on a screen which one can be viewed thus allowing biofeedback (by imagining a change in the output which makes it actually occur and change on the screen). This has 12 channels (frequencies) for each hemisphere of the brain, i.e. 24 channels in all. Another version is now available. Although the results are very impressive, a disadvantage of EEGs is the need to hold electrodes onto the head to pick up the microvolt size signals there. This can be overcome by using dry self-adhesive electrodes behind the ears where there is a patch of bare skin, with a third electrode on the forehead. But then the electrical activity is that of the whole hemispheres rather than that from the occipital regions only, which latter is obtained if 5 electrodes are used [one (earth) on the forehead, two at the ears and two more about halfway between ears and back of head]. But any electrode in a region of hair cannot be a self-adhesive type and a wet gel pad is needed. Fig. 2.1 shows the type of display produced by the Mind Mirror (5).

Many years ago ther author attended one of Maxwell Cade's workshops where everyone had a chance to use a Mind Mirror EEG. The results of EEG biofeedback are impressive (5). EEG users should refer to reference (5), which also contains exercises for relaxation and visual imagery. Workshop: See Fig. 6.1 in this Chapter.

Some gifted people can produce advanced patterns on the mind mirror immediately - e.g. Sir George Trevelyan, founder of the Wrekin Trust, could immediately produce a big circle.

Note that "just alpha" is not really a meditational or inner awareness state because the latter requires simultaneous sidebands of theta and beta. Display of all these bands together (Fig. 2.1) shows the value of the Mind Mirror - to observe one's own pattern and get it into the proper multiband states by this biofeedback process.

Practical EEG Biofeedback Results

A typical aim is to generate an alpha output with the eyes open. This requires us to observe-without-looking (stare into space), i.e. disinterestedly. It is possible to learn how to hold this state and even answer simple questions without losing it. But the first step is to produce alpha with the eyes closed, of course.

The next step is the "theta reverie", in which a theta output is produced and very clear visual images appear spontaneously without us being aware of their origin or creation. This state corresponds to descriptions by geniuses of the past who wrote descriptions of their state of consciousness while at their most creative.

Alpha production can easily be learned with open eyes but initially theta is usually possible only with closed eyes. Theta images are so tenuous that open eyes drive them away.

Green and Walters in Kansas (4) have worked in this area. They made tests on a trained yogi, Swami Rama, from Rishikesh. He produced alpha simply by "thinking of an empty blue sky" and theta by "stilling the conscious mind and bringing forward the unconscious". He said **pure** alpha is literally nothing, but **pure** theta is a "very noisy" state in which things he should have done and associated images rushed up and shouted at him etc. In a **pure** theta state he was clearly a prey to suppressed worries in spite of his training. This is similar to experiences reported with psychedelic drugs, a state of visual imagery but with suppressed problems magnified and reflected back at one. The psychedelic drug state appears similar to the theta state that can be developed by EEG biofeedback. EEG training or the easier and cheaper light and sound machines and hemisphere synchronisation tapes offer an acceptable way to replace the drugs problem and this could be of immense importance. Swami Rama generally avoided a (pure) theta state. He demonstrated delta also, after 5 minutes lying down with his eyes closed. He repeated back some words which had been spoken in the room during his apparent sleep. He said that 15 minutes of this 'yogic sleep' as he called it is equivalent to an hour's normal sleep. He said in the delta state both his brain and mind were asleep, he told the mind to be quiet, not to respond to anything but to record everything, and to remain tranquil until activated. The Mind's Eye Courier light and sound machine has a 'jet lag' programme which makes use of the foregoing effect, but without needing years of yogic training.

Swami Rama could diagnose illness like Edgar Cayce except he was totally conscious but indrawn briefly while picking up the information. He said he wants to give a training programme for medical doctors. I have already mentioned that Maxwell Cade discovered psychic healing ability in people by looking for delta wave production.

When Swami Rama produced alpha he did not have to cease beta production. When producing theta, he was able (and preferred) to simultaneously produce both alpha and beta, each for about 50% of the time. Alpha is a conscious state and it may be necessary to keep it going when theta is produced, in order to be aware of and have some control of the imagery of the theta state. This idea is supported by research by Green et al who trained some subjects in Swami Rama's breathing method: this consists of deep and slow rhythmic breathing at a constant rate both in and out with no pauses at the top and bottom of the breathing cycle. After 4 or 5 months, with at least 10 days per month doing this exercise, their breathing rate could be slowed down to one or two per minute for 10 minutes. This agrees with observations by Wallace (5) that a considerable drop in metabolism accompanies the practice of 'transcendental meditation' (the system publicised by Maharishi Mahesh Yogi). Swami Rama took some EEG machines back to India and said they would speed up the training of yogis.

Swami Rama and others say that self-healing can be performed in a state of deep reverie. The Silva method is similar (18). Images for giving the body instructions are used while in the theta state. Theta brain wave training narrows the gap between the conscious and unconscious states. In the theta state the body can be programmed at will and the instructions will be carried out. Emotional states can be objectively examined, accepted or rejected or totally replaced by others, and problems which are insoluble in the normal states of consciousness can be solved. ESP abilities in the theta state have been developed by EEG biofeedback.

It may be helpful to link the names of states of consciousness to brain waves: concentration=beta, meditation=alpha, contemplation=theta, satori=delta(?). It is not

quite so simple; theta must be accompanied by some alpha and beta or consciousness is lost and sleep occurs.

Left-right hemisphere symmetry of brainwaves is long-term-improved by meditation and also, as Maxwell Cade found, by looking at a stroboscope. This symmetry adds your latent, intuitive and artistic abilities to your analytical and logical abilities, if you are an analytical type, or vice-versa if you are an artistic type. It has the same sort of effect as the alternophone or synchrophone of Lefebeure (24). It integrates your personality. The stroboscope has to emit orange-red flashes however, to be effective. This may induce abstract patterns or visual imagery as it DRIVES the brain at the theta frequency. It is better to start at the beta frequency and slowly drive the brain down to the theta state, but if anyone has a tendency to epilepsy it is necessary to avoid frequencies above about 16 Hz which could induce an epileptic condition in anyone who has epilepsy. In fact anyone with any type of seizure condition must take medical advice before using stroboscopic devices.

Wallace proposed that meditation (alpha) should be considered as a "fourth state of consciousness" and Goleman (5) proposed a fifth state in which the fourth state is infused into daily life. Alpha persists after the end of a Zen meditation practice. Maxwell Cade has held hundreds of seminars for EEG training. After about **4 hours** of training with the Mind Mirror the following results were noted for a large number of subjects (5):

1. All subjects, without exception, and usually at the first EEG training session, show a post-meditation phase with continuous alpha persisting about 10 minutes with open eyes (if the gaze is unfocused).
2. Alpha appears in two quite different states: One is pure alpha with only a few percent of other frequencies. This state is mindless, relaxed and neither thinking nor imagining. The other is high strength alpha with two continuous side bands (about 30 to 60% of the alpha amplitude) of steady frequency. One side band is beta at 16 to 18 Hz (waves per second) and the other is theta at 4 to 6Hz. This special alpha state is always symmetrical in both hemispheres of the brain. Subjects can open their eyes, hold conversations, and walk around. They can do mental arithmetic and experience self- induced emotional states, without losing the state. 'Testing' the state causes it to stop after about 10 minutes but it can always be restored by the subject adopting a passive attitude for a few minutes. Maxwell Cade believes this state is Goleman's "fifth state of consciousness".

If you want to read accounts of this "fifth state", see references (16,17 & 21). Paramhansa describes the transition from fourth to fifth state, called savikalpa samadhi and nirvikalpa samadhi, respectively. In the fourth state, a temporary realisation of oneness with Spirit is obtained but this 'cosmic consciousness' can't be held except in the immobile trance state. By continuous meditation the higher fifth state (nirvikalpa samadhi) is reached in which one can move freely in the world and perform one's duties without any loss of 'God-perception'. This transition can occur rapidly or take years, depending on the state of the nervous system of the individual. One attribute of the fifth state (22) is that pure awareness infuses the waking state and also the dreaming and sleep states. One can witness oneself entering the sleeping and dreaming processes, just as one can witness thought in meditation. This aspect of mind is called "The witness" by Gurdjieff (19).

Sleep & deep meditation are described as dissociative states by Atwater (131) and are accompanied by alpha suppression. "Resting state alpha" is alpha brainwaves confined to the back of the head. In a dissociative state, this alpha is suppressed

which frees he mind from normal belief systems and opens the doors of perception to non-physical energies (131).

"Transcendence" is a further stage beyond dissociation, where one is beyond the limits of the ego and unconscious mind and into universal awareness. Experience of this state can alter the nature of the subject's reality (131). EEG maps show high amplitude delta and theta.

Cade & Coxhead (5) give an alternative description, described above, in terms of a "fourth state" (probably similar to the "dissociative state" of Atwater (131) and a "fifth state" (probably Atwater's "transcendence").

Procedures

Maxwell Cade found experimentally that obtaining the fifth state of consciousness is aided by special excercises to develop detachment. Subjects who can already produce continuous alpha or theta, to order, were trained to maintain these rhythms while visually scanning the surroundings, solving successively more difficult arithmetical problems, experiencing self-induced sensations of no-emotion, anger, hate, grief, love, joy and reverence, and finally walking about, and conversing with other people (while still maintaining the EEG pattern).

It must be emphasised that the brainwave state to aim at is not just pure alpha or theta, but is alpha ACCOMPANIED by unvarying side-bands in the theta and beta regions. The former states are, however, essential stepping stones to the latter fifth level. Before starting the exercises it is essential to go mentally up or down the body, relaxing all the muscles one by one.

Then the next step (using the Mind Mirror EEG, in this example) is to produce continuous alpha and theta by, for example, passive concentration on breathing. Breathing is the only body function that can be entirely automatic, as in sleeping, or entirely under mind control. It is used in many meditation systems just because it is a pivot between voluntary and involuntary control. The breathing exercises of meditation in which the breath can be imagined like a swinging door, have a hypnotic effect; one breathes at a frequency in the delta range.

Then incremental stressing can be used to infuse the alpha or theta with one's normal activity (5):

1) (a) Open eyes; look slowly and disinterestedly around the room without focusing on anything. If the alpha signal disappears, rest and allow it to return. Do not restart these stressing exercises until the signal has remained steady for at least 30 seconds.
(b) Focus eyes sharply on various objects.
(c) Make eye contact with other people.

2) Solve mentally some simple arithmetic problems.

3) For 2 minutes each, feel each of these 7 emotions (=1 cycle); then repeat the cycle: (a) no emotion, just calmness; (b) anger; (c) hate; (d) grief; (e) love; (f) joy; (g) reverence.

4) Pick up your EEG machine (or as appropriate) and walk about talking to people. Stop and rest with closed eyes if you lose the signal.

Experience at these levels leads to permanent changes. With practice you can also recognise what brainwave state you are in, **without being connected to an EEG!** (The ultimate in biofeedback).

Most people do not have symmetrical left and right brainwaves patterns but only a few hours of meditation leads to symmetry - the balancing of the logical (left) and the intuitive (right).

Green et al describe a theta training project with a group of volunteers (4). To prevent them from drifting off to sleep (i.e. losing all of their beta), they used a type of alarm clock which would ring unless a bar on top was pressed which advanced the alarm setting by 7 minutes. Portable EEG's were lent to the volunteers who practised about an hour each weekday recording observations in a notebook. They were asked to increase the amount of theta produced and to report the visual imagery. The imagery was classified into 7 groups:
mental events, physical events, symbolic content, personal content, transpersonal content, extrapersonal content.

Most subjects could easily increase alpha and increase theta with more difficulty. There was a big increase in the imagery. Many students reported integration of their personalities and increased vitality occurring with alpha- theta training. Memory and concentration also improved. Some reported an increased awareness of nature - colours, wind, trees, sky. Archetypal images were reported by many, such as:
travel through tunnels, up and down stairs, images of eyes, images of a wise man or of a book of knowledge.

There was increased awareness and recall of dreams and of forgotten events of childhood. These were not a memory but a **re-living** of the events, complete with sounds and smells and with great clarity.

ESP observations of events were also reported, including distant vision (Remote Viewing) (4).

For later advances in fast methods of seeing imagery, see Chapter A (ii).

Fig. 6.1.
Students during an exercise in one of Maxwell Cade's classes in the 1970s, with Maxwell Cade and Isabel Cade, centre.
Total attendance: 4000 people.
Each student is wired up to both a Mind Mirror and an ESR meter showing their physiological responses as they go into deep relaxation.The Mind Mirror EEG is the unit in the lower right.
The red bars each contain 16 LEDs. There are 13 red bars of LEDs for the left and 13 for the right brain outputs.
Some results are shown in Fig. 6 in Appendix 3 of Chapter A (ii). Pictures of the Mind Mirror unit and other information are available in internet references at the end of Chapter A (i).

CHAPTER 9

PATHWORKING

(this is important information)

Some background to this is given in Chapter 4, in the section on visual imagery.

Entries to the so-called astral level depend on visual imagery, developed by various methods. One method is hypnosis; in hypnosis visual images are easy to develop. Another way is through the Tarot, or other pathworking doorways (11,23,26). One has to create a picture of the doorway as a visual image and then imagine one's-self moving into it, to reach the astral level.

Chapter A (ii) in this book gives a rapid entry to imagery which is a basis for pathworking, where one can move out of the usual initial visions of trees and into more open clearings and also one can slowly rise upwards for aerial-type views and with practice and patience distant towns can be seen, while wide awake but with eyes closed. This method can be used as an easy alternative preliminary to use of the methods given by Ashcroft-Nowiciki (23) which are outlined below.

The series of books by Ashcroft-Nowicki (23) is highly recommended, along with reference (11). The method is to perform relaxation and breathing exercises. These can be very greatly enhanced by entering a theta state using a light and sound machine, a CES unit (see Chapter 11), or beat frequency type of tape, or a flotation tank (Chapter 10), before going on to the next stage. Light and sound machines have an input socket for tape (or any audio) recorder input and this can be used with a pre-recorded tape of the pathworking text given by Ashcroft-Nowicki, which involves imagining an old wooden door with massive iron hinges, seeing every detail in the mind's eye. Through the door is a wild moorland on one side and on the other side a

set of cliffs washed by a grey, wind-tossed sea. You next lock the door, placing the key in your pocket and a detailed pathworking journey follows (23), using ancient archetypal paths defined (for example) by traditional tarot cards' scenes (Fig. 6.2). Tarot card no XXI is an 'astral doorway', the path between Malkuth (Earth) and Yesod (astral or dreamworld) in Kabbalistic terms (103). After this, returning through the door and locking it behind you, it is important to ensure that you are fully back in your own space and time. Feel the chair and floor beneath you, get up and walk around and have something to eat and drink. Eating and drinking is the quickest and safest way to close down the doorways to the imagination or to unknown "inner worlds" after an inner exploration.

Surprising revelations from your deep subconscious may be obtained by this method, even if you are not familiar with the tarot.

Paraliminal audio recordings are a recent invention in which one ear hears one story and the other another, simultaneously, but these have not yet been developed for pathworking.

Another entry to the astral level is by interrupting a dream while asleep. During dreaming the emotional disturbance caused by the dream produces an increase in breathing rate. A temperature sensor called a thermistor can easily be attached to the nostril with adhesive tape and it changes its resistance with temperature; one's outbreath is warmer than the inbreath. The thermistor's resistance changes are measured and when these changes exceed a preset frequency (due to faster breathing) another circuit delivers a very small electric shock to a wrist band and the dreamer is thereby alerted IN the dream to the fact that he IS dreaming and he can then become self-conscious in the dream. An alternative to a nasal thermistor is a ribbon around the chest with an (inexpensive) flat strain gauge on it, whose resistance changes with each chest expansion (breath). This and a more convenient recent electronic device which requires no sensor at all to be worn while asleep, is discussed in Chapter A (i) in this book.

Dreams occupy about 20% of total sleep time, about 90 minutes each night. During dreaming, rapid eye motion (REM) occurs. A commercially available unit ("Dreamlight") uses the direct method of sensing eye motion electronically and immediately sending a train of flashes to a tiny light (LED) fixed in a simple mask (like the ones issued on air flights to exclude light, for those who wish to sleep). The person wearing this mask will then see, in the dream, a brightening-up of the scene or perhaps flashing jewels appear (or some other event) which will trigger off the memory of wearing the mask before sleeping with the intention of becoming aware in the dream. Then immediately, the dream becomes vivid or lucid and the dreamer becomes aware and can control instead of merely being a bystander. The effect is remarkable and the experience is highly recommended. But having to wear a mask containing small flashing LEDs can be avoided by a recent method described in Chapter A (i) in this book.

Chapter A (i) and Chapter 5 list some websites with lucid dreaming information.

The benefits obtainable from awareness during dreams were outlined in Chapter 1. Some useful references are (7-11 & 32- 40). Reference 34 has been verified by an acquaintance of the author to produce results.

For a further comment on pathworking, see the last pararaph in the Conclusions, (after Chapter 11).

CHAPTER 10
SENSORY DEPRIVATION - FLOTATION TANKS

DISCLAIMER:
This book contains descriptions of what the **author** did & experienced, and what **others** have reported (as referenced). No responsibility is accepted for any use of flotation tanks, nor if any of the information in this book is applied practically. Any instructions/procedures were written by the author for his own use, and their appearance in this e-book is not a recommendation for them to be used by anyone else. No responsibility is accepted for any adverse effects.
See also the WARNING/CAUTIONS section on page 188 of this e-book.

"Silence is the gateway to the Soul;
The Soul is the gateway to God."

NOTE: References for this chapter are at the end of the chapter.
New users may tend not to relax if they think they may drown if they fall asleep while floating in water. This will prevent the benefits described in this chapter. But reports say that falling asleep is impossible because the tank uniqely combines deep relaxation with intense conscious awareness.

This is a simple effortless method for obtaining first-hand visionary experiences and insights. It is a great improvement on the traditional monastic method of simple "silence".
See also Appendix 7(b) for another method; see especially: T. Yuschak, "Advanced Lucid Dreaming", ISBN 978-1-4303-0542-2 -- **Highly recommended reading.**
It covers use of herbal supplements (which, unlike narcotic drugs, do not alter one's waking behaviour & so are morally acceptable) to produce immediate lucid dreams and OBEs, including seamless transition from waking to lucid dream-state consciousness. See Appendix 7(b) for present author's (MGH) comments on suppliers.
See ref. [137] for other important details not included in this present book.

Flotation tanks

This section tells of the remarkable effects obtained from a very simple procedure: merely floating on 10 inch deep pool of water in a dark enclosed chamber less than 8 feet by 4 feet in size (Fig. 7.1).
Of all the methods described in the above book, this and CES (cranial electrical stimulation) are the most universal in their effect.
A flotation tank is perhaps comparable to the ancient "mysteries", like the Elusinian Greek Mysteries, etc, but is not secret.

Sensory Deprivation:

At first, the mind will do anything to prevent the removal of the sensory input to which it has got used. Research has been done on

the effect of sensory deprivation on volunteers in a black room [25]. People stay in a totally black room in total silence. After an initial long period of sleep their brainwaves drop to lower frequencies spontaneously. They see bright visions. A faster method is to float in a bath of very dense solution of Epsom salt in water controlled at normal skin temperature, in the dark and silence. This removes all the senses (touch, sound and vision) and one has no sensation of even having a body because its boundary (the skin) cannot be sensed. Remarkable results have been reported [6,2,41].
It might be thought likely to be boring, but it is not!

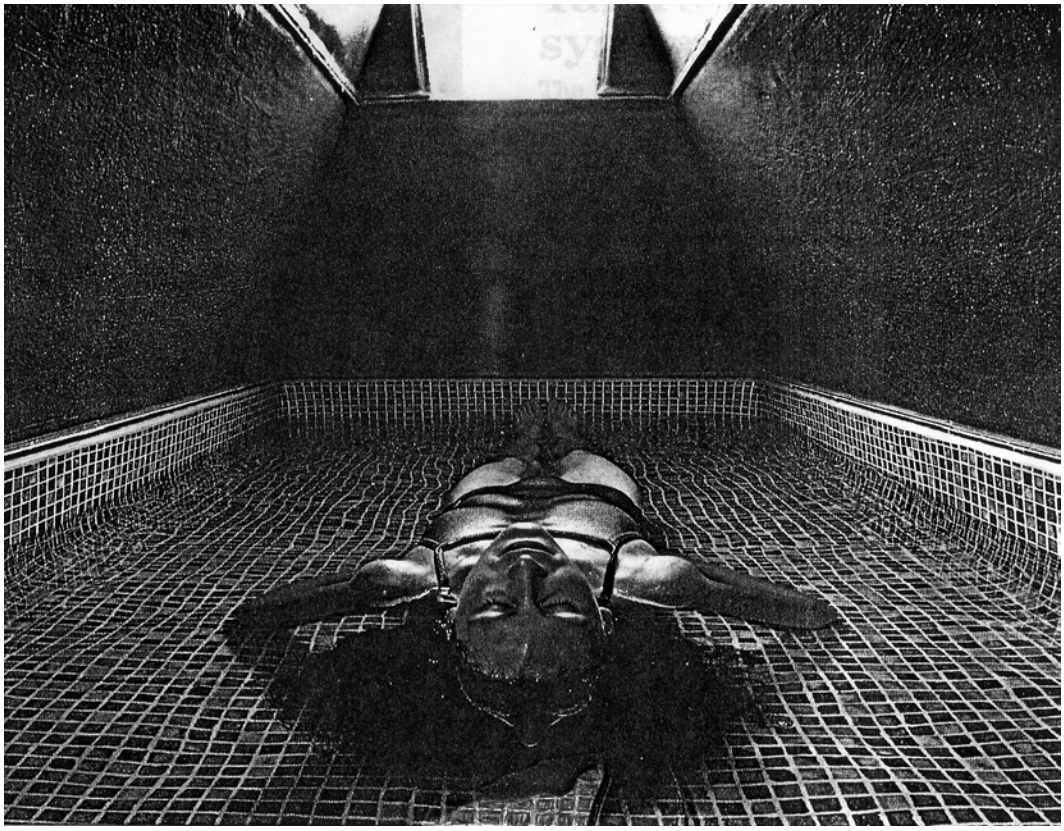

Fig. 7.1. Flotation Tank (picture: courtesy of Visionary Designs, Brighton, UK)

Contains 700 litres of water and 500 kg of $MgSO_4 .7H_2O$ B.P. (Epsom Salts) to give buoyant floating. (B.P. = British Pharmacopoeia grade, possible supplier: William Blythe Ltd, Church, BB5 4PD).
Water temperature = 35ºC (= skin temperature).

<u>DIY Caution</u>: floor loading!

Total darkness and silence are essential for <u>complete 5-sensory deprivation</u>.

The flotation tank has water only 10 inches deep but it contains 800 pounds weight of Epsom salts to give extreme buoyancy. An air pump provides ventilation. The optimum water temperature of 93.5ºF is maintained by a thermostat. At this temperature it is impossible to feel the water (by its temperature) and so you cannot distinguish where your skin ends and the water begins! Also, in a fluid you have no sensation of any pressure (unlike lying on a bed). Such floating completely removes the sense of touch. It is comparatively easy to remove the other senses (vision - just keep out light; sound - just keep out noises; taste - just don't eat!; smell - just don't have any scented materials around). Clearly, of the 5 senses, touch is the most difficult to avoid. It requires a flotation tank.

Flotation feels like being weightless in black silent space and it is difficult to know if you are on your back or front or vertical. But there is no vertigo or discomfort nor any kind of claustrophobic sensation. As each part of one's body becomes relaxed, it seems to vanish from awareness until there is nothing left but consciousness. It is an almost indescribable experience, unlike anything else whatever. Soon after this, visualised events brightly appear, often scenes from childhood.

On emerging from an hour in the tank, the world seems to have changed in your absence! Things are seen anew - the world is fresh, illuminated, glowing bright, luminous, intensified. William Blake described such an awareness as "cleansing the doors of perception"; see Aldous Huxley's book of this title [1]. Tests on subjects of sensory deprivation experiments show beneficial results such as increased visual acuity, tactile sense, auditory sensitivity and taste sensitivity, lasting up to 2 weeks [41]. Improved learning, memory, IQ scores, perceptual motor tasks, enhanced visual concentration and increased short term visual storage also resulted.

Some physiologists estimate about 85% of our brain's activity is spent in dealing with balance and counteracting gravity. The effect of gravity is annulled in flotation and this releases a large proportion of brain activity. This quasi-release from gravity also allows blood circulation more freely, reaching parts not well-supplied due to cardiovascular constriction (due to smoking, cholesterol clogging, tension, etc.) and this reduces the effort needed by the heart. The blood pressure falls beneficially and the pulse rate slows. Relief of

gravity-caused pressure on joints etc. will alleviate temporarily chronic pain due to arthritis, sprains etc.

Lilly & Shurley were the pioneers of flotation [6] and laid the foundations, but following Ptolemy's 1800 year-old account of the mental effects of a stroboscope (his spinning spoked wheel between closed eye and sun), one is tempted to speculate on the use of the deep sarcophagus in the Great Pyramid which can still be seen there, and in which one can lie [100, 111]. There is nothing new under the sun...[42]!

The granite coffer in the Great Pyramid is over 6 ft 6 inches long and over 2 ft wide (internal measurements) and is too wide to go through the door. Clearly it would not have been removed by those who put it there, so the inference must be that they did not want 'those who came after' to remove it either. One may then speculate that they 'built it in' to be an 'indelible message' for those who came after. As a speculation, could the message be a recommendation to use a flotation tank to gain very easily the enormous benefits of deep meditative states?

To speculate further, the Coptic Christians in Egypt are the lineal descendants of the Pharaonic or Osirian religion of ancient Egypt, founded by Thoth: Isis (or Asset), the mother of Horus, was later replaced by Mary. Coptic churches contain large fonts. Churches across the world contain fonts; are these a 'folk-memory' that a religious building should contain a flotation tank? It is very likely that flotation tanks were used anciently as part of initiation procedures, but were kept secret and have since been forgotten. The Egyptian Mysteries were transmitted onwards to become the Greek (Orphic) Mysteries and were later passed on to Rome before almost disappearing in the Dark Ages.

Lilly [6] reports that he could control various states of consciousness while floating, such as waking dreams (vivid daydreams); events could occur with such brightness that they seemed real and could possibly be mistaken for events in the outside physical world. Truly an 'astral doorway' [see references 34, 37-40, 12, 7-11].

Meditation conventionally (with no equipment) takes many years to achieve. To 'achieve' means, in measurable terms, the ability to go

into a state in which the EEG trace is symmetrically bilateral and includes a small beta peak accompanied by larger alpha and theta peaks; see Fig. 3 & 4 in Chapter A(ii).
But in a flotation tank these years of preparation (which overcome the external stimuli of touch and the other senses) are completely removed! It is 'instant mysticism'. People can go almost immediately to deep levels of meditation and contemplation [41, 72], often on the first float but several may be required.

Psychological problems have also been rapidly solved in the tank: an acutely shy person became able to perform confident public speaking, to his amazement [41]. Depression is linked to raised levels of pituitary and adrenal activity; floating is associated with decreases in these two activities. Hence it relieves depression.

Pain is substantially relieved by flotation and rates of recuperation increased. This includes cases of psychological damage as well as physical. Lawyers report greatly enhanced ability to marshal facts for cases during flotation, resulting in impressive results; this clearly can apply to any kind of job requiring mental organisation [41]. In some cases even non-religious people have described flotation experiences as 'religious experiences'; it is clear that something very unusual indeed is occurring while floating in the tank.

Green [4] points out that to produce theta consciously, it is necessary to have a quiet body, emotions and thoughts, simultaneously. It takes Zen monks some 20 years, but the flotation tank does it all for you in minutes! Studies have shown that after only 1 hour the theta level is significantly raised (without sleep intervening) [41]. The tank is ideal for maintaining wakefulness while in theta [74]. This is a very important remark. The tank is thus ideal for promoting creativity, as an example for the outer world; or for deep meditation, as an example for those interested in the inner world.

Maxwell Cade [5] discovered from studies of over 4000 people that unusual abilities like self-control of pain, healing, telepathy etc. are associated with changes in EEG pattern to a bilaterally symmetrical form [5] (see Fig. 3 & 4 in Chapter A(ii)). Other workers (and Maxwell Cade) [76-78] found the same thing for those in deep meditation. The same happens during floating; the tank does not block left brain

activity but makes it a partner with the right brain, whose activity floating brings forward [41].

Before trying floating, many people think it must be boring. In fact the opposite of boredom occurs. One floater said that every time she floated she felt like an explorer or adventurer and was proud of herself [41]: "Consciousness - the ultimate frontier".

Some suggest the tank experience has obvious parallels with a return to the womb. Babies have theta brainwaves. Tanks cause increased endorphin levels [79]; for comparison pregnant women have up to 8 times the usual blood endorphin level. Endorphins, like heroin and morphine, relieve pain and create euphoria.

An alternative to the "return to the womb" parallel may be replaced by a return to the paleontological environment of our distant ancestors, living in a warm sea [41].

Relaxation in the Tank

A common experience on entering the tank is to try hard to relax and not succeeding; but then, on just giving up trying, relaxation comes immediately! Relaxation comes without any effort being needed, very unlike in the world outside. Any efforts in the tank will cause hindrance. Biofeedback workers know this as the 'Law of Reversed Effort': whatever you "try" to do, the opposite result will be obtained. See the example given under BIOFEEDBACK in Chapter 6 - making one's finger hotter/colder. Like users of biofeedback machines, floaters soon learn the knack of 'letting go'.
This knack becomes a 'body memory' and a familiar deep relaxation occurs in minutes after entering the tank [41]. This state, once entered, is then ideal for beginning various techniques, such as: self-hypnosis, visualisation, healing, meditation, etc. and these work much more strongly in the tank. But the best advice is to set no such goals for the first few floats [41].

Precaution: Do not touch your eyes, as salt will cause great discomfort and cause you to end the session.

Deepening relaxation in the tank: Imagery

While avoiding the pitfall of over-trying to relax, just mentioned, focusing the mind on breathing helps relaxation. Relax the abdominal stomach area muscles. Try concentrating on the coolness at the tip of the nose on inhaling, and then the warmth there as you exhale. Try counting these from 1 to 10, repeatedly. Do not resist random thoughts but allow them to dissipate away.

Try concentrating your being in the centre of your forehead on a count of 1 breath. On breath 2, concentrate your being in your throat; 3 - right shoulder; 4 etc. - right elbow, wrist, each finger and back up arm to throat; similarly left arm; chest; abdomen; pelvis; right leg - toes - back up to pelvis; left leg; return up abdomen, to forehead. Each part will probably become warm and glowing as tension is released. Deep relaxation is achieved [41, 4].

Especially if you are a 'non-visualiser' type of person, practice visualising things while in the tank - e.g. a daffodil. You will find this remarkable and profitable acquisition with many varied applications.

The above nose-breathing exercise can be combined with a visualisation to increase its effectiveness:

Visual imagery in the tank can be facilitated as follows [41]: As you breathe in, visualise a pure white light entering your nostrils and going into your lungs and abdomen, thence radiating out to all parts of the body. On breathing out, imagine the reverse of this process. Exclude all thoughts from your mind except breathing.

On the in-breath, imagine the life-giving power of the oxygen and on breathing out imagine that as dark blue or grey, containing toxins, fatigue etc. which are being expelled. With this process, your body will slowly increase in brightness with time until the tank is filled with bright light.

A variant is to focus on a particular area of he body and visualise that as warmly glowing. This could be, for example, one of the chakras [113].

A further exercise in control of imagery is to imagine, for example, a blackboard and to 'see' on it various coloured shapes, such as a sphere, cube, pyramid, etc. Try a red triangle against a blue 'blackboard'. This is ideal for the so-called 'astral doorways' (11), which have well-defined shapes and colours, and as preparation for the Tarot astral doorway (Fig. 6.2).

You can also 'see' familiar cartoon figures from TV and imagine them dancing about.

An advanced visualisation is to imagine yourself getting smaller and smaller (like Alice in wonderland). Such visualisations have been described many centuries ago by Patanjali [114], who indicates that a trained observer may be able to observe atoms. A century ago, trained meditators reported using this (claimed) ability and drew string-like pictures of what may be recognised today as strings of quarks. The author has discussed this extensively elsewhere [115]. If such an ability can be developed, it would have profound scientific consequences.

Similar visualisations stopping at the cellular level are the basis for the healing described below and in Chapter 4. Visualise entering your body and visiting various organs.

Further revealing visualisations are [41]:

(1) Visualise someone well-known to you, face, skin texture, hair colour, eyes; see effect of a smile, of him/her moving, speaking (hear his/her voice) - note what is being said: probably important.

(ii) Visualise your own face; smile; notice all details. Anything you don't like? Visualise in some activity - like climbing. Let the image speak to you - what do you hear?

(iii) Visualise yourself in a scene from childhood.

The results of such visualisations will often surprise you and will reveal directly what is hidden in your mind.

Self-Hypnosis in the tank

Under self-hypnosis in the tank, Hutchison describes a successful self-diagnosis which proved correct (in [41] page 138). The tank is ideal for self-hypnosis, which requires deep relaxation and focused

Fig. 6.2

Tarot Trump Card No. XXI
An "Astral Doorway"

From A.E. Waite Tarot deck.

The method given is to imagine one's self moving through the gap between the figure and the surrounding wreath, to enter the "astral" world of dreams.

attention. People highly resistant to hypnosis and self-hypnosis can be hypnotised in the tank [135, 136].

Children are right-hemisphere active, and if admonished by a parent saying "You're no good" etc, then this effectively powerfully negatively programmes the child and he/she needs to be deprogrammed later in life to remove the hidden blockage caused. This can be done under hypnosis or self-hypnosis. For self-hypnosis, try the standard method of counting backwards, but in the tank you will not need to count from 100 to 1 (conventional) but only from 10 to 1 due to the tank-conferred relaxation effect. Consult the many books on self-hypnosis for further details of procedure. Use the present tense in all hypnotic suggestions; try to image beneficial suggestions as being already true and make them as positive not negative ones (i.e. avoid using the word "not" in a suggestion) [41]. Link them with an image where possible, for added power.

Suggestions are more effective if accompanied by stately, flowing melodious and light gentle background music.

For medically permissible pain relief, e.g. arthritis, imagine a bright light focused on the area, while in the tank [41]. Floating has surprising and durable analgesic effects, due to endorphin release.

Superlearning

Many studies have conclusively demonstrated [41] that in a state of deep relaxation and focused attention, a state of hyper-suggestibility is reached where very fast learning of large amounts of information is possible. The tank is ideal for producing this state, due to the RAS 'turning up the volume' and to unusual access to the right-brain [41]. ("**RAS**" is explained below.) Light & sound machines can also perform this function, by placing the brain in the theta state.

In a survey [41] with a control group and a float tank group, taped chemistry lessons were heard, containing: (a) basic information, (b) application, (c) problem solving. Results showed floaters were better than the control group for (a), much better for (b) and very much better for (c). EEG traces showed greater theta waves during flotation and this was shown to be related to the depth of

understanding involved. It was also found that visualisation helps learning [41].

Lozanov [83] has invented a (non-tank) superlearning system in which a deeply relaxed state is invoked and while rhythmically breathing, the students listen to lessons spoken against slow background music [82]. The book, reference [82] is recommended as applicable to tank learning also. The deeper the state of relaxation, the more the student can learn.

There are Flotation Tank Associations -- see on the Internet.

The relation of human brain evolution to Flotation:

The human brain evolved in 3 stages:

(1) the brain stem, from the reptilian period, (2) the limbic system (mammalian) and the cerebellum added to the stem, (3) the higher cortex. The last two of these are divided into left and right hemispheres. For more details, see reference [44].

A psychologist [70, 71] has remarked that the brain is hindered by a 'design error' - not enough communication between the higher cortex and the two older levels of the brain. This is a quite separate effect from the left/right hemispheres of the cortex; this lateral split is bridged by the corpus callosum and although industrial culture has caused left brain dominance, this can be corrected (there are ways to integrate and synchronise the left and right brains, as explained in this book). But the vertical division has few and slow connections.

In the (primitive) brain stem from the reptilian period, there is the 'reticular activating system' (**RAS**). This sets the arousal or awareness level. In the (advanced) cortex, all our advanced mental functioning occurs but the RAS is essential to keep the cortex awake. Consciousness is impossible if the RAS is destroyed.

Input from the senses to the cortex are passed to the RAS. If these signals are too intense, the RAS 'turns down' the brain's level of awareness (arousal state); if this fails, anxiety states occur. Conversely, if inputs from the senses are very low, as in sensory deprivation, then the RAS turns up the awareness of the cortex. This is the principle of the ganzfeld effect and of flotation tanks.

A ganzfeld device is an optical system which presents a uniform featureless light field to the eyes. As the RAS turns up the gain, visions may present themselves which otherwise would be swamped out. This effect is enhanced by simultaneously listening to "pink noise" on earphones. A primitive ganzfeld device is to place a half Ping-Pong ball over each eye to give a uniform featureless light field. Commercially produced more advanced ganzfeld devices are available. The RAS also 'switches on' the cortex during the sensory deprivation of sleep; visions occur (dreams), but as the brain's awareness level in sleep is very low (no beta waves), these dreams cannot be manipulated. Electronic units described in Chapter A (i) are designed to overcome this and convert the dream to "lucid".
Meditation while we are awake is the manipulation of the RAS to create reverie and higher states of consciousness, with awareness. Floating in an isolation tank has a strong effect on the RAS, causing deep relaxation combined with great alertness - a very unusual state. The sensory deprivation caused by the tank causes the RAS to 'turn up the volume' on all the senses, bringing even the involuntary functions like heartbeat under conscious control, thereby achieving a unity between the reptile brain (RAS), limbic system (autonomic system) and neocortex (conscious awareness and voluntary control) [41]. After some time, subliminal visions may begin to present themselves.

Hutchison [41] points out that paradoxically, the RAS also interprets the experience of floating as a type of sensory overload on some channels and so responds by causing deep relaxation. Hence the unique result of floating is deep relaxation with intense conscious awareness.

Floating also causes the limbic system to inhibit stress hormones such as epinephrine and adrenaline, while increasing the production of endorphins which are beneficial neurochemicals. This results in a reduction of anxiety and induces euphoria, and helps the cortex to synchronise its hemispheres, to generate theta waves and visualise, etc. Habitual, chronic stress has replaced earlier primitive threats like loss of life, territorial combat and starvation, and modern man is in a perpetual state of non-specific arousal [128]. Many experts consider about 85% of all illness is stress-related. In the flotation tank there is sanctuary from stress situations: there are no other people, no noise, no light, and nothing that needs doing; in this absence of

threats, body chemicals return to (better than) normal and one has the chance to examine one's life calmly and objectively.

Tank treatment is not passive but has an equal and opposite effect to what any stress could have. Hutchison [41] points out that our Judeo-Christian ethos imbues a tendency to regard relaxation as something opposed to productive activity: if you're relaxed this means you're not performing any worthwhile activity! Its apparent wasting time and laziness aspects makes it appear to be a luxury.

The limbic system atop the brain stem is responsible for some effects of altered states of consciousness such as euphoria, feelings of divided consciousness, loss of awareness of body boundaries, feelings of floating or flying and strange visual experiences like white or golden light [5].

Most people have been taught to avoid solitude, isolation and confinement. TV sets are anti-isolation devices! So most people have a negative attitude to solitude and isolation [6]. It is thus necessary to make a (small) mental effort to overcome this feeling.

In Summary, the benefits of flotation are:

- Floating stimulates endorphin production, described under CES, in Chapter 11. It quickly and considerably reduces stress and anxiety and reduces any tendency for heart disease and other stress-related illnesses by lowering the levels of stress-related biochemicals.

- Floating immediately brings forward the right brain hemisphere, giving unusual access to imagination, creativity, visualisation and problem solving.

- It allows remarkable "superlearning", verified and used by many universities and schools mainly in the USA. Tape recorded and video information is accurately assimilated.

- Two hours of floating are more restorative than a full night of sound sleep and the deepest rest ever experienced is attained.
- Athletes improve performance using flotation.

- Floating quickly reduces smoking and drug use and counteracts withdrawal symptoms (by raising endorphin production).

- Floating is effective if weight loss is desired and its effect lasts for months after floating.

- Dogmatic attitudes and beliefs are realised for what they are, while floating. Unreasonable resistance to new ideas is thus weakened - a very beneficial effect.

Remote Viewing should become possible for most people in the flotation tank but much practice is essential to avoid interference from one's own preconceived ideas about an event. Although not requiring a flotation tank, the gifted CIA Remote Viewers were able to go back in time to repeatedly view ("replay") the Pan-Am aircraft which crashed at Lockerbie, just before the bomb exploded, to discover exactly where the explosion originated in the aircraft's baggage hold. Similarly, Besant & Leadbeater used Remote Viewing to view atoms & molecules at very high maginfication [115].

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There are many websites on flotation tanks, including those in which time can be hired, but be aware that the quality may vary greatly for those tanks. Some tanks do not have the total blackness facility. It is essential to have **all** five senses receiving zero inputs, if the normally subliminal higher senses are to be perceived. This can take years by normal meditation techniques. Normal (everyday life) inputs to the 5 senses drown out the much smaller inputs to the higher senses. Depriving the normal 5 senses of <u>all</u> input allows the very faint subliminal 6th sense to be perceived.

<u>Additional:</u>

To attain higher states of consciousness also requires perseverance and single-mindedness and rejection of any feelings of selfishness. Absence of anger, hatred, desire, and delusion are essential. Many others have achieved this. Concentration is a valuable faculty and the exercises in ref [a] below are highly recommended. The meditation subject must then be chosen, a simple example being just God in the abstract. Using the practice of concentration achieved by these exercises, a determined effort must be made to raise one's consciousness and merge with the subject chosen. Persevere -- others have succeeded in doing it. See references [b] & [c] below.

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A Final Comment:

As everyone eventually has to leave the 3-D physical world, it seems common sense to explore the next 4-D world, just as we might look at travel guides for any destination before going there for a holiday! It seems very strange to the author that very few people consider doing this! Two important quick methods are: the flotation tank, and, lucid dreaming herbal supplements. On the latter, it is **essential** to see the highly recommended reference cited at the start of this Chapter. Important: See also: http://dreamstudies.org and:
http://dreamstudies.org/galantamine-review-lucid-dreaming-pill/
http://www.dreamviews.com

See ref. [137] for **essential** details not in this present book.

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"Phosphenism - the art of visualization" by Dr F.Lefebure [English translation]
"Developing clairvoyance by phosphenism" by Dr F.Lefebure
"L'exploration du cerveau par les oscillations des phosphenes doubles (phosphenisme)" by Dr F.Lefebure (Editions Jacques Bersez, Paris, 1982)
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Note: Light & Sound machines, flotation tanks, etc can be obtained from**:** www.toolsforwellness.com
This is given for information only. The author has no connection with this firm, but has found it reliable.
Many other suppliers exist; a low-cost "DIY" flotation tank construction booklet is available from: Design Mobility Inc, 280 Nevins Street, Brooklyn, NY 11217, USA. The author (MGH) can give advice on request: to contact, see www.4-D.org.uk/Books

NOTICE & DISCLAIMER: For legal reasons we make the following statements. The items described in the book are experimental consciousness-enhancing products, for which no medical or safety claims are made or implied. The descriptions given for each product are reports of the effects produced as given by the manufacturers and by professional users. None of these statements by professionals should be construed as medical claims. The claims made centre around relaxation, meditation, hypnosis and learning.

Warning: Light & sound and CES units should not be used by persons with a history of epilepsy or other neurological disorders. But the following finding is quoted, for information, from Maxwell Cade & Coxhead [5]: "After 4 years use of the lights, with more than 4000 pupils including 25 known epileptics, there have been no mishaps, and most of the epileptics have reported a marked improvement in their condition. ...subjects were only exposed to the lights after they had become very relaxed..." (see page 49 in reference 5 for more details). This is quoted for information only and our advice is that medical advice should be obtained before proceeding in such cases.
Note: Epilepsy is not very common, but it is possible for someone to be an as-yet undiagnosed epileptic.

The author followed the following advice, which is copied here for information only. It is **not** a recommendation for anyone else to repeat anything related to flashing lights etc described in this book: *It is essential to allow at least half an hour after using light and sound machines and other mind-enhancing units and tapes before operating machinery or driving a car.*

Feel the chair and floor beneath you, get up and walk around and have something to eat and drink. Eating and drinking is the quickest and safest way to close down the doorways to the imagination or to unknown "inner worlds" after an inner exploration.

No responsibility is accepted for any use of light & sound machines, nor if any of the above information is used.

This book contains descriptions of what the **author** did and experienced.
No responsibility is accepted for any adverse effects.

CHAPTER 11

OTHER MACHINES

Some other machines have been reviewed (2). To mention a few, there is the TENS unit which gives very low voltage and current stimulation to the ankles at about 8 Hz, reported to produce interesting perceptual results; the Graham potentializer is more complex but again is reported to give very interesting effects.

Cranial Electrical Stimulator (CES)

This is a remarkable electronic unit.

Although there have been no reported problems or significant side effects, these units are not recommended for people with epilepsy, persons with heart trouble or pacemakers, or persons who have had a recent stroke.

Cranial Electrical Stimulation (CES) was developed in the USSR in the late 1940s and has been widely used. Research shows that CES produces a mild stimulation of the hypothalamic area of the brain, balancing neurotransmitter activity, in particular beta endorphin & norepinephrine. The effects are like the so called "jogger's high"; habitual joggers experience a slightly euphoric state due to endorphin production and experience 'withdrawal' symptoms if they miss jogging sessions. A CES machine can remove these withdrawal symptoms, and, can also remove withdrawal symptoms experienced by drug abuse. CES is a powerful way for treatment of drug abuse. Narcotic drugs replace the body's natural opiates (endorphins) and the body stops making them, and if the drugs are then stopped the body still doesn't make them and the user gets the awful withdrawal symptoms which we normally do not experience because we have our natural 'opiates' in our systems to protect us from such an effect. If we had no natural endorphins, we would all have awful 'withdrawal symptoms' all the time!

Use of CES devices may cause interesting occurrences of vivid dreams**;** see the section further below on the Dream Machine for some explanation.

High quality CES devices use a 3-wire output, which gives dual frequency capability, producing two simultaneous brainwave states. Some units may use only two wires and can thus apparently only give one frequency.

Two independently settable frequencies will also give a third frequency by interference or beat.
Fortuitously, beta minus alpha = theta (e.g. 17 - 11 = 6).

CES units are very simple to use**:** the stimulus pads are connected to the ear lobes and back of neck. Very low currents are used, in the microamp region (cf the milliamps of the TENS machines used routinely medically for intract-

able pain relief). Battery operation is essential for complete electrical safety**:** no mains connections.

CES units enhance endorphin production which assists in reaching deep levels of relaxation.

Neuroscientific studies have shown dramatic improvements in the following areas:
deep relaxation, improved memory, mental clarity, improved learning, mood elevation, sound sleep, increased vitality, increased concentration, reduction of psychosomatic conditions, alternative to addictive substances.

Some CES units can be synchronised with the flickering lights of light & sound machines.

A remarkable well-established machine called the Braintuner, is a cranial electrical stimulator (CES) which simultaneously generates 256 different beneficial frequencies applied conveniently to the earlobes (similarly to the above unit). Based on previous machines going back several decades, this unit is a major advance in CES. Its uses include placing the user at the alpha/theta border (Schumann frequency, 7.83 Hz, matching the Earth's electromagnetic resonance frequency), gaining insight, remarkably effective release from drug addiction, TENS-type pain relief usages (relieving intractable pain - on medical advice to do so, of course), insomnia relief, etc..

CES units allow the user to quickly learn how to get into advanced meditation states (compare 10 years by conventional meditation methods).

They promote brain hemisphere balance, between logical and intuitive abilities. This balance can improve communicative skills and creative thinking. Out-of-the-body experiences and other psychic effects have been reported by users. Many users report reduced sleep requirement, about 2 hours per night less than before use. Excellent results are reported when used with language audio recordings, etc.

The pulse wave is advantageously buffered with a complex waveform to make it more effective. Frequency is user variable usually from about 0.5 to 14 Hz. The intensity is adjustable usually from 5 to 50 microamps, well below the limits set by the FDA (USA).

CES units can benefit**:**
students who wish to improve concentration,
musicians and artists who want to enhance creativity,
business people who wish to reduce stress & improve managerial skills,
meditation students who want to enter advanced states of consciousness,
athletes who want to enhance mental strength, improving performance,
psychotherapists,
and anyone who wishes to explore their mind and approach life in a relaxed way.

They can be used with language audio recordings, meditation audio recordings, subliminal audio recordings, and music. They enhance mental

and physical relaxation and so allow self-improvement regimes to work more effectively.

CES units intended for the medical treatment of anxiety, depression & drug addiction usually operate at a fixed frequency of 100 Hz and so will not interrupt normal activities and can be used while reading, typing, etc. (It should not be used while operating machinery). It is reported to release endorphins and to have the consequent beneficial effects.

Budzynski (133) has published a review on CES and Beck (134) has given a list of published papers on CES.

tACS devices

When sinusoidal 40 Hz transcranial alternating current stimulation (tACS) is applied to the brain, lucid dreams are reported, for a subject who is asleep and in a normal dreaming state. I.e. the subject moves from the status of a conscious but passive observer (the normal dream-state), to that of a self-conscious participator in the dream (a 'lucid dreamer'). This is discussed in Chapter A (ii) in this book.

Ganzfeld Units

First discovered in the 1930s by psychologists, a featureless uniform white or coloured (but not black) visual field can cause the brain to "shift gear" into profound meditation states. Ganzfeld is german for "entire field" (of view).

A ganzfeld unit presents a steady (non-pulsing), luminous but featureless visual field to the eyes, which causes relaxation, gives stress relief and brings forward imagery which is normally blotted out by the wealth and variety of all the normal objects which we see in any room. Removing all such normal objects causes the brain to "turn up the gain control" (analogous to brightness control on a TV) which allows normally-too-faint images to appear. If random noise is gently played through earphones, the effect is enhanced. Merely closing the eyes (featureless dark field) does not produce these results.

Gazing into a ganzfeld, the mind eventually 'blanks out'; you do not see blankness but instead lose the sensation of having eyes at all. One's attention then turns within and deeply relaxed meditative states are entered.

The Ganzfeld effect has been discussed in Chapter 10.

Dream Machines

You can enjoy the power of being awake and aware in your dreams!

These remarkable units answer the wishes of people for centuries - a way of entering their dreams with self-conscious awareness and taking part in them (called lucid dreams). This extends your conscious time from day into the night and many useful experiences can be gained which have a direct

bearing on one's everyday life. Up till recently, this possibility was only "in the compass of a dream...", but is now a reality! In dreaming sleep, rapid eye movements (REM) occur (81) and by using a sensitive electronic sensor this event can by sent to a microprocessor unit which then sends a train of low-level flashes to a subminiature lamp set into a light-shield worn by the sleeper. The light-shield is similar to those which airlines give out on night flights, for passengers who want to sleep in a lit cabin. When the unit detects REM, indicating dreaming sleep, and responds thus, the dreamer sees the dream light up, or some other event occurs, like bright jewels suddenly appearing. The effect of this is to trigger the memory of having set up the experiment to become aware and self-conscious in the dream! At that instant the dream suddenly becomes much more vivid or lucid and one can take conscious part in directing it. It forms a remarkable experience.

You can find out how it feels to fly, to climb the highest mountain, to visit exotic lands; you can use lucid dreaming to help you make your dreams come true in real-life. Throughout history, dreams have inspired many great new ideas and inventions. With lucid dreaming you can go directly to the source of inspiration within your unconscious mind to stimulate ideas and solve problems.

Lucid dreams are so real that you can use them to practice and improve skills. Lucid dreamers have thus developed their techniques in sports, dancing, music, speaking, mathematics, science, surgery, computer programming, etc. etc. Fears can be overcome. Your conscious and unconscious minds can be brought together which helps you to grow psychologically. Lucid dreaming is especially valuable for those interested in dreams as a path to self-knowledge.

Because of the complexity of design of a unit which will reliably perform this function without needing continual adjustments, the price of these units is unavoidably high. But the value for money is there. The units are the product of years of dream research at various institutes. They have been well tested by many people with great success.

Normally, people have about 5 or more dreams in an 8-hour sleep period, but forget most of them on waking. One is not normally aware or self-conscious in dreams because the brain is not in a beta brainwave-producing state. For some awareness, some beta waves must be produced, along with the predominantly theta waves of the dream state. This is the function of these units.

Some more details were given earlier, at the end of Chapter 9, and, especially see Chapter A (i).

Low cost Dream Machine:

See Chapter A (i) for the author's recently developed self-build circuit and the detailed instructions used by him. Caution: See the very last paragraph of this e-book.

CONCLUSIONS

It may be significant that some of the techniques described in this book are very simple and can be performed with readily available equipment that is easy to use. But see the very last paragraph in this book.

Some techniques have been accepted by major organisations in the USA and Europe, and a new era is expanding where subconscious enhancement and the ability to tap into our inner being is beginning.

Many of the electronic units and other devices, such as flotation tanks, are available from internet suppliers. Chapters A (i) & A (ii), in this book, gives very low cost free simple circuit diagrams for lucid dream devices and for rapid visual-image-producing devices. But see the very last para. in this book.

With the help of these new electronic units we can all at least aspire towards becoming Einsteins or to writing rhymes of ancient mariners, or composing music and painting masterpieces, or producing inspired films and videos: Tolkein's 'Middle Earth', Lewis Carrol's 'looking glass', C.S.Lewis's 'Narnia', the 'Fantasia' of The Neverending Story and the magical world of A Flight of Dragons (26). None (and all!) of these are "children's videos"!

A final important comment:
Students of meditation ask how to get over the initial barrier to progress --- Buddha said: "*Look within, every man is Buddha already*", and, "*Seek your own salvation diligently -- even Buddhas can only point the Way*", but the ***method*** for "looking within" is not clearly specified in texts, and is a barrier to progress. The method given in Chapter A(ii) is a contribution to this problem and the author is puzzled by where the visions are located! They are clearly not in the normal physical world, but in a dream-world, but are very real-looking indeed -- in another spatial dimension? It is a first step and perhaps pathworking (Chapter 9) is one way forward.

Concentration - Meditation - Contemplation
Dharana - Dhyana - Samadhi

IMPORTANT NOTE**:**

References for Chapters A (i) & A (ii) and B, are listed after those chapters, not here.

After the list of numbered references below, there is a General Bibliography.

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“Exhale”, by G. Minett, publ by Floris Books, Edinburgh (2004) (**Holotropic breathing**, overbreathing). Note:
For **Pranayama** breathing exercises, see:
Swami Vivekananda, "Raja Yoga", publ Bharatiya Kala Prakashan, or others (same text) (first publ about 1880). Note: does not warn against excessive use of pranayama (breath control). And:
Monks of the RamaKrishna Order, "Meditation", publ RamaKrishna Vedanta Centre, London (1972). **Highly recommended.**
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Magnetic stimulation: See website: www.shaktitechnology.com
Reza Jalinous, "A Guide to Magnetic Stimulation": available from www.magstim.com An excellent review article. See also "Brainsight" ™
If not accessible, contact: www.4-D.org.uk/Books
Lucid dreaming: A simple method [P. Whelan,May 2010.], needing no equipment, is to look at one's hands very frequently throughout the day and try to make them disappear, as a test of whether one is awake or dreaming. If this simple test is made habitual by being done very frequently during the day, it will automatically be continued during dreams and then one's hands will disappear and this will trigger a realisation that one is dreaming, and at that moment the dream should become lucid (self-consciousness will occur). The dream can then be consciously directed. Another similar daytime exercise is to continually ask if one is dreaming or not

(look away and back again and see if the scene has changed -- if it has, you are dreaming!).
Other such trigger methods are in the books on lucid dreaming by S. LaBerge (Lucidity Institute).
C.H. Dechanet, “Christian Yoga”, publ by Burns & Oates (1960); & others.
G.K. Khalsa et al, “Kundalini Rising”, publ. Sounds True Inc, Boulder, CO, USA (2009). See also:
G.L. Paulson, “Kundalini & the Chakras”, publ. Llewelyn, Woodbury Publs, MN, USA.
Yram, “Practical Astral Projection”, publ. S. Weiser, New York (1979).
Joan Grant, “Winged Pharaoh”, Ariel Press, Columbus, OH, USA: **Recommended.**
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Targ et al, **Nature** 251, 602 (1974).

Remote Viewing DVDs:

Three DVDs of remote viewing: (1) “The Real X-Files”, Channel 4 TV (UK), Presenter: J. Schnabel, Director: B. Eagles, Producer: A. Graham, “Wallto-Wall TV Productions for Channel 4” (interviews with CIA) (1995); (2) “Strange but True”, LWTV programme for ITV (UK), Presenter: M. Aspel, Producer & Director: N. Miller (interviews with Dr D. Morehouse – see also: (3) Ingo Swann, Remote Viewing Conference 2006 (Intl Remote Viewing Assoc): DVD available from www.irva.org

Remote viewing books:

Remote Viewing Secrets: A Handbook by Joseph McMoneagle (Paperback -- July 2000).
The Seventh Sense: The Secrets of Remote Viewing as Told by a "Psychic Spy" for the U.S. Military by Lyn Buchanan (Paperback - 1 Dec 2003).
Limitless Mind: A Guide to Remote Viewing by Russell Targ (Paperback -- 3 Mar 2004).
Remote Viewing: The Complete User's Manual for Coordinate Remote Viewing by David A. Morehouse (Hardcover - 8 Jan 2008).
Mind Trek: Exploring Consciousness, Time, and Space Through REMOTE VIEWING by Joseph McMoneagle (Paperback - Nov 1995).
Psychic Warrior: True Story of the CIA's Paranormal Espionage Programme by David Morehouse (Paperback - 17 April 2000).
Remote Viewing: What it is, Who Uses it and How to Do it by Tim Rifat (Paperback - 11 Oct 2001).
Memoirs of a Psychic Spy: The Remarkable Life of US Government

Remote Viewer 001 by Joseph McMoneagle (Paperback - 31 July 2006).
Susan MacWilliam: Remote Viewing by Karen Downey, Ciaran Carson, Brian Dillon, and Slavka Sverakova (Paperback - 1 May 2009).
Remote Viewing: v. 5: The ESP Series by Tom Stevens (Paperback – 4 Mar 2009).
Remote Viewing Training Course by David Morehouse (Audio CD – Sep 2004).
Remote Perceptions: Out-of-body Experiences, Remote Viewing and Other Normal Abilities by Angela Thompson Smith (Paperback - Oct 1998).
Remote Viewing: History and Science of Psychic Warfare and Spying by Tim Rifat (Hardcover - 27 July 1999).
Remote Viewing and Sensing for Managers: How to Use Military Psiops for a Competitive Edge by Tim Rifat (Paperback - 17 July 2003).
Beyond Einstein's Horizon: Science, Remote Viewing and ESP by Ken Renshaw (Paperback - May 2009).
Remote Viewing: The Science and Theory of Nonphysical Perception by Courtney Brown (Hardcover - 28 Mar 2005).
Remote Viewing: A Theoretical Investigation of the State of the Art by Marilyn Isabelle Schmidt (Paperback - 15 May 2007).
Tracks in the Psychic Wilderness: An Exploration of Remote Viewing, ESP, Precognitive Dreaming and Synchronicity by Dale E. Graff (Paperback - 4 Jun 1998).
Remote Viewing - das Lehrbuch 1.: Technik des Hellsehens. Teil 1: Stufe 1-3 by Manfred Jelinski (Paperback - 31 Dec 2001).
Geheimnisse des Remote Viewing.: Auf der Spur der Matrix by Frank Köstler (Paperback - 30 Sep 2002).
Schritte in die Zukunft: Remote Viewing und die Gesetze der Veränderung by Manfred Jelinski (Paperback - 31 Dec 2002).
Remote Viewing - das Lehrbuch Teil 2: Technik des Hellsehens Teil 2: Stufe 4+5 by Manfred Jelinski (Perfect Paperback - Jan 2008).
Multidimensional Mind: Remote Viewing & the Evolution of Intelligence by Jean Millay (Paperback - 31 July 1999).
Remote Viewing: The Science and Theory of Nonphysical Perception by Courtney Brown (Paperback - 28 Mar 2005).
Cosmic Explorers: Scientific Remote Viewing, Extraterrestrials and a Message for Mankind by Courtenay Brown (Hardcover - Jun 1999).
Tracks in the Psychic Wilderness: An Exploration of Remote Viewing, ESP, Precognitive Dreaming and Synchronicity by Edgar Mitchell and Dale E. Graff (Hardcover - Oct 1998).
Time Traveller/Remote Viewing by Barrie Konicov (Audio Cassette – Nov 1985).

Remote Viewing: Invented Worlds in Recent Painting and Drawing by E. Sussman, Caroline A. Jones, and Katy Siegel (Hardcover - 28 Oct 2005).
J. Schnabel, "Remote Viewers". A TV documentary was also produced.

NOTE: The above list is very incomplete! There are many other very good books, not listed here.

MUSIC – CD list

Some readers may like a list of CDs which have an uplifting effect. The list below is of course very incomplete, but a **** recommendation is given:

********* "Dorje Ling", D. Parsons, Fortuna 17076-2; Tracks 1 & 4 (must be heard with eyes closed). Deep bass & infrasound produce devotional feelings (Note: some mediaeval cathedral organ pipes are in the infrasound acoustic frequency range!).
******"Vespers … 1610", Monteverdi, Apex 2564 61429-2; track 10.
******"Parsifal", Wagner, Conducted by Barenboim, Berlin Phil, very good slow version, Teldec 4509-97910-2.
******"Gloria", Vivaldi, very best version is film music LP record of "Runaway Train", available on internet, Enigma Records, Capitol Records – EMI Inc, SJ 73200.
*****"Pilgrim's Progress", Vaughan Williams, EMI CMS 7 642122; Act 4 Scene 3.
*****"Spem in Allium", Thomas Tallis, (best version) Gimell CDGIM 006.
****"The Encircled Sea", Boyle, Silva Screen Film CD 076; tracks 8, 12.
****"Faust Cantata", Schnittke, Malmo S.O., BIS-CD-437; tracks 9, 10.
****"Miserere", Allegri (very special version) Ambionay Naïve E 8846: www.naïve.fr
****"Responsories for Tenebrae", Victoria, Decca CD 425-078-2.
****"Gathering of Spirits", R. Fox, FX Music FXCD4; track 3.
***"Gotterdammerung", Wagner, Cond. Solti, Decca 455 569-2; Act 3, track 11.
***"Koyaanisqatsi", P. Glass, Island Masters IMCD 98 (814042-2)
*** Organum – Compostella (chanting), Ambroisie 3 760020 170660; tracks 1, 8, 11.
***"La Poeme Harmonique", Boesset, Alpha 057, track 20 (Nos Spirites Libres).
**"Atlantic Realm", Clannad, BBC CD 727. And other Clannad CDs.
**"Akenaten", P. Glass,
**"Turn of the Tides", Tangerine Dream, Miramar CD 09006-23088-2.
**Angelic music (various CDs) by Iasos (reported by NDE people as nearest to what they heard during an NDE!)

See also the book: N. Drury, "Music for Inner Space", Prism Press, UK (1985). **Highly recommended.**

For those who want to compose music but have difficulty in writing it down, a programme called Akoff Music Composer, which converts one's humming or whistling a tune into music (e.g. violin, + notation), is available at: www.akoff.com

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Warning: Light & sound and CES units should not be used by persons with a history of epilepsy or other neurological disorders. But the following finding is quoted, for information, from Maxwell Cade & Coxhead (5): "After 4 years use of the lights, with more than 4000 pupils including 25 known epileptics, there have been no mishaps, and most of the epileptics have reported a marked improvement in their condition. ...subjects were only exposed to the lights after they had become very relaxed..." (see page 49 in reference 5 for more details). This is quoted for information only and our advice is that medical advice should be obtained before proceeding in such cases.
Note: Although epilepsy is not very common, it is possible to be an un-diagnosed epileptic, with a seizure triggered off by flashing lights.

Additional**:** The author allowed a minimum of half an hour after using light and sound machines and other mind-enhancing units and audio recordings before operating machinery or driving a car.
It was important to feel the chair and floor beneath one, to get up and walk around and have something to eat and drink. Eating and drinking is the quickest and safest way to close down the doorways to the imagination or to unknown "inner worlds" after an inner exploration.
The author accepts no responsibility for any consequences for use of Light and Sound devices.
This book describes the author's experiences and is not a recommendation for anyone to use such devices.

COLLECTED PROCEDURES USED IN THE AUTHOR'S EXPERIMENTS:

For ease of reference, the various procedures given in the above pages are collected here:

NOTE: These instructions/procedures were written by the author for his own use, and their appearance in this e-book is **not** a recommendation for them to be used by anyone else. Caution: See the very last paragraph of this e-book. This book is an account of what the author did, following the scholarly normal practice of recording all results obtained in a set of experiments. It is **not** a recommendation for anyone to copy anything described in this e-book.
See the "Warnings" section at the end of the previous page above.

From Fig. 1.2:

Start: **10** Hz flashes to both L & R eyes, and 10 Hz tones to L & R ears.
The ovals are top views or "plan views" of the head, at the times shown.
Ramp (automatic) to reach **18** Hz (Beta) flashes to L eye, & 18 Hz sound tones to R ear, and,
6 Hz (Theta) to R eye & L ear, at 9 minutes. (No need for user to measure 9 minutes as it is obvious from the lights & sounds that they have become constant after 9 minutes).
Remove right earphone (18 Hz, Beta) at 10 minutes.
Rotate left potentiometer to zero to stop flashes to left eye (18 Hz, Beta) at 10 or 11 minutes.
Remove left earphone (6 Hz, Theta) at 12 minutes.
{Optional Experiments: After about another 2 minutes, very slowly reduce the R brightness. After a further 5 minutes, reduce right brightness further, but if the vision is lost, increase it.
Later, raising to maximum brightness will produce more-vivid images**.}**
Hold for 30 to 50 minutes (optional session length).
Important: Eyes MUST be kept closed at all times, (for safety reasons).
Important: Appendix 7 gives important "Troubleshooting" hints.
Appendix 6 gives essential instructions on using an MP3 audio player.

Note: Flashes and sounds are partly crossed-over within the brain, to the hemispheres, but the above instructions can be reversed (in a new session) to send the 18 Hz flashes to the other eye, also of course changing over the left & right sound inputs, to give an improved result, after a week's use of the first version. This alternation of the active eye is advantageous.

Miscellaneous Technical Instructions & Notes for Use:

For the **essential** main instructions with diagram: see Fig. 1.2 in Chapter A(ii).
Caution: See the very last paragraph of this e-book.

It is not necessary to have a computer available while using the flashing lights unit, because the output of the USB Audio Device can be copied to any recording device, such as a CD or MP3 player, a tape recorder, or any miniature sold-state recording/replaying device, whose output 3.5 mm jack socket can then be used to plug the 3.5 mm plug-to-plug cable into, with the other end being plugged into the flasher unit's input. The playing device's volume control will need to be adjusted, to get suitable amplitude square

waves from it. For the Sansa MP3 player, shown in the picture of the final unit (Fig. 7), its half-volume is ok. To find the best level, the MP3 player's volume control was reduced until the bulbs stop flashing, and then increased to about halfway between that value and the maximum. The setting was noted. A suitable low cost MP3 player is Maxell, P-Series, see www.maxell.eu **See details in Appendix 6, for this alternative MP3 player.**

Main electronic unit:
Power supply unit ("battery eliminator"): Set the voltage on it **before** switching it on (it will **not** respond to changes made after switch-on). Set it to 6 volts to power the circuit board. If the bulbs burn out, they are very low cost and easily replaced. All the transistors are in sockets, not soldered in, for easy replacement.

Very Important: It was made **sure** that the two 3.5 mm stereo-type plugs were firmly clicked **fully** into their **correct** sockets (labelled), which may be very stiff.

Note: The earphones' sound volume was set "moderately loud" for effective brainwave entrainment, but **not** "very loud". Recall the caution that earphone and MP3 player manufacturers put in their instructions leaflets – that excessive loudness can cause permanent hearing loss in later life.
Note: In use, the two **brightness** control potentiometers should be set at maximum, just before putting the spectacles on, to get the bulbs about **equally bright**. The brainwave entrainment is more effective if the bulbs are **bright**. But if too bright, the flashing may intrude. Try 7.5 volt supply volts.

After the visions are observed, at about 10 minutes, with the left bulb turned off (i.e. left potentiometer turned fully anticlockwise), the right potentiometer can then be reduced slightly (only about 10 to15 degrees of rotation) to further reduce the distraction of the flashing, but too much reduction will cause the brainwave state to be lost, but it can be recovered by turning the flashes brighter again (without delay).
The flashing should quite soon become habituated to, and then appear as a slight flickering only. Surprisingly, after the trees or other vision has been observed for several minutes and if one is relaxed, then if the right bulb is turned fully bright (potentiometer turned fully clockwise), the images become more vivid and the flashing is not a distraction. Experimentation is necessary.

If extraneous thoughts occur, the flashing habituation will cease and the field of vision will be blocked out by a red field of flashing light. The trees are "behind" this light and if the mind is cleared of thoughts, the flashing will be re-habituated and it will then diminish and the trees will re-appear, within usually 10 or 20 seconds. This effect is repeatable. With practice, it should be possible to do simple arithmetical calculations without losing the trees' vision. This effect is very similar to a ticking clock in a quiet room, which the mind habituates to, so that no ticking is sensed, but if one thinks of the clock then its ticking will be heard again because the mind's habituation to it is lost.

Other experiments (not yet done) would be to change the flashing mark:space ratio, i.e. the ratio of on-time to off-time for each flash.

Note: It is essential to wait 2 minutes before assessing the success of the settings, if the flashing seems too bright and blocks out the images, because the eyes/brain will habituate to any repetitive stimulus like regular flashing, and it will recede, leaving the images to be seen. A good familiar example is the ticking of a new clock in a room, which is quite distracting at first, but after some time becomes quite inaudible and is not distracting at all. The same applies to flashing lights and time must be allowed for habituation to occur before assessing the imagery situation.

Note: Very different degrees of success may be obtained on different days, depending greatly on one's relaxation state. A week of results with good images may be followed by weak images, but good images will be obtained again later, due typically to one's mind state – e.g. stress or worry can cause a period of weak imagery. Patience is necessary.
The order of switching on, does not matter, electronically, but is best to switch on the square wave from the computer (or preferably from a recording of it on an MP3 player) last, by using the "pause" button on the MP3 player, to avoid loss of the start of the programme. For the same reason, the 6 volt LES bulb brightness was set to maximum before starting the MP3 player, and was thus set to be of equal brightness before putting the spectacles on.
Note: It may take about 30 seconds for the bulbs to start flashing and 30 seconds for the sound pulses to settle down steadily.
Circuits have been tested and the diagrams checked, but please report any errors found, to the author: mgh@4-D.org.uk
Please report any results and problems.
The author will endeavour to reply to any questions.

See also Appendices 6 & 7.

CAUTION:

When using Light & Sound devices:
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Warning:

Light & sound and CES units should not be used by persons with a history of epilepsy or other neurological disorders. But the following finding is quoted, for information, from Maxwell Cade & Coxhead [2]: "After 4 years use of the lights, with more than 4000 pupils including 25 known epileptics, there have been no mishaps, and most of the epileptics have reported a marked improvement in their condition. ... subjects were only exposed to the lights after they had become very relaxed ..." (see page 49 loc cit for more details). This is quoted for information only and our advice is that medical advice should be obtained before proceeding in such cases.

Note: Epilepsy is not very common, but it is possible for someone to be an as-yet un-diagnosed epileptic.

The author followed the advice below, which is copied here for information only. It is not a recommendation for anyone else to repeat anything related to flashing lights &c described in this book:
It is essential to allow at least half an hour after using light and sound machines or devices and other mind-enhancing units and audio CDs & tapes before operating machinery or driving a car.
Feel the chair and floor beneath you, get up and walk around and have something to eat and drink. Eating and drinking is the quickest and safest way to close down the doorways to the imagination or to unknown "inner worlds" after an inner exploration.
No responsibility is accepted for any use of light & sound machines or devices.

In writing this book, the author is following the long-established tradition of the reporting of experimental results which the author has found.
In some places where the text appears to be giving "instructions", these were written for the author and a colleague during testing, and must not be construed as being instructions for others to follow.
No responsibility is accepted if any of the above information is copied or used by anyone else.